State Highway 45 Southwest

From Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626
Travis and Hays Counties, Texas
CSJ: 1200-06-004 & 1200-07-001

Final
Environmental Impact Statement

Texas Department of Transportation
Austin District

January 2015

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CSJ: 1200-06-04 & 1200-07-001

FINAL ENVIRONMENTAL IMPACT STATEMENT

SUBMITTED PURSUANT TO 43 TEXAS ADMINISTRATIVE CODE CHAPTER 2

BY THE

TEXAS DEPARTMENT OF TRANSPORTATION

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Date of Approval

Texas Department of Transportation

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EXECUTIVE SUMMARY

This document represents the Final Environmental Impact Statement (FEIS) for the State Highway 45 Southwest (SH 45SW) project. This document was completed after analysis of the public and agency comments received on the Draft Environmental Impact Statement (DEIS) published in June 2014. As a response to public and agency comments, the following changes were made to the proposed project and are incorporated into the FEIS:

- Realignment of the roadway to avoid and minimize impacts to sensitive karst features in the right-of-way (ROW);
- Reconfiguration of the MoPac-SH 45SW interchange to increase safety; and
- New location for connection with the proposed Violet Crown Trail resulting from coordination with the City of Austin and Hill Country Conservancy.

More information on these changes and the identification of the Build Alternative as the Preferred Alternative is located in **Section ES.4** in the Executive Summary, and **Section 5.0** in the FEIS.

ES.1 LEAD AGENCIES AND PARTICIPATING AGENCIES

The Texas Department of Transportation (TxDOT) and Central Texas Regional Mobility Authority (Mobility Authority) are the lead agencies on the proposed State Highway 45 Southwest (SH 45SW) project (hereafter referred to as "proposed project"). The following agencies have agreed to be Participating Agencies in the process:

- Barton Springs/Edwards Aquifer Conservation District
- Capital Metropolitan Transportation Authority
- City of Austin
- Hays County
- Texas Historical Commission
- Texas Parks and Wildlife Department
- Tonkawa Tribe of Oklahoma
- Travis County
- U.S. Fish and Wildlife Service

ES.2 SUMMARY OF THE ACTION

This FEIS evaluates the environmental, social, and economic impacts potentially resulting from the proposed construction of State Highway 45 Southwest (SH 45SW). The proposed, non-federally funded project is being developed by TxDOT in conjunction with the Mobility Authority. The limits of the proposed project would extend from State Loop 1 (locally

known as MoPac) in southern Travis County to Farm-to-Market Road (FM) 1626 in northern Hays County, Texas (**Figure ES-1**). The proposed new location, four-lane, limited access tolled facility would be approximately four miles long and is identified in the current Capital Area Metropolitan Planning Organization (CAMPO) *2035 Regional Transportation Plan* (*RTP*). A shared use path would parallel the entire roadway. The width of the ROW varies from approximately 300 to 600 feet. The purpose of the proposed action is to improve system connectivity, local mobility, and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis Counties; the proposed action would address the congestion and delays stemming from the lack of efficient, direct routes connecting northern Hays County to Travis County and Austin; and the fact that existing routes within the area are circuitous and require drivers to pass through numerous signalized intersections, contributing to long travel times.

The proposed project will be funded entirely with state and local funds, and therefore the environmental review was carried out following state requirements and state procedures. The instances in this FEIS which refer to requirements in federal law and guidance concerning the preparation of a federal environmental review document are there to show that TxDOT was guided by those materials. However, the ultimate requirements that apply are in state law.

Project History

The proposed project evolved from efforts, begun in the early 1980s, to create a controlled-access highway facility (called the Austin Outer Parkway) circling the city of Austin. The current SH 45SW project is located within the limits of what was previously known as Segment 3 of the Austin Outer Parkway. Although the Austin Outer Parkway is no longer being pursued, the proposed project remains a priority for the community, as evidenced by the proposed project's inclusion in various forms in the Austin area's 2020, 2025, and 2035 regional transportation plans.

Figure ES-1: Proposed Project Limits

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ES.3 PURPOSE AND NEED FOR THE ACTION

The purpose of the proposed action is to improve system connectivity, local mobility, and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties.

The proposed action seeks to address the following conditions (needs): drivers in this area experience traffic congestion and delays stemming from the lack of efficient, direct routes connecting northern Hays County to Travis County and Austin. Existing routes within the area are circuitous and require drivers to pass through numerous signalized intersections, also increasing travel times.

Traffic congestion is exacerbated by the area's booming population growth. Between 1990 and 2010, the population increased 241 percent within the census tracts surrounding the proposed project area (US Census, 1990, 2010). Population within the area is expected to increase by an additional (approximately) 40 percent between 2010 and 2035 (CAMPO, 2010b). There is a direct correlation between population and traffic. Therefore, as the population of the area increases, so too does the volume of traffic on the existing roadway network.

With the population in the area expected to grow, current congestion-related delays on the roadway network can be expected to worsen. Calculations of travel time differences using the CAMPO 2035 travel demand model, adjusted to reflect updated demographic and traffic conditions, indicate that travel times along existing routes in northern Hays and southern Travis counties in 2035 are projected to be 89 to 97 percent longer in the morning and 42 to 90 percent longer in the afternoon, depending on the route taken, than observed travel times in 2014 (**Table ES-1**).

Table ES-1: Travel Time Differences along Existing Local Roadways 2014-2035

Peak Hour	Route	2014 Observed Travel Time (min) (1)	2035 Projected Travel Time (min)(2)	Percentage Increase in Travel Time 2014-2035
AM	FM 1626-Brodie-Slaughter-MoPac	20	39	89%
AM	FM 1626-Manchaca-Slaughter-MoPac	22	44(3)	97%
PM	MoPac-Slaughter-Brodie-FM 1626	19	37	90%
PM	MoPac-Slaughter-Manchaca-FM 1626	29	41	42%

Source: RTG, 2014
(1): A minute of travel time was added to account for the decrease in speed associated with MoPac on and off ramps.
(2): Travel time projections in 2035 for the No Build scenario (without the proposed project)
(3): Travel times adjacent to Menchaca Elementary were increased 25% to account for the reduced speed in the school zone.

By providing an alternative route to these congested local roadways, the proposed project would contribute to improving the overall function of the transportation system in this area. See **Section 1.0** in the FEIS for a more detailed discussion of the proposed project's purpose and need.

ES.4 SUMMARY OF ALTERNATIVES CONSIDERED

No Build Alternative

Under the No Build Alternative, the proposed project would not be constructed; however, this alternative assumes that all other improvements in the CAMPO *2035 RTP* would be constructed. Although it does not meet the proposed project's purpose and need, the No Build Alternative was carried through the environmental impact analysis to assess the impacts of no action.

Preliminary and Reasonable Alternatives

The following preliminary alternatives were evaluated: Transportation System Management (TSM), Travel Demand Management (TDM), the Upgrade One or More Existing Roadways Alternative, the New Tollway on New Location Alternative, the New Tollway on Existing State-Owned ROW Alternative, and the No Build Alternative. These preliminary alternatives were presented at the second public scoping meeting and second agency scoping meeting (December 2013).

Some of the preliminary alternatives listed above were eliminated from further consideration for failing to meet the established purpose and need. Other alternatives would require additional ROW acquisition, which would result in displacements and impacts to City of Austin (COA) Water Quality Protection Lands (WQPLs) – lands protected from development in perpetuity to protect the quality and quantity of water in the Edwards Aquifer. Because other, less intrusive alternatives were available which satisfied the established purpose and need without displacements or impacts to WQPLs, alternatives requiring additional ROW were considered unreasonable and were eliminated from further consideration. The TSM and TDM alternatives were eliminated from further consideration due to their failure to meet the purpose and need of the proposed project. The Upgrade One or More Existing Roadways Alternative and New Tollway on New Location Alternative would result in residential and/or commercial displacements and would directly impact WQPLs. The New Tollway on State-Owned ROW Alternative was the only alternative that was both reasonable and met the purpose and need of the proposed project. Additionally, because the New Tollway on State-Owned ROW Alternative would be constructed on land already owned by TxDOT and designated for transportation use, this alternative would not require the purchase of additional ROW, making it less expensive.

COA staff, at the request of City Council, reviewed alternative transportation investments to SH 45SW, including interchange improvements to Brodie Lane and upgrades to existing local roadways. Staff findings submitted to council in September 2014 conclude that neither roundabout improvements to intersections along Brodie Lane between Slaughter Lane and FM 1626 nor upgrades of existing roadways (Brodie Lane, Slaughter Lane, and Manchaca Road) would be a viable alternative to SH 45SW due to cost, environmental constraints, and displacements caused by ROW acquisition.

The New Tollway on Existing State-Owned ROW Alternative would not result in displacements or impacts to preserved lands and does meet the proposed project's stated purpose and need. Therefore, this alternative was carried forward as a reasonable alternative (the Build Alternative) for further evaluation in the DEIS. Based on the evaluation of existing and preliminary assessments, the DEIS recommended the Build Alternative as the Preferred Alternative. See **Section 2.0** in the FEIS for a detailed analysis of alternatives.

Preferred Alternative

Based on the further analysis of environmental, social, and economic impacts associated with both the Build and No Build Alternatives, and the evaluation of comments from agencies and the public on the DEIS, the potential impacts disclosed in the DEIS did not notably change. Therefore, the Preferred Alternative for the proposed project is the Build Alternative evaluated in the FEIS (see **Section 2.4** and **Section 5.0** in the FEIS). The evaluation of the Build and No Build Alternatives was based on the following criteria:

- Ability to meet the proposed project's purpose and need,
- Effects on the human and natural environments, including
    - Impacts to preserved lands
    - Impacts to neighborhoods
    - Impacts to threatened and endangered species' habitat
    - Projected impacts on mobility

The Build Alternative was identified as the Preferred Alternative as it:

- Satisfies the proposed project's purpose and need,
- Considers the input of citizens and other stakeholders by:
    - Incorporating water quality protection measures that exceed the requirements of the Edwards Aquifer Rules;
    - Reconfiguring the MoPac-SH 45SW interchange to increase safety;
    - Incorporating design elements from the Mobility Authority-sponsored design competition, Green Mobility Challenge, including Permeable Friction Course (PFC) pavement, bio-filtration strips, and innovative interchange design;

- Adding a shared use path along the proposed project's length to accommodate bicyclists and pedestrians;
- Including a new location for the shared use path's connection to the proposed Violet Crown Trail, resulting from coordination with COA and the Hill Country Conservancy;
- Excluding frontage roads throughout the proposed project's length;
- Minimizing direct impacts to karst features by eliminating the center grassy median between MoPac and Bear Creek. This provides a narrower construction footprint and aids in establishing a roadway horizontal alignment that best avoids known karst features; and
- Modifying the alignment evaluated in the DEIS to avoid permanent filling or other direct impacts to the openings of 17 sensitive karst features to the extent practical and to minimize impacts to the Flint Ridge Cave catchment basin from 5.6 acres to approximately 0.7 acre, which would be compensated for by modifications to provide an equivalent area of catchment; and

- Avoids direct impacts to WQPLs, neighborhoods, and public facilities by constructing all improvements within existing state-owned ROW.

ES.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Build Alternative

Under the Build Alternative, direct impacts would stem from the construction and operation of the roadway itself. Direct impacts are analyzed for the area within the Build Alternative's construction footprint, lying within the larger proposed project study area, an approximately 5,327-acre area in southern Travis and northern Hays counties. Indirect impacts associated with induced growth are not anticipated to be significant under the Build Alternative due to the limited access nature of the roadway, the large amount of protected lands in the proposed project's area of influence (AOI – area in which project-related impacts that are removed in time or distance from the proposed project site itself may still occur), and the high rate of growth already occurring in the area (even in the absence of the proposed facility).

Impacts to the Human Environment

Land Use

Direct project-related impacts to land use would not be anticipated to occur under the Build Alternative, as the proposed roadway would be built on pre-existing transportation ROW. While induced growth could occur as an indirect result of the proposed project, the amount of land available for development within the proposed project's AOI is constrained by several factors. Approximately 7,742 acres (19 percent) of the proposed project's AOI is comprised of WQPLs; much of this land parallels the state-owned ROW on which the proposed roadway

would be constructed. These WQPLs have been protected in perpetuity from development. Further, the roadway is proposed to be a limited access facility, with only three points of access along it: the two termini at MoPac and FM 1626 and one interchange at Bliss Spillar Road. No frontage roads would be constructed as part of this proposed project. The lack of frontage roads and the limited number of access points constrain opportunities for potential development immediately adjacent to the roadway. Citing these factors, local planning experts, including respondents from COA and Travis County, indicated in a questionnaire on SH 45SW-related induced growth that the proposed project could be expected to induce development, but that this effect would likely be minimal when considered in the context of the rapid, ongoing growth being experienced in the Austin area as a whole (see **Section 7.3.3** in **Appendix D: *Indirect Impacts Technical Report*** for information on the questionnaire responses). See **Section 3.1** in the FEIS for discussions of existing conditions and direct impacts to land use. See **Appendix D: *Indirect Impacts Technical Report*** for an analysis of potential project-related induced development.

Socioeconomic Resources

The Build Alternative is not anticipated to directly impact community cohesion, as it does not bisect any existing neighborhoods or displace public facilities or resources. Due to a lack of frontage roads and few access points, impacts to travel patterns and access would be focused at the three points of access to the proposed roadway (the termini at MoPac and FM 1626 and an interchange at Bliss Spillar Road). At these points, access to the area transportation network would improve as the proposed roadway is expected to improve connectivity, mobility, travel times, and provide an alternative route to congested local roadways. Additionally, bicycle and pedestrian access would improve in the area under the Build Alternative as a shared use path would be constructed along the length of the proposed project. This shared use path may also connect to the proposed Violet Crown Trail and would connect to FM 1626's wide, bike-accessible shoulders, augmenting bicycle and pedestrian infrastructure in the area.

The Build Alternative is proposed as a tolled roadway. A project-level toll analysis indicates that impacts to environmental justice (EJ) populations would not be expected with the construction of the roadway as the best available information indicates that there are no low-income populations within the study area. Although eight census blocks within the study area are comprised of over 50 percent minority residents, adverse impacts to these populations are not anticipated as the proposed project would not alter existing access to or within these neighborhoods. Further, the proposed project would provide benefits to all residents in the study area alike, including increased mobility and improved travel times on both the tolled roadway and non-tolled existing routes. Economic impacts associated with the Build Alternative largely stem from the tolls required to use the facility. Pending a full financial analysis to set toll rates, the economic impact on drivers of the proposed roadway is estimated to be $600 per year (assuming a toll rate of $0.30/mile and 250 round-trips annually). Under Mobility Authority tolling

policy, emergency and public transit vehicles would not be charged a toll. See **Section 3.2** in the FEIS for discussions of existing conditions and direct impacts to socioeconomic resources as a result of the proposed project.

Air Quality

A quantitative analysis of air quality impacts resulting from the Build Alternative was not completed for this environmental impact analysis as traffic projections for the design year are 34,400 vehicles per day (vpd), well under the 140,000 vpd threshold for a Traffic Air Quality Analysis. The proposed project is located within Travis and Hays counties, which is in an area in attainment or unclassifiable for all national ambient air quality standards (NAAQS), including ozone. Therefore, the transportation conformity rules do not apply.

The Vehicle Miles Traveled (VMT) in the study area estimated for the Build Alternative is 15 percent higher than for the No Build Alternative because the proposed roadway would increase access and improve travel times, attracting trips that would not otherwise occur in the area. This increase in VMT means Mobile Source Air Toxics (MSATs) under the Build Alternative may be higher than the No Build Alternative in the study area. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of the Environmental Protection Agency's (EPA's) national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations. See **Section 3.4** in the FEIS for the qualitative air quality analysis.

Noise

The noise analysis conducted for the proposed project indicates that the Build Alternative would result in traffic noise impacts at seven modeled receivers, all of which are residential. Six of these impacted receivers would experience a substantial increase (greater than 10 decibels) in sound levels. At the seventh receiver, noise levels would exceed established Noise Abatement Criteria (NAC) for residential uses. Given these impacts, a barrier analysis was performed. The results of the barrier analysis indicated that a noise barrier that would achieve the minimum feasible reduction of five A-weighted decibels (dBA) at greater than 50 percent of first row receivers and reduce the noise level at one or more receivers by at least seven dBA would exceed the reasonable, cost-effectiveness criterion of $25,000. For this reason, noise abatement is not proposed. See **Section 3.5** in the FEIS for the results of the noise analysis.

Archeological and Historic Resources

No impacts to National Register of Historic Places (NRHP)-eligible archeological historic resources or non-archeological historic resources are anticipated with the project. Five archeological sites determined ineligible for inclusion in the NRHP or State Antiquities Landmark (SAL) designation have been identified and recorded within the proposed project Area of Potential Effect (APE) under the Build Alternative. This includes the portions of prehistoric and historic site 41TV1051, prehistoric site 41TV1424 that overlaps with the SH 45SW ROW, prehistoric sites 41TV1537 and 41TV1538 within the existing SH 45 ROW, as well as prehistoric site 41TV1540 within the existing SH 45 and MoPac ROWs. The latter three sites (41TV1537, 41TV1538, and 41TV1540) were previously impacted by the construction of existing SH 45 and MoPac. The historic component at 41TV1051 associated with the Ransom and Sarah Williams Farmstead was determined eligible for inclusion in the NRHP and SAL designation; the prehistoric component of the site is not eligible for SAL designation or inclusion in the NRHP. Archival research and data recovery excavations within the SH 45SW ROW were performed in 2009. It was determined that the 2009 mitigation of the part of the farmstead component within the proposed SH 45SW ROW exhausted its research potential and the proposed construction could proceed there without additional investigations. The proposed roadway construction would impact the parts of prehistoric site 41TV1424 that overlap with the SH 45SW ROW. However, site 41TV1424 was recommended ineligible for inclusion in the NRHP or SAL designation in 1989 due to low research potential based on its surficial character and lack of cultural features. Furthermore, a portion of the site within an adjacent transmission line ROW along the east side of the APE was formally determined ineligible for inclusion in the NRHP or SAL designation in 2006 for the same reasons. Sites 41TV1537 and 41TV1538 (within the SH 45 ROW between MoPac and Escarpment Boulevard) were previously recommended ineligible for inclusion in the NRHP or SAL designation due to low research potential based on their surficial character and were removed by the construction of the existing SH 45 and MoPac projects. Site 41TV1540, within the existing SH 45 and MoPac ROWs, was destroyed by the previous construction of these two roadways.

The proposed improvements at Bliss Spillar Road were subjected to archeological survey by TxDOT in 2014 to assess the potential for impacts to archeological resources in that location. Results of this survey indicate that no previously unrecorded archeological sites have been identified, but that one previously recorded site, 41TV1051, is located within this additional proposed project APE. As data recovery excavations at 41TV1051 were concluded in 2009 and TxDOT and THC concurred that construction could commence, no further survey or consultation with THC for this area is required (see **Section 3.9.2**).

No historic buildings or structures have been identified in the proposed project APE; thus, impacts to NRHP-eligible, non-archeological historic resources are not anticipated. See FEIS **Section 3.9** for discussions of existing conditions and direct impacts to archeological

resources and FEIS **Section 3.10** for discussions of existing conditions and direct impacts to historic resources.

Visual and Aesthetic Resources

Five key viewpoints were analyzed to evaluate changes to visual resources resulting from the proposed project. These viewpoints included the proposed project termini at MoPac/SH 45 and at FM 1626, as well as locations at adjacent subdivisions in Shady Hollow Estates and Arrowhead Acres. Although located outside the direct impacts study area, the San Antonio Tower at the Lady Bird Johnson Wildflower Center was also included as a viewpoint in response to public and agency comments. Impacts to the view from the tower at the Wildflower Center were determined to be moderate despite the presence of pre-existing landscape features, including the visibility of the existing Lower Colorado River Authority (LCRA) electrical transmission lines, portions of MoPac, and a residential development. The proposed project's visual impacts were determined to be low at the termini, where existing roadways are prominent landscape features. Impacts at the subdivisions were determined to be moderate due to the existing views of open space from those locations. Based on the visual impacts analysis conducted for the Build Alternative, impacts to visual and aesthetic resources in the study area are anticipated to be low to moderate. See **Section 3.12** in the FEIS for discussions of visual and aesthetic resources and potential project-related impacts.

Impacts to the Natural Environment

Geology and Soils

Impacts to geologic resources as a result of the Build Alternative are anticipated to be minor. Approximately 90 percent of the SH 45SW roadway between MoPac and FM 1626 would be built on fill. Construction activities may expose geologic units encountered during construction to erosion, but erosion would be minimized by using proper techniques and best management practices (BMPs) during construction. Soils could be affected by soil compaction, erosion, or sedimentation, but BMPs would minimize these impacts. No mapped hydric soils are present within the state-owned ROW.

A Geologic Assessment identifying sensitive karst features within the state-owned ROW was conducted for the project (SWCA and Cambrian Environmental, 2014). Karst investigations were conducted within the state-owned ROW for TxDOT in 2007 and 2014. Twenty-seven features were determined by professional geologists to be of karst origin and can be divided into sensitive and non-sensitive categories. The sensitive features include five caves, four sinkholes, and eight solution cavities with the capacity for allowing rapid recharge to the Edwards Aquifer. Some of these features were determined to be fault-related. The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of these sensitive karst features. The surface drainage basins of two sensitive

features (F-55 and F-23 [Hat Sink]) in the state-owned ROW, and Flint Ridge Cave, a sensitive recharge feature whose opening is located approximately 150 feet outside the state-owned ROW, would be directly impacted by the proposed project. Under the Build Alternative, approximately 1.3 percent (approximately 0.7 acre out of approximately 55.5 acres) of the surface catchment basin of Flint Ridge Cave would be covered by impervious surfaces. This represents a decrease of approximately 4.9 acres of impacts due to the alignment adjustments made since the publication of the DEIS. Impacted areas are shown in the ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H** of the FEIS). Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge provided by these features is anticipated. The proposed project would not impact the openings, surface expressions, or surface drainage basins of the fifteen remaining sensitive features.

A Water Pollution Abatement Plan (WPAP) would be prepared for the proposed project and would address potential impacts to water quality and quantity associated with karst features. Approval of the WPAP by the Texas Commission on Environmental Quality (TCEQ) would be required before initiation of project construction. See **Section 3.3** in the FEIS for discussions of existing conditions and potential project-related impacts to geology, soils, and karst features.

Waters of the United States and Wetlands

Waters of the United States (U.S.) present in the state-owned ROW include Danz Creek, Danz Creek Split, Bear Creek, and Little Bear Creek. One additional feature, an isolated livestock pond, extends into the western portion of the state-owned ROW but is not a water of the U.S. because it is not connected to a US Army Corps of Engineers (USACE) jurisdictional stream. No wetlands were observed in the state-owned ROW during field investigations. The proposed roadway design includes bridges that span the jurisdictional waters of the U.S. No discharge of dredged or fill material into waters of the U.S. is anticipated. Therefore, the proposed construction at waters of the U.S. in the state-owned ROW would not require a Section 404 permit under the Clean Water Act (CWA). Waters of the U.S. delineation information is provided in the ***Waters of the U.S. Evaluation Technical Report*** in **Appendix J**. See **Section 3.7** in the FEIS for discussions of existing conditions and potential project-related impacts to surface water resources, including waters of the U.S. and wetlands. See the ***Indirect Impacts Technical Report*** **(Appendix D)** and ***Cumulative Impacts Technical Report*** **(Appendix I)** for discussions of potential indirect and cumulative impacts on surface water resources and water quality.

Water Quality

Within the state-owned ROW, approximately 278 acres lie over the Edwards Aquifer Recharge Zone and roughly 33.6 acres lie over the Transition Zone (an area where a low-permeability confining unit overlies the Edwards Aquifer, and geologic features such as faults and fractures present possible avenues for recharge of surface water to the Edwards Aquifer). Potential consequences of the proposed project on Edwards Aquifer groundwater quality and quantity would be negligible because of the limited scale of the project since the 48.1 acres of proposed impervious cover over the Recharge Zone represents less than 0.1 percent of the total area of the Barton Springs segment of the Recharge Zone. Proposed water quality protection measures and BMPs to be utilized under the Build Alternative would remove at least 90 percent of post-construction TSS generated by the increase in impervious cover over the Recharge Zone, more than 10 percent higher than the 80 percent required under the TCEQ's Edwards Aquifer Rules. Total suspended solids (TSS) loadings after construction would be lower than native existing conditions (approximately 22.6 percent reduction in TSS load for the entire state-owned ROW) due to proposed water quality treatment measures. Potential for pollutants in stormwater runoff from the construction site and completed roadway to enter the aquifer and potential for changes in recharge rates to the aquifer resulting from increases in impervious cover would be minor. Impacts would be minimized by the use of robust BMPs during roadway construction and operation. These BMPs include multiple levels of water quality treatment measures, such as PFC pavement, water quality ponds, vegetative filter strips, and grassy swales. During construction, project activities would be guided by an Environmental Compliance Management Plan (ECMP) which would include protocols designed to avoid environmental impacts. As part of the ECMP, an Environmental Compliance Manager would be on site to monitor construction activities and BMP performance. The Environmental Compliance Manager would have the authority to enact adaptive management actions including work stoppage and BMP maintenance and repair, as situations warrant. Stormwater runoff would also be treated by BMPs over the Transition Zone, although treatment over the Transition Zone is not required by TCEQ.

Flint Ridge Cave is a sensitive recharge feature that has its surface opening location approximately 150 feet outside of the state-owned ROW. The surface opening of this feature would not be directly impacted by the proposed project. However, a portion of the drainage area and sections of the cave passage are overlapped by the state-owned ROW. By modifying the alignment evaluated in the DEIS to avoid permanent filling or other direct impacts to the openings or surface expressions of 17 sensitive karst features to the extent practical and minimizing impacts to the Flint Ridge Cave catchment basin from 5.6 acres to approximately 0.7 acre, approximately 1.3 percent (approximately 0.7 acre out of approximately 55.5 acres) of the surface catchment basin would be covered by impervious surfaces. Under the proposed design, no runoff from disturbed areas or the eventual roadway surface would enter the cave opening. Concrete traffic barriers along the travel lanes and attached stormwater conduits would capture

and direct on-site runoff to water quality ponds that would discharge stormwater into Bear Creek after treatment. To mitigate for the portion of the catchment basin of Flint Ridge Cave that would be removed under the Build Alternative, the original size of the surface drainage basin of Flint Ridge Cave would be maintained by capturing surface runoff from adjacent undeveloped areas and re-routing it into the cave's surface drainage area. This off-site runoff would not be allowed to comingle with roadway runoff.

Impacts to surface waters in the study area would also be minimized using BMPs during both construction and operation of the proposed project. Over five acres of earth would be disturbed as a result of the Build Alternative, requiring preparation of a Stormwater Pollution Prevention Plan (SW3P) for the project. Stormwater runoff would be addressed through compliance with the Texas Pollutant Discharge Elimination System (TPDES) and Edwards Aquifer WPAP. Based on current design concepts, the Build Alternative would span the ordinary high water mark (OHWM) of creeks present in the state-owned ROW. Bridge piers would not be placed in locations that would increase the base flood elevation; therefore, no impacts to floodplains would be expected under the Build Alternative.

Induced growth as a result of the Build Alternative is not anticipated to be significant, so impacts to water quality and groundwater recharge as a result of induced growth are similarly expected to be minor. Surface and groundwater resources in the proposed project's AOI are not anticipated to be substantially adversely affected due to the large amount of preserved WQPLs and the implementation of BMPs. Additionally, several regulations are in place to protect water quality from the effects of induced development, including TCEQ regulations requiring BMPs and preparation of SW3Ps, COA drainage/water quality requirements and ordinances (which would apply to the portion of the AOI within Austin city limits), Travis County's Stormwater Management Plan (which would apply to the portion of the AOI within Travis County), and Section 404 of the CWA. See **Section 3.6** in the FEIS for discussions of existing conditions and potential project-related impacts to groundwater resources and water quality. See the ***Water Quality and Aquatic Resource Protection Technical Report*** **(Appendix H)** for discussions of water quality protection and BMPs associated with the proposed project. See the ***Indirect Impacts Technical Report*** **(Appendix D)** and ***Cumulative Impacts Technical Report*** **(Appendix I)** for discussions of potential indirect and cumulative impacts on groundwater resources and water quality.

Threatened and Endangered Species

The study area for assessing direct impacts to threatened and endangered species is the approximately 5,327-acre area described at the beginning of **Section ES.5**. Golden-cheeked Warbler presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler calls on the final survey in an attempt to elicit a response per USFWS guidelines. No Golden-cheeked Warblers were found during the survey and no habitat known to be used by the

species is present within the state-owned ROW (**Appendix M: Biological Evaluation and Technical Reports**).

The study area lies outside of the known ranges of all federally listed endangered karst invertebrates; therefore, no impacts to any of the listed karst species are expected as a result of the proposed project. Based on the results of field surveys conducted in December 2013 and spring of 2014, no suitable habitat for the federally endangered Black-capped Vireo is present in the ROW and no impacts to this species are expected. Potential habitat for the state-threatened Texas horned lizard may be present within the study area, although this species now occurs scarcely in the region. No highly suitable habitat for this species is present in the state-owned ROW and no impacts to the Texas horned lizard from the proposed project are expected.

No habitat for the federally endangered Austin blind and Barton Springs salamanders is present on the surface within or adjacent to the state-owned ROW, so no direct impacts to either species are expected. These species are supported by water from the Edwards Aquifer. No significant impacts to the quality of groundwater in the Edwards Aquifer are expected as a result of the project because of robust stormwater control BMPs. Therefore, no significant indirect impacts to Austin blind and Barton Springs salamanders are expected as a result of construction of the proposed project.

The effect that construction of SH 45SW would have on traffic patterns could prove beneficial to water quality in the Edwards Aquifer. Currently, a high volume of traffic crosses the Edwards Aquifer Recharge Zone between the city of Austin and northern Hays County via FM 1626 and Brodie Lane. Brodie Lane is not equipped with the robust system of stormwater control BMPs that is proposed for use with SH 45SW. Construction of the proposed project is expected to reduce traffic volumes on Brodie Lane by shifting some of that traffic to SH 45SW. This would allow a greater percentage of the total pollutant load in runoff generated on the Recharge Zone through use of vehicles to receive treatment prior to discharge to pervious surfaces.

Development in the region is occurring in absence of SH 45SW. Development occurring in response to construction of SH 45SW is expected to be minimal as a result of the limited access the roadway would afford. Any such development occurring within the Contributing or Recharge Zones of the Edwards Aquifer would need to adhere to the Edwards Aquifer Rules and TCEQ requirements. Therefore, no significant indirect or cumulative impacts to either salamander species are anticipated as a result of the proposed project. See **Section 3.8** in the FEIS for discussions of existing conditions and potential project-related impacts to threatened and endangered species. See the ***Indirect Impacts Technical Report*** **(Appendix D)** and ***Cumulative Impacts Technical Report*** **(Appendix I)** for discussions of potential indirect and cumulative impacts on threatened and endangered species.

Vegetation

Of the approximately 312 acres of vegetation within the proposed project ROW, approximately 161 acres would be impacted either permanently or temporarily under the Build Alternative through the clearing of trees and brush, need for construction equipment staging areas, and laying of new pavement. Approximately 1.9 acres of riparian and floodplain vegetation would be impacted by the proposed project. TxDOT would mark areas outside the active construction zone and protect them from disturbance. Revegetation of temporarily disturbed areas would comply with TxDOT's *Vegetation Management Guidelines.* See **Section 3.8** in the FEIS for discussions of existing conditions and potential project-related impacts to vegetation.

Hazardous Materials

Nine federal and state hazardous material sites are located within one mile of the state-owned ROW according to SH 45SW Radius Report data. Of these nine sites, one is listed as a TCEQ Spill Incident List (SPILLS) site, five are listed as Texas Tier II Chemical Reporting Program (TIER II) sites, one is listed as an Above-ground Storage Tank (AST) and one site contains four Underground Storage Tanks (UST), one of which is a Leaking Petroleum Storage Tank (LPST). A windshield survey of the database search area was performed on August 12, 2013 to verify the results of the GeoSearch Radius Report and on January 2, 2015 to verify the results of the EDR Radius Report. The current database search area is limited to the proposed project area between MoPac and FM 1626, and encompasses areas within up to one mile of the proposed project area between MoPac and FM 1626.Over 100 gallons of asphalt or road oil/tar was released at the SPILLS site, located near the intersection of existing SH 45 and MoPac in 1997. There was no closure date given for this incident in the database search report. Edwards Aquifer Permits (EAP) at this location (SH 45 at MoPac) indicate that two permits were issued to TxDOT, one in 1998 and another in 1999, with the location found to be in compliance. However, the EAPs are not related to the SPILLS site. This SPILLS site has the greatest potential to impact the proposed project through either contaminated soil or groundwater. In the event that construction crews encounter contaminated soil or groundwater during project implementation, all activities must cease until contaminated materials are properly removed from the area and taken to an appropriate disposal site in compliance with applicable federal, state, and municipal laws.

The storage and use of hazardous materials would be necessary during construction of the proposed project. Use and handling of hazardous materials associated with construction machinery and equipment would pose a minimal risk to the environment if appropriate safety measures and BMPs are applied. On-site storage of hazardous materials within the proposed project area would be short-term and closely monitored. Secondary containment would be required for all hazardous material storage sites. See **Section 3.11** in the FEIS for discussions of existing conditions and potential project-related impacts of hazardous materials.

Indirect and Cumulative Impacts

Indirect Impacts

Indirect impacts (also called indirect effects) are impacts caused by an action and occur later in time or are farther removed in distance than direct impacts, but are still reasonably foreseeable. Indirect impacts may include growth-inducing effects; other effects related to project-induced changes in the pattern of land use, population density, or population growth rate; and related effects on air, water, and other natural systems (40 CFR 1508.8). Indirect impacts are analyzed within the project's Area of Influence (AOI), the boundaries of which are Slaughter Road to the north, RM 1826 to the west, RM 967 to the south, and IH 35 to the east – an area totaling approximately 41,674 acres.

The following resources are analyzed in detail for potentially substantial indirect impacts: 1) threatened and endangered species and 2) water resources – including the Edwards Aquifer/groundwater (including related karst geology) and surface water.

Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis Counties, and the responses of local planning experts to a questionnaire on potential indirect impacts, the proposed project is not anticipated to generate significant induced development. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would constrain the amount of induced growth possible in the AOI. The degree to which that development is specifically attributable to construction of the proposed project is limited for several reasons: there is a high growth rate in the area in general, there is limited development potential nearby due to undevelopable lands, the area is also surrounded by developments that are already underway, and the roadway may serve regional traffic to a greater degree than it serves local traffic or spurs local development.

Approximately 9,387 acres ("developable land") of undeveloped land within the 41,674-acre AOI could be subject to development in the foreseeable future (through 2035). Land that is already planned or platted for development was not included in this total as it is assumed that that land will be developed. The developable land was identified through planner questionnaires and cartographic analysis, and its development is considered possible but not necessarily probable (as opposed to land that is already planned or platted which is considered probable and reasonably foreseeable, regardless of the proposed project). The developable land is not necessarily causally connected to the proposed roadway project. Potential development at intersections with existing roadways is the most likely to occur in conjunction with the proposed project. Induced growth that may occur could have some effect on water resources because induced development would result in increased impervious cover, which could in turn have an effect on water quality. However, surface water and groundwater in the AOI would not be adversely affected in a substantial way from the proposed project because of the high

percentage of managed areas and the implementation of regulations and BMPs. Individual developers would be responsible for complying with these regulations.

The indirect impacts analysis described in the ***Indirect Impacts Technical Report*** (**Appendix D**) indicates that the potential indirect impacts associated with the proposed project do not conflict with the various goals of planning and conservation entities in the AOI; are not expected to substantially worsen the condition of a sensitive resource; would not delay or interfere with habitat conservation planning efforts or species recovery efforts for sensitive species; would not eliminate a valued, unique, or vulnerable feature; and are not inconsistent with applicable laws. Therefore, additional mitigation is not proposed for the anticipated indirect impacts potentially caused by construction of SH 45SW.

Cumulative Impacts

Cumulative impacts (also called cumulative effects) are defined as impacts "on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (NEPA, Section 1508.7, 1978).

The ***Cumulative Impacts Technical Report*** (**Appendix I**) identifies Golden-cheeked Warblers, Austin blind salamanders, and Barton Springs salamanders and their habitats as sensitive resources and analyzes these resources for potential substantial cumulative impacts within each resource's Resource Study Area (RSA).

The proposed project would add a total of approximately 51.6 acres of impervious cover, of which 48.1 acres (93.2 percent) would be added within the Recharge Zone of the Edwards Aquifer. Research has shown a strong correlation between the imperviousness of a watershed and the health of its receiving streams. As an assessment of impervious cover in the watershed makes evident, past activities have resulted in the development and changing land uses in the watersheds within the RSA. As the trend for growth in the Austin area continues, the trend for increased impervious cover in the watersheds in the RSA would be expected to continue. Generally speaking, the correlation between increased impervious cover and decreased surface water quality is strong. However, with current regulatory measures and future planning efforts to protect water quality, future development would be less likely to adversely affect surface and groundwater quality. With implementation of the various BMPs, and requirements set by numerous authorities that govern within the RSA, it is likely that the proposed project (with its robust water quality control commitments) would minimally contribute to cumulative impacts to water quality or quantity.

Based on the analysis in the ***Cumulative Impacts Technical Report*** (**Appendix I***)*, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Golden-cheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable projects. This determination is supported by several factors, including: limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction; the incremental contribution the proposed roadway would make toward induced development in the AOI; and the continuing trends of land use development and conservation initiatives underway within the RSAs.

No Build Alternative

The impacts associated with the No Build Alternative would result from the continuation of existing conditions, rather than the construction of a new location tollway. Population growth would be expected to continue in the study area (CAMPO, 2010b) and travel times on existing roadways would be expected to lengthen (RTG, 2014). Under this alternative, it is assumed that all other projects listed in the CAMPO *2035 RTP* would be implemented.

Impacts to the Human Environment

Land Use

No project-related changes in land use would occur under the No Build Alternative, as the proposed project would not be constructed.

Socioeconomic Resources

No displacements or relocations related to SH 45SW would occur as a result of the No Build Alternative, nor would project-related changes in access or travel patterns be anticipated.

Travel times along existing roadways in the area are projected to be 45 percent higher on average in 2035 without the proposed project than with the proposed project (**Section 3.2.2**; RTG, 2014). Economic impacts associated with the No Build Alternative would stem from the cost of travel along area roadways: as travel times lengthen into 2035, the time cost of travel would increase as well.

Project-related impacts to environmental justice (EJ) populations would not occur under the No Build Alternative.

Air Quality

The VMT estimated for the No Build Alternative is slightly lower (15 percent) than for the Build Alternative; this decrease in VMT means MSAT under the No Build Alternative would probably be lower than the Build Alternative in the study area. However, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Noise

No project-related roadway noise impacts would be associated with the No Build Alternative.

Archeological and Historic Resources

Project-related impacts to archeological resources within the proposed project's APE would not occur under the No Build Alternative. No historic resources have been identified in the proposed project APE; no project-related impacts to historic resources would be expected to occur.

Visual and Aesthetic Resources

No project-related impacts to visual or aesthetic resources would occur under the No Build Alternative.

Impacts to the Natural Environment

Geology and Soils

Under the No Build Alternative, project-related impacts to karst features in the state-owned ROW would not occur.

Waters of the United States and Wetlands

Under the No Build Alternative, project-related impacts to waters of the U.S. or wetlands would not occur.

Water Quality

Neither project-related impacts to groundwater resources, including the Edwards Aquifer, nor to surface water resources in the study area would occur under the No Build Alternative.

Threatened and Endangered Species

No direct impacts to threatened or endangered species are expected under this alternative. In absence of SH 45SW, a greater number of vehicles in the future are expected to utilize Brodie Lane and other roadways on the Recharge Zone that are not equipped with the robust stormwater control BMPs proposed to be used as part of the proposed project. Thus, under the No Build Alternative, more pollutants generated by vehicles outside the state-owned ROW could be introduced to groundwater of the Barton Springs segment of the Edwards Aquifer than would be expected under the Build Alternative.

Vegetation

Under the No Build Alternative, vegetation within the state-owned ROW would not be disturbed.

Hazardous Materials

Due to the lack of construction associated with the No Build Alternative, no project-related impacts to regulated state or federal hazardous material sites in the study area would occur.

ES.6 PUBLIC AND AGENCY INVOLVEMENT

Public involvement has been on-going concurrently with the development of the DEIS and FEIS and will continue throughout the project development process. Efforts to date have included public and agency scoping meetings, a Public Hearing, technical workgroup meetings, stakeholder meetings, and an Environmental Listening Workshop. In addition, a project website, electronic newsletters, informational flyers and social media were employed to facilitate public outreach.

To facilitate public and agency input in the development of the DEIS and FEIS for SH 45SW, the project team developed a Public and Agency Coordination Plan for the proposed project. The plan identified strategies to inform, engage, and respond to stakeholders in a transparent, meaningful, and constructive process. Public engagement included electronic communication and face-to-face interaction with stakeholders.

Two open house public meetings were held as part of the EIS scoping process. The first meeting in October 2013 focused on gathering public comment and input on the scope of the study, the draft Coordination Plan, and the proposed project's purpose and need. The second meeting in December 2013 was held to gather public input on the alternatives being considered to fulfill the purpose and need.

Agency scoping meetings were held in July and December 2013, in which TxDOT, the Mobility Authority, and the project team worked together with participating agencies including U.S. Fish and Wildlife Service, Barton Springs/Edwards Aquifer Conservation District, COA, Travis County, Hays County, and Texas Parks and Wildlife Department to identify and address issues of concern regarding the proposed project's potential environmental impacts.

One technical workgroup and two subcommittees have been convened to identify potential issues associated with the proposed project and to work cooperatively among members to develop possible solutions. Five general technical workgroup meetings were held in October and December 2013 and May, July, and September 2014. Engineering subcommittee meetings were convened in October and November 2013 in which members identified and analyzed the most efficient and effective BMPs that could be applied to the proposed project. Finally, a biology and karst subcommittee meeting was held in January 2014 to focus on potential ecological and water quality issues associated with the proposed project.

A Public Hearing was held by TxDOT and the Mobility Authority on July 29, 2014, to gather input regarding SH 45SW. The purpose of the hearing was to give the community an opportunity to share thoughts on the preferred alternative and its potential environmental impacts, as detailed in the FEIS. 490 members of the general public signed in at the meeting; 41 speakers provided verbal comments on the project recorded by a court reporter. A total of 1,208 public comment submissions were received during the official comment period, which ran from Sunday, June 29, 2014, to Wednesday, August 13, 2014. TxDOT responded to the public and agency comments received during this period (see **Appendix L: Public Meeting Summary Reports** for the Public Hearing Summary Report and comment responses), and this public and agency input resulted in the following changes to the proposed project and analysis:

- Realignment of the roadway to avoid and minimize impacts to sensitive karst features in the ROW;
- Reconfiguration of the MoPac-SH 45SW interchange to increase safety; New location for connection with the proposed Violet Crown Trail resulting from coordination with the City of Austin and Hill Country Conservancy;
- Analysis of lighting impacts; and
- Analysis of the viewshed from the Lady Bird Johnson Wildflower Center's San Antonio Tower.

See **Section 7.0** in the FEIS for discussion of public and agency coordination throughout the project process. See **Appendix K: Agency Coordination** for agency coordination letters and **Appendix L: Public Meeting Summary Reports** for public meeting summary reports.

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1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The Texas Department of Transportation (TxDOT), in conjunction with the Central Texas Regional Mobility Authority (Mobility Authority), proposes to construct a new location facility located in Travis and Hays counties, extending from State Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626. The purpose of the proposed project is to improve system connectivity, local mobility, and travel times, and to provide an efficient alternative route to congested local roadways in northern Hays and southern Travis counties. The proposed project would address the congestion and delays stemming from the lack of efficient, direct routes connecting northern Hays County to Travis County and Austin and the fact that existing routes within the area are circuitous and require drivers to pass through numerous signalized intersections, contributing to long travel times. The purpose of the proposed project is described in greater detail in **Section 1.3** and the need in **Section 1.4**.

The study area for the SH 45SW project (hereafter referred to as "proposed project") encompasses a rectangular shaped area of approximately 5,327 acres, extending from 0.8 mile west and 0.6 mile north of the SH 45/MoPac interchange southeast to FM 1626. The study area is approximately two miles wide by 4.3 miles long, as shown in **Figure 1.1-1**. The study area, which was presented during the EIS scoping process, is of sufficient size to allow for a comprehensive evaluation of potential project-related effects on a broad range of resources while being constrained enough to ensure focused and relevant project-related analysis.

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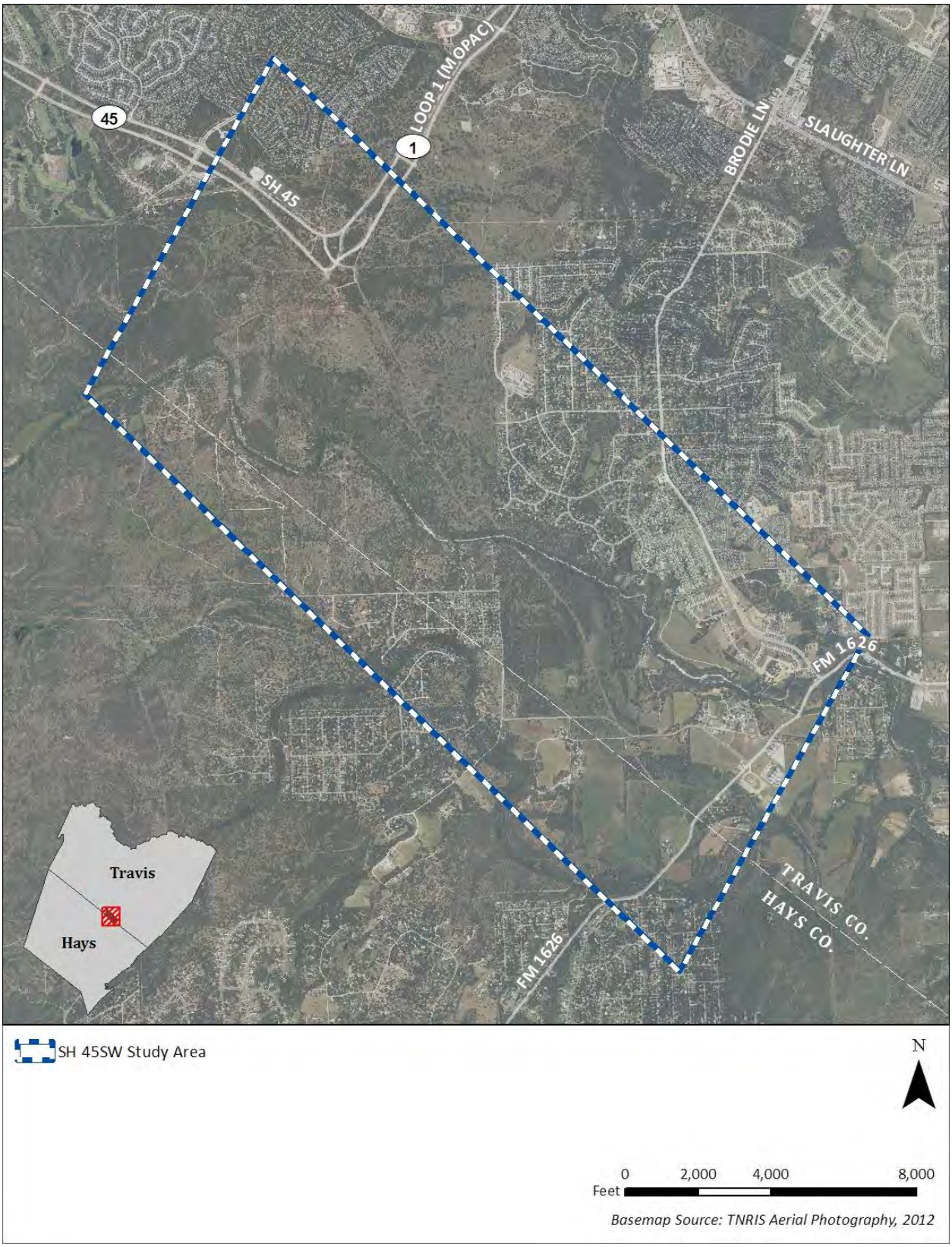
Figure 1.1-1: Proposed SH 45SW Study Area



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1.1.1 Logical Termini and Independent Utility

The termini of the proposed project are MoPac and FM 1626. MoPac is a regional transportation facility that connects southern Travis County to downtown and north Austin, other regional roadways (US 183 and SH 45N), and communities farther north (such as Round Rock). FM 1626 is a regional farm-to-market road that connects communities in northern Hays County (including Kyle and Buda) and in southern Travis County to IH 35 and Manchaca Road. Many commuters on FM 1626 currently use local roadways, including Brodie Lane and Slaughter Lane, to access MoPac (HNTB, 2014; see memorandum in **Appendix N: Traffic Memorandum**). Constructing the proposed project between MoPac and FM 1626 would result in a usable transportation improvement and a reasonable expenditure of public funds even if no additional improvements are made in the area. The project would stand alone, be independently functional, and serve a substantial public purpose by itself. In addition, it would not predetermine locations and types of future transportation improvements or force future sections of projects or alignments. Therefore, the project has both logical termini and independent utility.

The following sections provide the Project History (**Section 1.2**) and the Purpose and Need (**Sections 1.3 - 1.4**) for the proposed project.

1.2 Project History

The development of SH 45 can be dated back to the early 1980s and has evolved into the current non-federally funded project discussed in this Final Environmental Impact Statement (FEIS). The currently proposed project was initially encompassed in the larger SH 45 project, originally known as the Austin Outer Parkway, a controlled-access highway circling the city of Austin. Most of the Austin Outer Parkway was proposed as an ultimate freeway composed of limited access roadway with full grade separated interchanges. The entire project was planned to be approximately 84 miles in length, divided into five independent segments. Segment 3 of the Austin Outer Parkway was proposed from US 290 west of Austin to IH 35 south of Austin. Segment 3 included the area that is studied in this FEIS. The Environmental Impact Statement (EIS) for Segment 3 was approved in 1989. Based on that approval, Travis and Hays counties subsequently acquired right-of-way (ROW) for the roadway between MoPac and FM 1626. The counties deeded this land to the State in 2003 and 2005, respectively. In March 2014, Hays and Travis County commissioners approved a funding agreement for the proposed project in which the two counties would partner with the Mobility Authority to fund construction of the proposed project. Hays County would commit five million dollars and Travis County would commit 15 million dollars to construction of the proposed project, if a build alternative is selected (Thorne, 2014). A Project Development Agreement has not been finalized between TxDOT and the Mobility Authority.

Differences between the Austin Outer Parkway Final Environmental Impact Statement (FEIS) and the Current Project

The Austin Outer Parkway Segment 3 limits were from US 290 west of Austin to IH 35 south of Austin. The typical section for Segment 3 from IH 35 to MoPac was proposed as three lanes in each direction with frontage roads from Bliss Spillar Road to IH 35. The typical section for Segment 3 from MoPac to US 290 was proposed as two mainlanes and two two-lane frontage roads in each direction. Only one portion of Segment 3, the frontage roads between Ranch-to-Market Road (RM) 1826 and MoPac, was constructed. The mainlanes within this segment have not been constructed.

By 1994, when CAMPO adopted *the Austin Metropolitan Area 2020 Transportation Plan* (*2020 Plan*), SH 45 was no longer envisioned as the Austin Outer Parkway. SH 45SW from MoPac to FM 1626 was included in the *2020 Plan* as a two-lane Minor Arterial, with right-of-way (ROW) preserved for a four-lane parkway. In July 2004, as an amendment to the *2025 Plan*, the plan for SH 45SW was revised to include a four-lane, tolled parkway, with two free lanes (CAMPO, 2004). By May 2010, with the adoption of the *2035 RTP*, SH 45SW was planned as a four-lane tolled parkway/freeway from MoPac to FM 1626, which is the proposed project being studied as part of this FEIS.

1.3 Purpose of the Proposed Action

The purpose of the proposed action is to improve system connectivity, local mobility, and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties. To address the transportation challenges in this area, the CAMPO Board voted to include SH 45SW in the *2035 RTP* as a four-lane tolled freeway between MoPac and FM 1626 (CAMPO, 2010a). SH 45SW is planned as a state and locally funded (non-federal) project, as described in **Section 1.1**.

1.4 Need for the Proposed Action

Population growth in northern Hays and southern Travis counties is contributing to increasing congestion and longer travel times on local roadways. The population of the census tracts surrounding the study area grew from 10,378 persons in 1990 to 35,415 persons in 2010, an increase of 241 percent. By comparison, Travis County's population grew from 576,407 people to 1,038,595 people over the same time period, an 80 percent increase. Hays County's population grew from 65,614 people to 152,180 people, a 132 percent increase (U.S. Census, 1990, 2010).

While the Census provides a record of the historical population growth, CAMPO Traffic Analysis Zones (TAZs)[1] that most closely match the census tract boundaries were used to develop population growth projections for the years 2010 through 2035 (**Figure 1.4-1**). Population within these TAZs is projected to increase by approximately 40 percent between 2010 and 2035 to approximately 46,873 residents (CAMPO, 2010b).

[1] Traffic Analysis Zones (TAZs) are the basic geographic unit of analysis in a travel demand forecasting model and contain demographic and land use data (Travel Model Improvement Program. 2007. *Technical Synthesis – Defining Traffic Analysis Zones* < http://tmiponline.org/Clearinghouse/Items/Technical_Synthesis_-_Defining_Traffic_Analysis_Zones.aspx> (Accessed May 19, 2014)).

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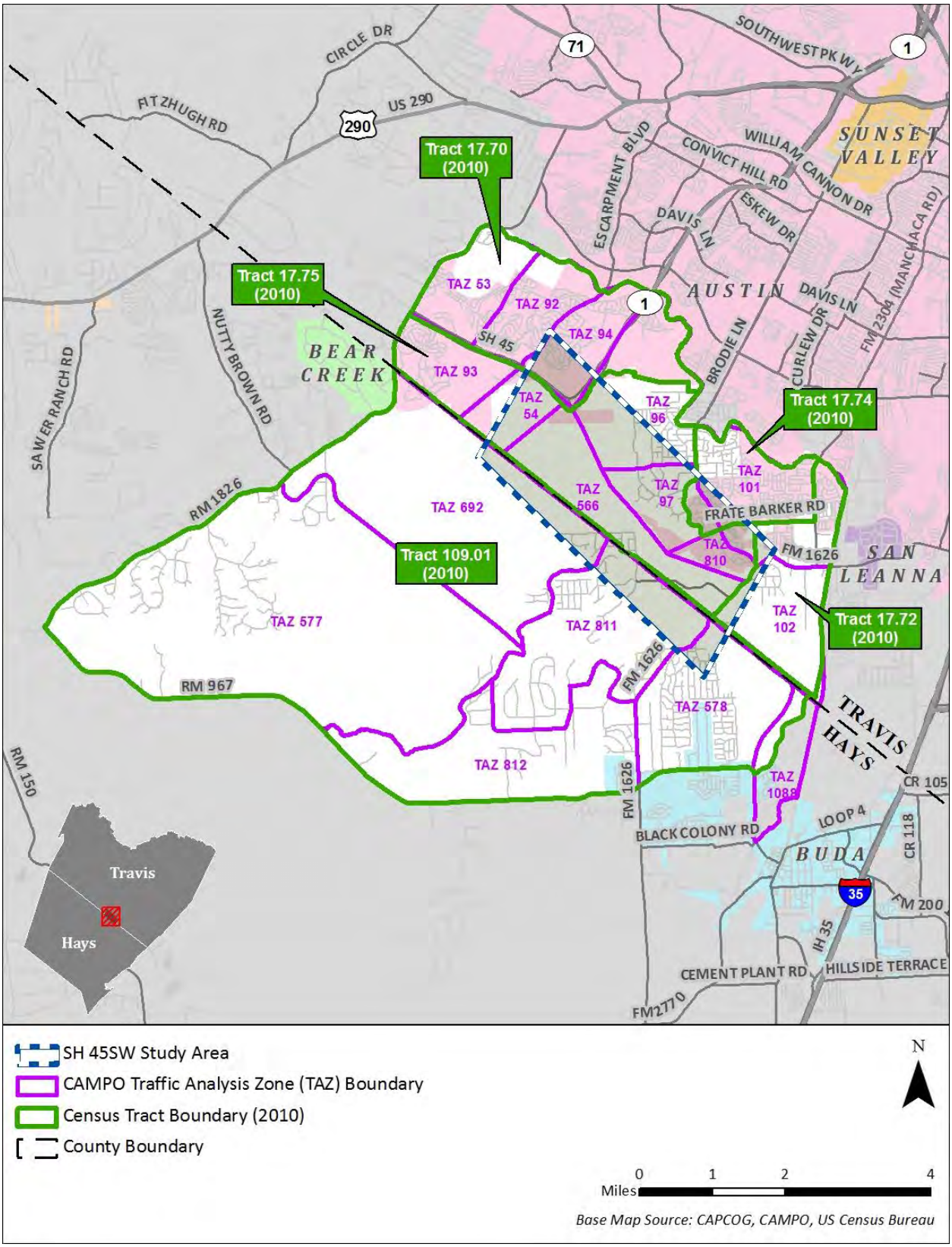
Figure 1.4-1: Census Tracts and CAMPO TAZ Boundaries Surrounding the Study Area



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As the population increases, so does the volume of traffic on the roadway network. Drivers currently experience congestion-related delays on roads in southern Travis and northern Hays counties. With the population in the area projected to increase, as discussed in the paragraph above, these congestion-related delays can be expected to worsen. Calculations of travel time differences using the CAMPO 2035 travel demand model, adjusted to reflect updated demographic and traffic conditions, indicate that travel times along existing routes in northern Hays and southern Travis counties in 2035 are projected to be 89 to 97 percent longer in the morning and 42 to 90 percent longer in the afternoon, depending on the route taken, than observed travel times in 2014 (**Table 1.4-1**).

Table 1.4-1: Travel Time Differences along Existing Local Roadways 2014-2035

Peak Hour	Route	2014 Observed Travel Time (min) (1)	2035 Projected Travel Time (min)(2)	Percentage Increase in Travel Time 2014-2035
AM	FM 1626-Brodie-Slaughter-MoPac	20	39	89%
AM	FM 1626-Manchaca-Slaughter-MoPac	22	44(3)	97%
PM	MoPac-Slaughter-Brodie-FM 1626	19	37	90%
PM	MoPac-Slaughter-Manchaca-FM 1626	29	41	42%

Source: RTG, 2014
(1): A minute of travel time was added to account for the decrease in speed associated with MoPac on and off ramps.
(2): Travel time projections are for 2035 for the No Build scenario (without the proposed project).
(3): Travel times adjacent to Menchaca Elementary were increased 25% to account for the reduced speed in the school zone.

There is a lack of efficient, direct routes connecting Hays County to Travis County and Austin. Commuters living in southern Travis and northern Hays counties, west of IH 35 and east of RM 1826, currently have a limited number of routes available if they wish to travel north to employment and activity centers located in central Austin (**Figure 1.4-2**). These routes involve using local roadways such as Brodie Lane, which is a two-lane major arterial, and FM 2304 (Manchaca Road) and South 1st Street, which are three to four-lane major arterials to access highways such as MoPac and IH 35 via Slaughter Lane. However, these routes are circuitous and contain numerous intersections. In order to reach IH 35 via FM 1626, starting at Bliss Spillar Road commuters pass through five signalized intersections (**Figure 1.4-2**). In order to reach MoPac via Brodie Lane, commuters pass through 11 signalized intersections; to reach MoPac via Manchaca Road, commuters pass through 15 signalized intersections. The existing circuitous routes, combined with numerous signalized intersections, contribute to long travel times. As a result, there is a need for an alternative route that would improve mobility, travel times, and connectivity in the area.

Finally, the CAMPO *2035 RTP* identifies the construction of SH 45SW between FM 1626 and MoPac as part of the region's transportation improvements. The proposed SH 45SW would contribute to improving the overall function of the transportation system in this area. The relevant pages from the *2035 RTP* are provided in **Appendix A: Planning Documents**.

Alternatives are being evaluated that would improve the connection between FM 1626 and MoPac, thereby improving mobility and reducing travel times for the commuters in southern Travis and northern Hays counties (**Table 1.4-2**).

Table 1.4-2: SH 45SW Summary of Purpose and Need

Desired Outcome (Purpose)	Condition to be Addressed (Need)
• Improve system connectivity and local mobility • Improve travel times • Provide an alternative route to congested local roadways	• Lack of efficient, direct routes connecting northern Hays County to Travis County and Austin • Existing circuitous routes, combined with numerous signalized intersections, contribute to long travel times • Traffic congestion causes delays on the local roadway network

Figure 1.4-2: Signalized Intersections on Roadways Providing Access between Northern Hays County and Austin

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1.5 Other Project-Related Goals

The proposed project is located over the Edwards Aquifer Recharge Zone and near sensitive environmental features, such as the City of Austin's (COA) Water Quality Protection Lands (WQPLs). WQPLs are protected from development in perpetuity to preserve the quality and productivity of the Edwards Aquifer.[2] Other sensitive environmental features include Flint Ridge Cave, a recharge feature to the aquifer. Therefore, if a Build Alternative is selected, one of TxDOT's goals would be to construct the proposed project in an environmentally sensitive manner that minimizes, to the maximum extent practicable, the potential for impacts to the Edwards Aquifer from construction and operation of the roadway.

[2] The City of Austin's Water Quality Protection Land program began in 1998 with a bond proposal to purchase and manage land for water quality protection. To date, the program oversees over 26,000 acres of land in the Contributing and Recharge Zones of the Barton Springs segment of the Edwards Aquifer (COA, "Water Quality Protection Land." http://www.austintexas.gov/department/water-quality-protection-land, Accessed 12/15/14).

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2.0 ALTERNATIVES

The process of developing alternatives to meet the project need consisted of three steps: identification of preliminary alternatives, analysis of preliminary alternatives, and identification of reasonable alternatives. Reasonable alternatives were then carried forward for further evaluation in subsequent sections of this FEIS.

2.1 Preliminary Alternatives

Preliminary alternatives were identified and screened based on their ability to meet the purpose and need. Preliminary alternatives considered include Transportation System Management, Travel Demand Management, the Upgrade One or More Existing Roadways Alternative, the New Tollway on New Location Alternative, the New Tollway on Existing State-Owned ROW Alternative, and the No Build Alternative.

2.1.1 Transportation System Management (TSM)

Transportation System Management (TSM) refers to a set of transportation policies or strategies aimed at reducing traffic congestion and improving roadway mobility without major capital expenditures to increase physical roadway traffic capacity. TSM strategies are aimed at making adjustments to the existing transportation system to increase traffic flow and improve mobility. TSM strategies include the optimization of traffic signal timing, improvements in intersection geometry, the designation of High Occupancy Vehicle (HOV) lanes, and deployment of Intelligent Transportation Systems (ITS) technologies.

2.1.2 Travel Demand Management (TDM)

Travel Demand Management (TDM) strategies are designed to reduce the number of vehicles on roadways, particularly during peak travel periods. TDM utilizes programs and policies aimed at decreasing demand by increasing the number of occupants per vehicle; encouraging motorists to avoid driving during morning, noon and evening “rush hours;” and using alternative modes of transportation. Examples of TDM strategies include telecommuting/working from home; priority parking for van pools or car pools; creation of HOV lanes for use by buses, car pools and van pools; “flextime” in the workplace to encourage travel outside the most congested times; improved transit service; and pedestrian and bicycle facilities. This approach involves the integration of transportation planning and broader urban design and land use initiatives, such as higher densities, mixed land use, and increased use of telecommunications.

2.1.3 Upgrade of One or More Existing Roadways

Under this alternative, an existing roadway (sometimes portions of more than one roadway) would be upgraded to a four-lane highway. In this context, a highway is defined as a

high-speed facility with limited access and a divider between traffic moving in opposite directions. Frontage roads would be necessary to maintain local access. Roadways considered for upgrading that would potentially meet the purpose and need under this alternative were Brodie Lane, Manchaca Road, and Slaughter Lane. To sufficiently expand these roads and provide the local access frontage roads, additional ROW would be required.

2.1.4 New Tollway on New Location

Under this alternative, a four-lane highway would be developed on new alignment in a new location other than on the existing state-owned ROW. This would require acquisition of sufficient ROW for main lanes and interchanges.

2.1.5 New Tollway on Existing State-Owned Right-of-Way

Under this alternative, a four-lane highway would be designed within existing state-owned ROW between MoPac and FM 1626. Acquisition of additional ROW would not be required.

2.1.6 No Build

Under this alternative, SH 45SW would not be built. However, the No Build scenario assumes that all other transportation improvements identified in the CAMPO *2035 RTP* would be constructed. This option indicates the consequences if no action is taken on the proposed project.

2.2 Analysis of Preliminary Alternatives

2.2.1 Transportation System Management

TSM was determined to not be a reasonable alternative because it fails to satisfy the proposed project's purpose and need. The strategies described in **Section 2.1.1** – such as optimization of signal timing, intersection improvements, and turn bays – have been implemented by COA on portions of Brodie Lane, Manchaca Road, and Slaughter Lane, and these roadways remain congested. Further, because of the surrounding commercial and residential development, numerous cross streets, traffic lights, and driveways, the ability to implement additional TSM measures is limited. Although TSM would provide improved local mobility and travel times, it would not improve system connectivity or provide an alternative route to congested local roadways. Therefore, TSM alone does not meet the purpose and need and was not advanced for further consideration. While it does not meet the purpose and need on its own, additional TSM strategies could be implemented in conjunction with any of the other alternatives listed below.

2.2.2 Travel Demand Management

TDM was eliminated from further consideration because it does not satisfy the project's purpose and need. Although TDM strategies could provide improved local mobility, travel times, and system connectivity, they would not provide an alternative route to congested local roadways.

The Capital Metropolitan Transportation Authority (Capital Metro) service area is comprised of the following participating jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Volente, and portions of Travis County and Williamson County, and includes portions of the SH 45SW study area. The potential for TDM strategies involving transit to address the purpose and need of the proposed project is limited. The CAMPO *2035 RTP* includes an unsponsored project to "provide a priority lane for buses or implement other strategy to increase person throughput in the Slaughter corridor" from US 290/Convict Hill to US 183 (p. 48). The CAMPO *2035 RTP* also includes a transit station on Slaughter Lane at its intersection with the proposed Lone Star Rail line (CAMPO, 2010). These plans do not include any additional service on Brodie Lane or Manchaca Road, both of which could experience increased traffic as motorists use these north-south roadways to access the planned transit stations on Slaughter Lane.

Bicycle and pedestrian improvements in the study area would not meet the project's purpose and need: these improvements would not improve system connectivity and local mobility or improve travel times.

The Commute Solutions program is a collaborative partnership sponsored by CAMPO that provides resources for commuters interested in carpooling, vanpooling, bicycling and walking, park & ride lots, and transit. Information on flexible work schedules, telecommuting, and parking management and incentives is also provided for employers. Commuters can sign up on the program's website for carpool matching services or find bike buddies for commuting by bicycle (www.commutesolutions.com). Commute Solutions provides alternatives to single occupancy car users in the study area; however these strategies alone do not meet the project's purpose and need as they would not improve system connectivity and local mobility, or provide an alternative route to congested local roadways.

While it does not meet the purpose and need on its own, and therefore was not advanced for further consideration within this document, TDM strategies could be implemented in conjunction with any of the other alternatives since the Build alternative allows buses and registered van pools to travel for free, transit ridership in the corridor would increase if Capitol Metro chooses to expand service to SH 45 SW.

2.2.3 Upgrade of One or More Existing Roadways

The upgrade of existing roadways alternative would satisfy the purpose and need of the proposed project. However, this alternative was dropped from further consideration because the upgrading of Brodie Lane, Manchaca Road, or Slaughter Lane to a highway facility that would meet the purpose and need would require numerous commercial and residential displacements or impacts to protected lands (**Figure 2.2-1**).

In order to meet the purpose and need, 300 feet of ROW would be required to accommodate a four-lane highway with frontage roads. Because the land adjacent to these roadways is already developed, this alternative would require an urban cross-section with narrower clear areas than the rural cross-section used by the other build alternatives. The frontage roads would be needed to maintain local access to cross streets and existing businesses, residences, and other facilities located along these roadways as the facility required to meet the purpose and need would not allow for unlimited access. **Table 2.2-1** provides a summary of potential residential relocations and commercial displacements that could be required to accommodate a four-lane highway with frontage roads on any of these corridors, assuming a centerline alternative (in which the ROW is widened 150 feet on either side of the existing centerline).

Table 2.2-1: Potential Relocations and Displacements Required to Expand Local Roadways to Four-Lane Highways with Frontage Roads

Potential Upgraded Roadways	Current ROW	Proposed ROW Width	Residential Relocations	Commercial and Other Displacements	Total Relocations / Displacements
Brodie and Slaughter Lanes from FM 1626 to MoPac	80’ to 125’	300’	161	6	167
Manchaca Road (FM 2304) and Slaughter Lane from FM 1626 to MoPac	105’ to 270’	300’	170	55	225

Calculations assume ROW is acquired evenly on both sides of the centerline
Source: CP&Y, 2014.

In order to expand Brodie and Slaughter Lanes to sufficiently accommodate the required facility, approximately 112 total acres of new ROW would be required. Approximately 79 acres of this new ROW would be required to upgrade Brodie Lane, 54 acres of which are currently residential development. The remaining 33 acres would be necessary to upgrade Slaughter Lane, 12 acres of which are currently residential. In addition to the number of residences and businesses counted in **Table 2.2-1**, the Brodie and Slaughter Lane Alternative would impact the Brodie Wild WQPL at the southwest corner of Slaughter and Brodie Lanes. This alternative would also require the relocation of the Primrose School as well as structures associated with St. Johns Presbyterian Church.

In order to expand Manchaca Road and Slaughter Lane, approximately 118 total acres of new ROW would be required. Approximately 46 acres of this new ROW would be necessary to upgrade Manchaca Road, 16 acres of which are currently residential development. The remaining 72 acres would be required to improve Slaughter Lane, approximately 30 acres of which are currently residential. The Manchaca Road and Slaughter Lane Alternative would displace two schools (Menchaca Elementary and Austin Christian Academy), impact the track and playscape at Kocureck Elementary, and acquire ROW from the Brodie Wild WQPL.

COA staff, at the request of City Council, reviewed alternative transportation investments to SH 45SW, including interchange improvements to Brodie Lane and upgrades to existing local roadways. Staff findings submitted to Council in September 2014 conclude that roundabout improvements to intersections along Brodie Lane between Slaughter Lane and FM 1626 would not be a viable alternative to SH 45SW due to ROW acquisition, cost, and environmental constraints, and the fact that the roundabouts would not alleviate peak hour demand. City staff also found that more heavily trafficked intersections and drivers on side streets might experience increased delays under the roundabout alternative. For the upgrade of existing roadways alternative which City staff investigated, staff evaluated two options: 1) widening Brodie Lane and FM 1626 from IH 35 to Brodie Lane to four-lane major divided arterials and constructing a grade separated intersection at Brodie Lane and Slaughter Lane, and 2) widening Manchaca Road to a six-lane major divided arterial and FM 1626 from IH 35 to Brodie Lane to a four-lane major divided arterial, as well as constructing a grade separated intersection at Manchaca Road and Slaughter Lane. These options were determined to result in numerous residential and/or commercial displacements (COA, September 2014).

Although residential and commercial relocations could potentially be reduced by shifting the roadway to avoid existing homes and businesses, the potential reductions would be minimal due to the proximity of homes and businesses to these existing roadways and the highly developed character of the land along the roadways. Even a modified alignment would result in relocations and displacements similar to those listed in **Table 2.2-1**. Because there are reasonable alternatives that would satisfy the purpose and need without any relocations or displacements, this alternative is not considered reasonable and was eliminated from further consideration.

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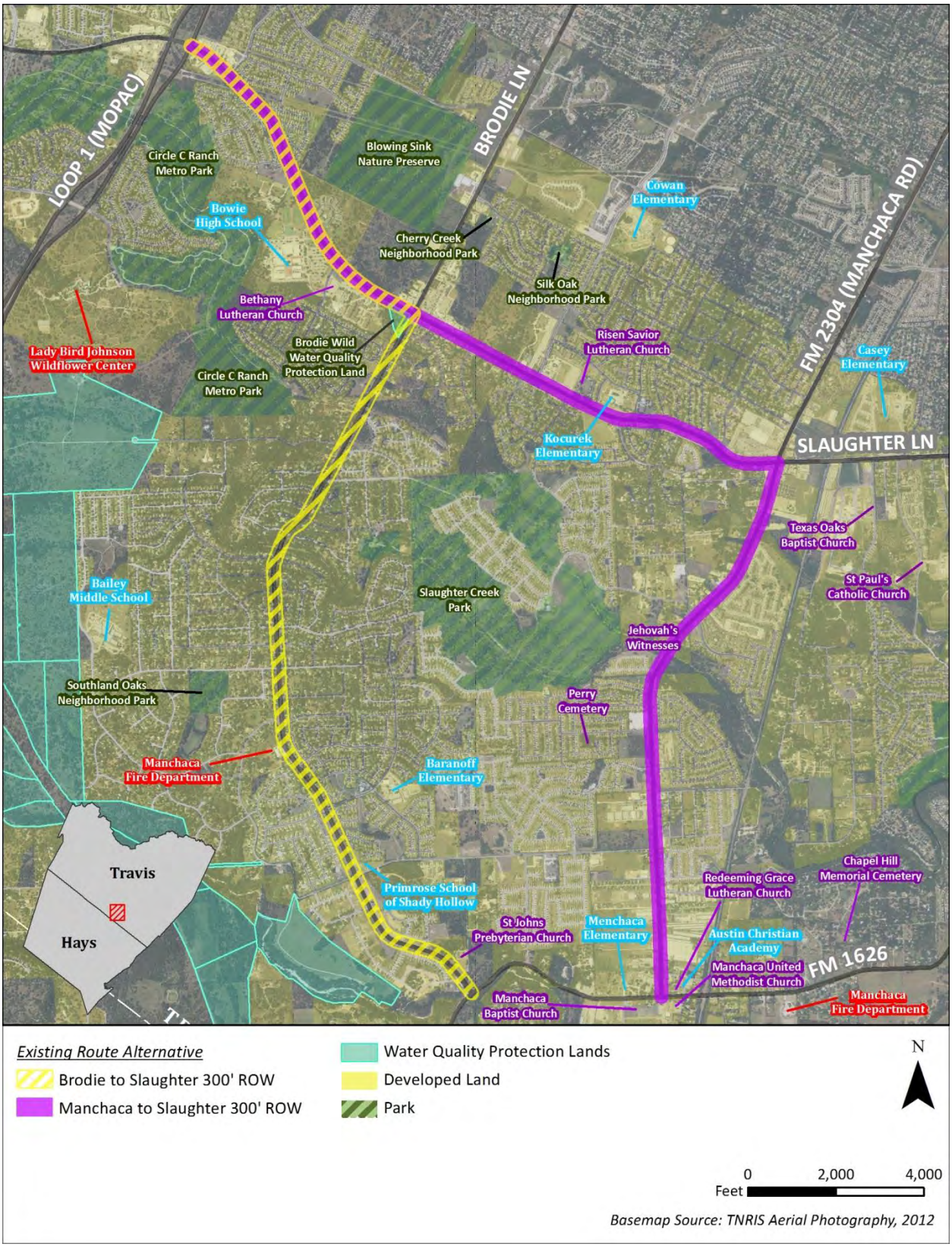
Figure 2.2-1: Upgrade of One or More Existing Roadways Alternative



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2.2.4 New Tollway on New Location

A new roadway on new location outside the existing state-owned ROW would meet the purpose and need of the proposed project. However, this alternative was dropped from consideration because any new location identified in the study area would require the acquisition of WQPLs (**Figure 2.2-2**) and would result in residential displacements. These WQPLs account for over 1,000 acres (34 percent) of the study area and cannot be avoided by any new location alternative outside the existing state-owned ROW. Since this alternative would utilize a rural cross-section, it would require wider clear areas than the urban cross-section that would be used in the Upgrade One or More Existing Roadway Alternative. An urban cross-section would require the use of extensive storm sewer, which would require excavation. In order to protect karst features, excavation needs to be minimized. This wider rural cross-section would be approximately 300 feet wide and would require approximately 150 to 200 acres of new ROW (depending upon the alignment). Even if this alternative were routed to minimize its impacts to COA's WQPLs to the maximum extent possible, residential relocations would still be unavoidable (**Figure 2.2-2**).

2.2.5 New Tollway on Existing State-Owned Right-of-Way

A new roadway constructed on existing state-owned ROW would meet the purpose and need of the proposed project by providing critical system connectivity in the local network. It would also provide an alternative route to congested local roadways, which would improve local mobility and travel times. This alternative would not require the acquisition of new ROW, would not directly affect WQPLs, and would not require any residential relocations or commercial displacements.

Further, this alternative is consistent with regional planning that has occurred over nearly three decades. These efforts are evidenced by the acquisition of ROW for SH 45SW (acquired by Travis and Hays counties under approvals granted through the 1989 EIS) and continued inclusion of the proposed project in the CAMPO long range transportation plans. For these reasons, this alternative will be carried forward for detailed analysis.

2.2.6 No Build

The No Build Alternative, while not meeting the purpose and need, is considered to assess the consequences of no action. Therefore, it was carried forward in the Draft Environmental Impact Statement (DEIS) and in this FEIS.

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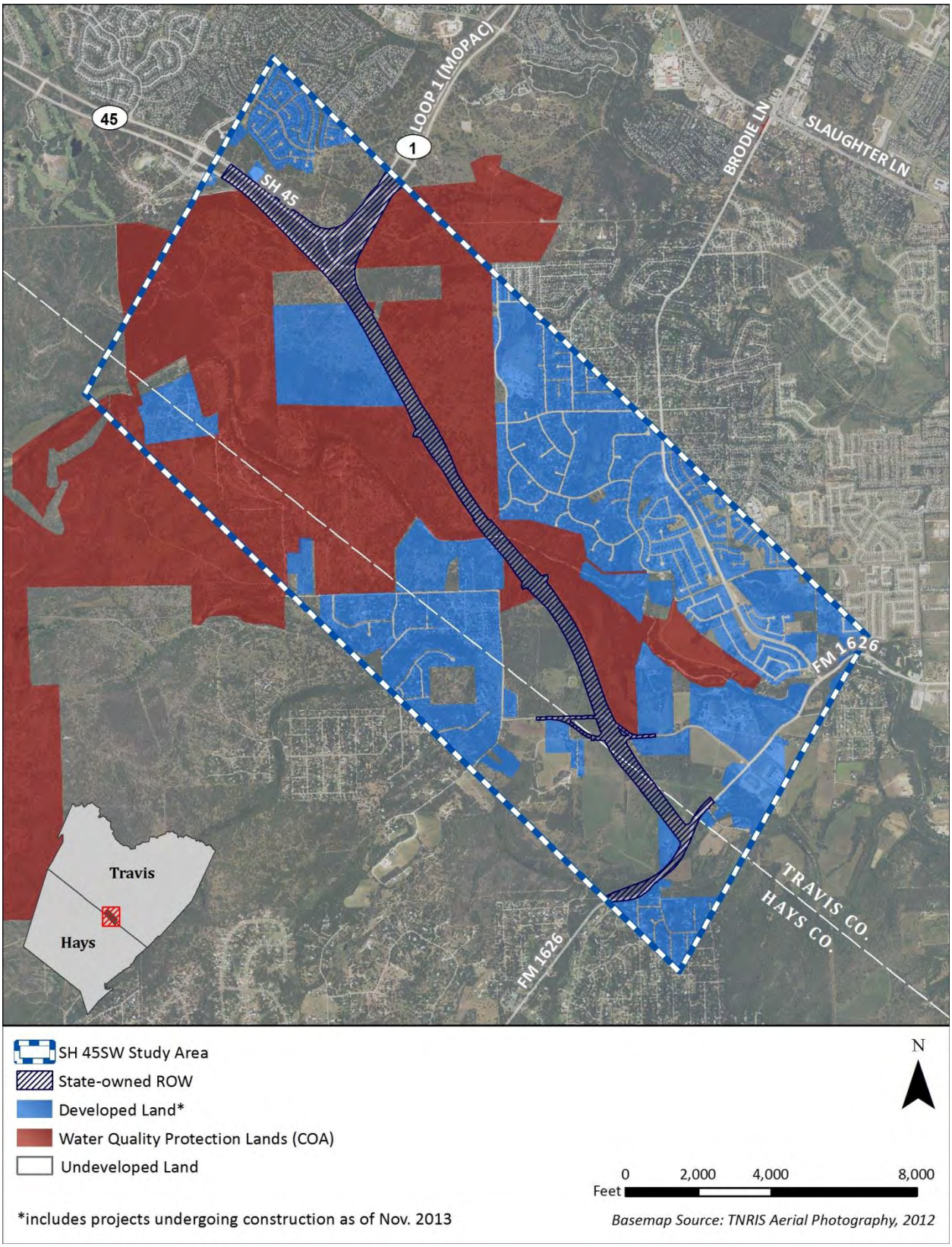
Figure 2.2-2: Water Quality Protection Lands and Development in the Study Area



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2.3 Alternatives to be Carried Forward

Build Alternative

Several of the preliminary alternatives analyzed above would meet the purpose and need of the proposed project: the Upgrade One or More Existing Roadways Alternative, the New Tollway on New Location Alternative, and the New Tollway on Existing State-Owned ROW Alternative. Although the Upgrade One or More Existing Roadways Alternative would meet the purpose and need, it is not reasonable because it would displace a substantial number of residences and businesses and affect WQPLs. The New Tollway on New Location Alternative would also meet the purpose and need of the proposed project; however, this alternative is not considered reasonable because it would require a substantial amount of ROW from existing WQPLs – lands that are protected in perpetuity – and would displace residences and businesses. The New Tollway on Existing State-Owned ROW Alternative is both reasonable – as it does not require residential or commercial displacements or directly affect WQPLs – and meets the purpose and need of the proposed project; therefore, this alternative was carried forward for further evaluation in the DEIS as the Build Alternative and is further supported in the FEIS as the Preferred Alternative. Proposed typical sections for the Build Alternative are provided in **Appendix B: Typical Sections**. The proposed schematic is provided in **Appendix C: Build Alternative Draft Schematic**.

The Build Alternative's total project cost is anticipated to be approximately $100 million. The Build Alternative is proposed as a toll road, in keeping with the description of the SH 45SW project included in the *2035 Regional Transportation Plan* (2010). This regional transportation plan was developed by the Capital Area Metropolitan Planning Organization (CAMPO), which is responsible for transportation planning in the six-county Austin metropolitan region. The proposed facility would utilize an electronic toll tag system to assess tolls. A project-level toll analysis and discussion of impacts related to tolling is included in **Section 3.2.2**.

The Build Alternative is proposed as a four-lane, divided toll road approximately four miles long with 12-foot-wide lanes. As depicted in the Typical Sections shown in **Appendix B: Typical Sections**, from MoPac to Bear Creek, the roadway would have 10-foot-wide outside shoulders and nine-foot-wide inside shoulders. From Bear Creek to FM 1626, the roadway would have 10-foot-wide outside shoulders and four-foot-wide inside shoulders.

A 10-foot-wide shared use path would parallel the roadway, primarily on the south side of SH 45SW. The shared use path would be on each side of SH 45SW south of Bliss Spillar Road. A shared use path bridge would be constructed over Bear Creek and would span the ordinary high water mark (OHWM). The shared use path would cross under the SH 45SW bridges just south of MoPac to accommodate the Violet Crown Trail crossing being planned by COA and the Hill Country Conservancy (HCC). A trailhead with vehicular parking and access to the MoPac frontage road would also be constructed. Shared use path bridges would be

constructed where needed west of MoPac to avoid impacts to Danz Creek and Danz Creek Split. See the schematic in **Appendix C: Build Alternative Draft Schematic** for the location of the shared use path and bridges.

The proposed roadway would be paved with Permeable Friction Course (PFC) pavement; bridges would be concrete. The proposed roadway alignment and profile have been designed to avoid known sensitive karst areas, where practical. Water quality best management practices (BMPs) would be employed to minimize the potential for water quality impacts. These would include the use of vegetative filter strips (VFS) (relatively smooth vegetated areas that accept highway runoff as sheet flow) on 6:1 (9.5-degree angle) or flatter slopes and the use of water quality swales parallel to the roadway. Runoff from bridges would be treated by water quality ponds.

Bridges for SH 45SW would include the following:

1. Mainlane overpass of Bliss Spillar Road and water quality pond.
2. Mainlane overpass of Bear Creek OWHM and water quality pond.
3. Mainlane overpass of the Danz Creek OHWM, water quality ponds, and MoPac.
4. Connector overpass for westbound SH 45SW to northbound MoPac over Danz Creek OHWM. Widening of the existing SH 45 and MoPac bridges over the Danz Creek Split OHWM.

The proposed roadway would provide connections to four existing roadways. Each connection is described below. See the schematic sheets in **Appendix C: Build Alternative Draft Schematic** for illustrations of each of these connections.

Existing SH 45 – The project would connect to existing SH 45 west of MoPac with one-lane connection ramps in each direction. Existing SH 45 is two lanes in each direction with a very wide median. The new SH 45SW ramps would connect to the inside of each existing roadway requiring widening for approximately 2,600 feet westbound and 1,000 feet eastbound from their respective connections.

MoPac – MoPac and existing SH 45 meet to form a T-intersection west of MoPac, providing access only west of MoPac. The intersection would be modified to provide direct connection to the proposed project as well.

The westbound two lanes of SH 45SW would split to provide a direct connection to northbound MoPac and the ramp to westbound existing SH 45. The existing two northbound lanes of MoPac would be widened to three lanes for approximately 900 feet then transition to the existing two lanes to the north over a distance of approximately 1,200 feet.

The existing southbound MoPac lanes would transition from two to three lanes with the middle lane providing the option to proceed either west or east on SH 45. Two lanes would continue west and connect to existing SH 45 as is currently in use. The two new lanes would

form a new "trumpet" interchange (see Sheet 7 of 13 in **Appendix C: Build Alternative Draft Schematic**) leading to eastbound SH 45SW. The two southbound to eastbound lanes would merge with the eastbound ramp from existing SH 45 and continue east as three lanes for approximately 2,000 feet then taper to the two eastbound lanes. The eastbound mainlanes of SH 45SW and westbound ramp would form a four-lane bridge over the MoPac connector roadways.

Bliss Spillar Road – The proposed project would realign Bliss Spillar Road along existing TxDOT ROW to provide better geometry for the intersection (i.e. making the intersection more perpendicular to improve sight lines and turning movements). The mainlanes of SH 45SW would overpass Bliss Spillar Road and connecting ramps would be provided west of Bliss Spillar Road. A one-lane westbound entrance ramp would intersect Bliss Spillar Road and connect to SH 45SW. A one-lane eastbound exit ramp would provide access to Bliss Spillar Road, along with a Texas U-Turn, dedicated right turn lane, and a turning lane beginning just west of the ramp intersection with Bliss Spillar Road (see Sheet 13 of 13 in **Appendix C: Build Alternative Draft Schematic**).

FM 1626 – The eastern terminus of SH 45SW would be an at-grade intersection with FM 1626. FM 1626 is currently under construction and is being upgraded from a two-lane rural FM roadway to a four-lane roadway with a continuous center turn lane and 10-foot-wide shoulders.

Eastbound SH 45SW would increase from two to three lanes just west of the intersection with FM 1626. The right two lanes would turn right onto southbound FM 1626 as independent lanes for approximately 840 feet, then merge into the newly constructed two southbound lanes over a transition of approximately 2,630 feet. The eastbound left lane of SH 45SW would intersect a divided FM 1626 roadway at two locations. The first location would be at a single-point urban intersection (SPUI) formed by three roadways: southbound FM 1626, a two-lane northbound FM 1626 to westbound SH 45SW connector road, and the eastbound SH 45SW connection to northbound FM 1626. A SPUI is a more efficient and innovative method of handling traffic on intersecting roadways, utilizing a single traffic signal instead of four traffic signals at a traditional box-type intersection for divided highways. Beyond the SPUI intersection, this eastbound SH 45SW lane would connect to northbound FM 1626 and merge over a distance of approximately 1,290 feet. The two through northbound lanes of FM 1626 would traverse the SH 45SW interchange without a stop condition.

West of FM 1626 the two eastbound SH 45SW lanes would connect with a single-lane connection from southbound FM 1626 and continue parallel for approximately 1,525 feet then merge to two westbound lanes.

No Build Alternative

Although the No Build Alternative does not meet the purpose and need of the proposed project, it is carried forward in the FEIS to assess the consequences of no action.

2.4 Identification of the Preferred Alternative

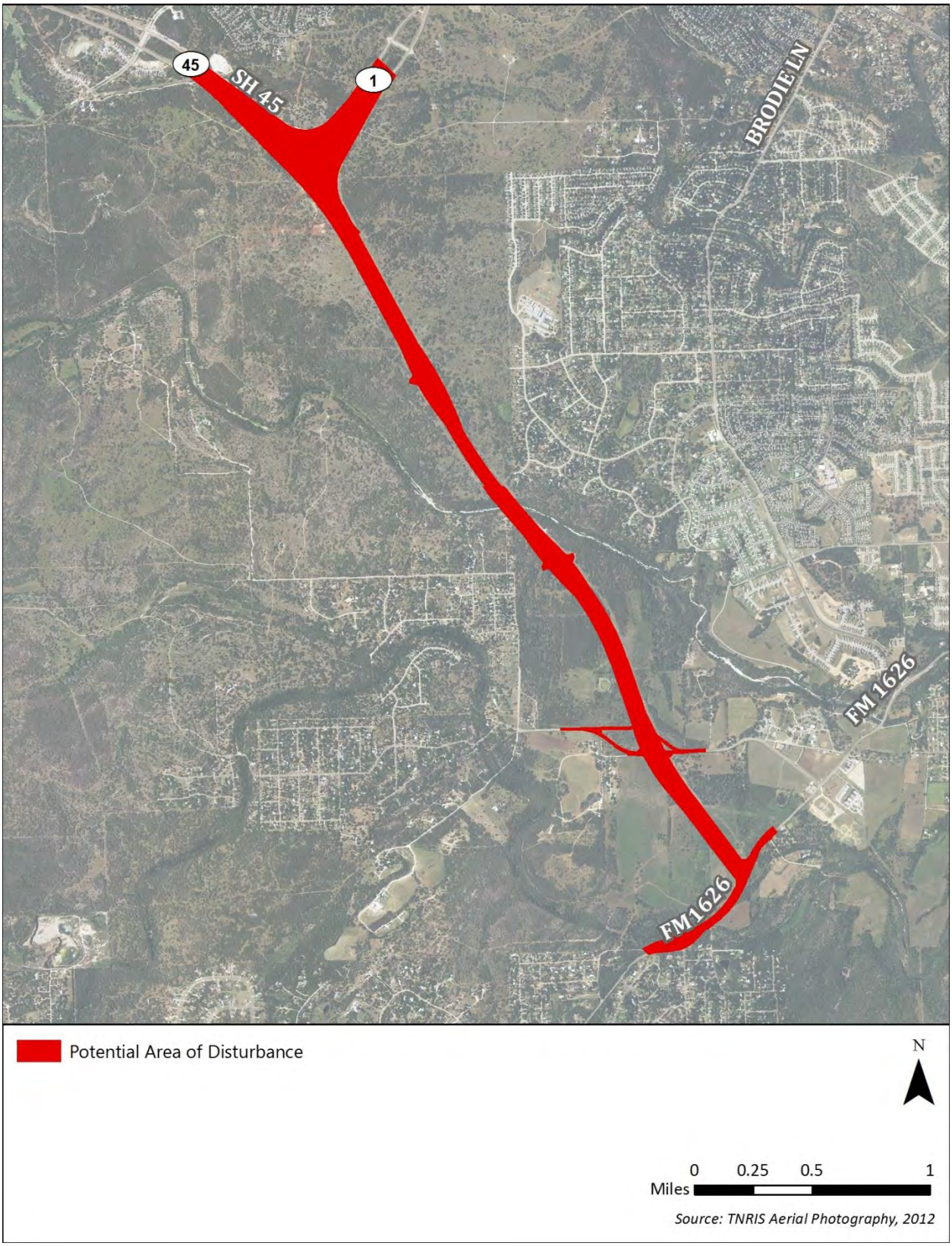
The New Tollway on Existing State-Owned ROW Alternative is the only alternative that is both reasonable and meets the purpose and need of the proposed project. **Sections 3.0** and **4.0** of the FEIS include an evaluation of the Build and No Build Alternatives in terms of their direct, indirect, and cumulative effects on the natural and human environments. Based on the Build Alternative's ability to meet the purpose and need and its effects on the human and natural environments, and after considering public input, the New Tollway on Existing State-Owned ROW Alternative was identified as the Preferred Alternative. **Figure 2.4-1** shows the potential area of disturbance within the ROW associated with the Preferred Alternative. The Preferred Alternative would encompass approximately 311.65 acres in the existing ROW associated with MoPac, SH 45, Bliss Spillar Road, Old Bliss Spillar Road, and FM 1626, as well as along the undeveloped ROW currently owned by TxDOT that lies between MoPac and FM 1626. Of these 311.65 acres, approximately 161 acres would be disturbed. TxDOT would mark areas outside the active construction zone and protect them from disturbance. **Table 2.4-1** lists the acreage associated with each section of the Preferred Alternative's alignment.

Table 2.4-1: Acreage Encompassed by the Build Alternative

Section	Maximum Potential Acres Encompassed by the Build Alternative
MoPac	49.24
SH 45	61.95
SH 45SW	167.12
Bliss Spillar Road	2.16
Old Bliss Spillar Road	6.43
FM 1626	11.84
FM 1626 Transition	12.91
Total	**311.65***

**Total acreage in the DEIS was 309.1 acres. After review of survey materials, however, 2.56 acres of scenic easements at Bear Creek were shown to be part of the state-owned ROW. These 2.56 acres have been added to the state-owned ROW for SH 45SW in the FEIS.*
Source: CPY, 2014

Figure 2.4-1: Acreage Encompassed by the Build Alternative



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3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

Section 3.0 describes the existing conditions of the natural and human environments that would potentially be affected by the proposed project. Direct impacts associated with the Build Alternative are analyzed for each resource or condition. Encroachment-alteration effects that may result from the Build Alternative are also discussed for each resource or condition. Encroachment-alteration effects are a type of indirect impact, removed from the proposed project in both time and distance, and are defined as those impacts that alter the behavior and functioning of the physical environment. Direct impacts are assessed by resource within the proposed project study area (shown in **Figure 3.1-1**); encroachment-alteration impacts are assessed within the proposed project's Area of Influence (AOI). The boundaries of the AOI are Slaughter Lane to the north, RM 1826 to the west, RM 967 to the south, and IH 35 to the east, encompassing roughly 41,674 acres. Figures showing the AOI and more information on how it was delineated can be found in the ***Indirect Impacts Technical Report*** in **Appendix D**.

3.1 Land Use

Section 3.1 describes land use for the proposed project study area, including past development patterns, existing and proposed land uses, and local government plans and policies that may affect the area. Encompassing approximately 5,327 acres (8.3 square miles) in northern Hays and southern Travis counties, the study area contains portions of the city of Austin and its extraterritorial jurisdiction (ETJ) – which includes Shady Hollow and Manchaca census designated places (CDPs) – and unincorporated land in Hays County that falls within the ETJs of the cities of Hays and Buda (**Figure 3.1-1**).

3.1.1 Existing Conditions

Development patterns in the study area transition from urbanized in the northeast to undeveloped, protected open space in the center and west. Much of the developed land in the study area is located in South Austin and Shady Hollow (an unincorporated neighborhood within Austin's ETJ) and is characterized by single family residential subdivisions with commercial development sited along arterial roadways. In the Hays County portion of the study area, development is predominantly low density residential. In the west, protected WQPLs constitute most of the land area, with some existing and planned residential developments at the intersection of MoPac and SH 45 (**Figure 3.1-2**).

Historical Development Patterns

The Austin metropolitan statistical area (MSA) has experienced rapid growth during the last few decades, its population skyrocketing from 585,051 in 1980 to 1,834,303 in 2012 (A&M

Real Estate Center; Census, 2013). The city of Austin itself also grew, and as its population increased, its boundaries expanded further across Travis County, increasing the city's area 142 percent from 1980 to 2009 (COA, 2010a). This rapid growth and expansion resulted in increased development of rangeland and open space, such that an average of approximately 7,600 acres of rangeland in the MSA was developed each year between 1983 and 2000 (COA, 2010a). In keeping with these trends, Census data indicate that the majority (94 percent) of homes in the South Austin/Travis County portion of the study area were constructed during the last three decades (Census, 2012). Study area lands within Austin city limits were annexed by the City in the 1990s and 2000s (COA, 2010a).

As part of the metropolitan area, Hays County also experienced substantial growth between 1980 and 2010. During this period, the county's population increased nearly four-fold, making it one of the fastest growing counties in the nation (Hays County, 2013). The county's population is expected to more than double within the next two decades (Hays County, 2013). Much of the growth that has taken place in Hays County municipalities like Buda has occurred in just the last two decades and was driven by the overall expansion of the Austin metro area.

Figure 3.1-1: Jurisdictions in Study Area

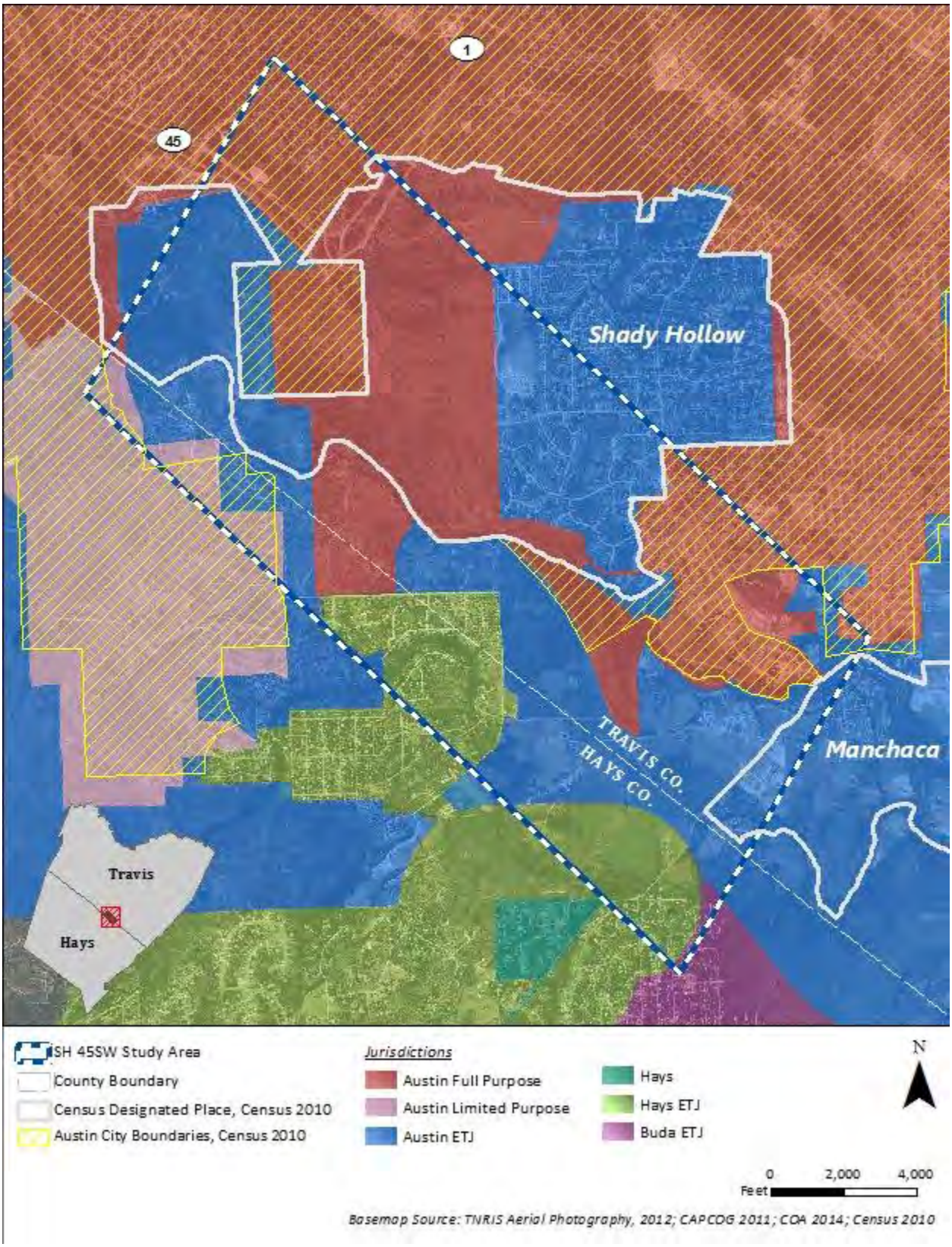

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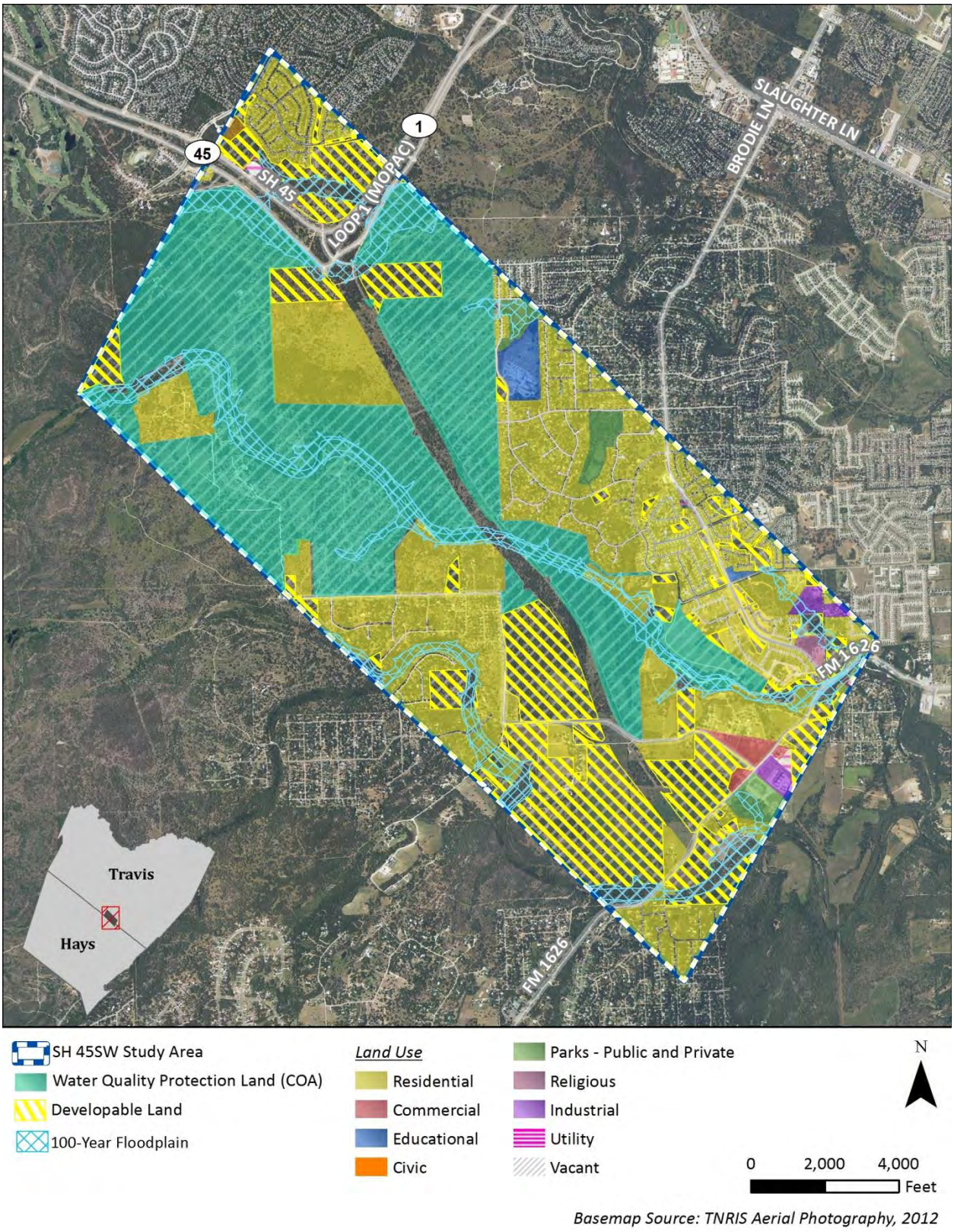
Figure 3.1-2: Existing Land Use in Study Area



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Existing Land Uses

As shown in **Figure 3.1-2**, the study area encompasses approximately 5,327 acres and is comprised mostly of residential development and undeveloped land, much of which is protected from development as WQPLs.

Existing land uses in the study area were identified through aerial photograph interpretation, geospatial data and planning documents provided by municipal jurisdictions within the area's boundaries, and visual surveys. See **Table 3.1-1** and **Figure 3.1-2** for general land use types within the study area. Acreages for existing land uses have changed since publication of the DEIS as WQPL acreages were updated and land that had been incorrectly categorized as developable was correctly characterized as parks/protected lands as a result of agency comments.

Developed lands (comprised of residential, commercial, industrial, utility, and civic uses and roadways) constitute approximately 45 percent of the study area. The primary land use type for developed land in the study area is residential. The majority of the study area is comprised of protected land/open space. Parks and protected lands account for over one-third of the land in the study area and are the most common land use in terms of acreage. COA's WQPLs comprise most of these protected lands and are protected from development in perpetuity to maintain the quality and productivity of the Edwards Aquifer. These WQPLs account for approximately 1,820.98 acres, or 34 percent, of the total study area. Removing the parks, protected lands, and undeveloped land in the 100-year floodplain from the study area's acreage of vacant land leaves only 17 percent (909.61 acres) of the study area open for possible future development (**Figure 3.1-2**). These developable lands are concentrated mostly in the southeastern portion of the study area in unincorporated Hays County.

Table 3.1-1: General Land Use within SH 45SW Study Area

Land Use Type	Acreage	Percent of Study Area	Notes
Undeveloped Land	**2,974.54**	**55.46%**	**Includes both undevelopable (parks/protected lands and vacant land in the floodplain) and developable (vacant land outside the floodplain) lands**
Parks/Protected Lands	1,900.33	35.43%	Includes parks, open space, and WQPLs
Vacant	1,074.21	20.03%	Undeveloped land not part of preserved lands or parks (includes land within the 100-year floodplain)
Developed Land	**2,388.43**	**44.54%**	**Includes residential, roadways, utility, civic/institutional, industrial, and commercial uses**
Residential	1,686.88	31.45%	Comprised almost exclusively of single family homes
Roadways/ROW	557.69	10.40%	Includes existing roadways and ROW (including state-owned ROW)
Utility	28.14	0.52%	Includes utility areas and existing Lower Colorado River Authority (LCRA) ROW not overlapped by WQPLs
Civic/Institutional	59.53	1.11%	Encompasses educational, religious, civic and institutional uses, including schools, places of worship, and public facilities
Industrial	30.81	0.57%	Comprised of warehouses located in the eastern end of the study area
Commercial	25.38	0.47%	Clustered around major arterials in the study area; includes retail, convenience stores, and other commercial businesses
Total	**5,326.97**	**100.00%**	

Acreages for existing land uses have changed since publication of the DEIS as WQPL acreages were updated and land that had been incorrectly categorized as developable was correctly characterized as parks/protected lands as a result of agency comments.
Sources: COA, 2010b; City of Buda, 2013; TxDOT, 2013; Capital Area Council of Governments, 2010.

Local Plans and Policies

There are several entities responsible for land use and transportation planning in the study area, including COA, Travis and Hays counties, and CAMPO. The following local plans were reviewed for their potential influences on land use within the study area: *Imagine Austin*; *2025 Austin Metropolitan Area Transportation Plan; Hays County Transportation Plan; Travis County Parks and Natural Areas Master Plan; Travis County Draft Land, Water, and Transportation Plan; Hays County Parks, Open Space and Natural Areas Master Plan;* and CAMPO's *2035 RTP*.

City of Austin

Eighty-eight percent of the study area lies within COA's jurisdiction or ETJ. Much of this land is part of COA's full purpose jurisdiction, but over 2,300 acres (45 percent) of the study area lies within COA's two-mile ETJ, where COA has no zoning authority but where development is subjected to subdivision and water/wastewater regulations and joint city-county review. Non-subdivision development is subject to separate development permits by COA and Travis County. In unincorporated areas, such as land within the ETJ, Travis County and COA have authority over wastewater discharges as Municipal Separate Storm Sewer Systems (MS4s). Land within a city's ETJ may be annexed in the future, bringing development in these areas under the city's zoning and permitting requirements. Discussions over possible future annexation of the Shady Hollow CDP are ongoing between COA and the Shady Hollow Municipal Utility District (MUD), which provides water and wastewater services to the Shady Hollow CDP. As of September 2013, COA is anticipated to assume responsibility for water and wastewater service in Shady Hollow in 2018; full services are anticipated to be extended to the area in 2020 (Gonzalez, 2013).

Imagine Austin (COA, 2010a), the city's comprehensive plan, provides a vision to guide growth and development within the city's boundaries over the next 30 years. *Imagine Austin* incorporates adopted neighborhood plans as well as the Growth Concept Map to guide future land use plans. The Growth Concept Map included in the approved comprehensive plan indicates future open space along riparian corridors within the study area. The nearest activity center, designated as an area for concentrating future development, is located at Slaughter Lane and Manchaca Road, outside the proposed project's study area. The *Imagine Austin* plan also contains future roadway, bicycle and pedestrian, and transit network maps. These maps indicate that future transportation networks in the study area will include urban trails and portions of the Violet Crown Trail, as well as improvements to Frate Barker Road, FM 1626, Manchaca Road, and Hewitt Lane.

After adopting the plan in 2012, Austin City Council voted to remove the proposed project from *Imagine Austin*, making the proposed project inconsistent with the city's local land use planning efforts. However, the land within the study area is not located within a

neighborhood planning area and thus has no approved neighborhood plans with future land use designations. Therefore, because the Imagine Austin plan's future land use recommendations rely on the goals and recommendations of adopted neighborhood plans, no future land use designations currently apply to the land within the study area.

COA has enacted several watershed protection ordinances over the last three decades to protect water quality through land use and development decisions. To this end, the western Drinking Water Protection Zone (DWPZ) – in which the study area is located – and the eastern Desired Development Zone (DDZ) were created with the goal of funneling development into the DDZ through use of development incentives. This goal of directing growth east and south into the DDZ is seen in both *Imagine Austin* (adopted in 2012 to guide growth and development in the COA), and in the City's WQPL program, which has purchased or placed easements on over 26,000 acres of land in the western part of the metro area to protect the quality and quantity of water in Barton Springs and the Edwards Aquifer.

The *2025 Austin Metropolitan Area Transportation Plan* (2004) guides future transportation planning in Austin and identifies the proposed project as a four-lane parkway extending from MoPac to FM 1626 at the Travis-Hays county line (COA, 2004).

Travis County

The land within the study area located in Travis County also falls within Austin's ETJ. However, because this land is not yet incorporated into the City's full or limited purpose jurisdictions, county subdivision, water/wastewater, and other health- and safety-related ordinances apply. Texas counties have no zoning or land use planning authority; however, the draft *Land, Water, and Transportation Plan* (approved for public review and comment on July 1, 2014) and the *Travis County Parks and Natural Areas Master Plan* were analyzed in light of the proposed project.

The draft *Land, Water, and Transportation Plan* emphasizes implementing a similar growth concept to that used in *Imagine Austin* and the CAMPO RTP: focusing future development within activity centers and along transportation corridors. The plan shows FM 1626 within the project area as a transportation corridor. Other general goals of the plan include research on maintaining dark skies, preserving farmland, maintaining scenic roadways, and promoting best practices in land conservation, as well as utilizing various regional programs for strategic planning and analysis, and reporting on growth monitoring and impacts (Travis County, 2014).

The *Travis County Parks and Natural Areas Master Plan* guides the development and maintenance of Travis County's system of parks and natural areas for the next decade. The proposed project's study area falls within the Southwest Planning Area, an area of approximately 277 square miles (Travis County, 2010). Planning priorities within this area include acquiring land for a Southwest Metro Park (Travis County, 2010). However, the

proposed area for constructing the metro park is located to the northwest of the study area, near Milton Reimers Ranch Park (Travis County, 2005). Therefore, the goals of the *Travis County Parks and Natural Areas Master Plan* are unlikely to affect land use within the proposed project study area.

Hays County

Approximately 643 acres of the study area lie outside the boundaries of the city of Austin or its ETJ, mostly within Hays County; 188 of these acres are developable land (i.e. undeveloped land that is not protected parkland or WQPLs and lies outside the 100-year floodplain). Because programs like COA's WQPLs and DDZ incentives seek to manage growth in the environmentally sensitive lands within the study area, anticipated future population growth and development in the area will likely be funneled to these vacant, developable lands. Hays County recognizes that this future growth will put pressure on the existing transportation system. The *Hays County Transportation Plan* (2013) cites this anticipated future growth and its resultant impacts on traffic congestion as contributing to an increased need for new and improved roadway facilities. The plan identifies SH 45SW as a potential connector between MoPac and IH 35.

The *Hays County Parks, Open Space, and Natural Areas Master Plan* (2012), like its Travis County counterpart, is used to guide decision making for the County's parks and open space programs and facilities. According to the plan, there are no priority projects located in the study area.

Capital Area Metropolitan Planning Organization

CAMPO is responsible for transportation planning in the six-county Austin metro region, which includes Hays and Travis Counties. The organization's most recent long range plan update, the *2035 RTP* (2010), identifies SH 45SW as a four-lane tolled freeway from MoPac to FM 1626. Although the CAMPO 2035 RTP identifies SH 45SW from FM 1626 to IH 35 for environmental and preliminary engineering analysis, no funds have been identified for such studies, much less for construction of that roadway. Therefore, SH 45SW from FM 1626 to IH 35 is not reasonably foreseeable.

Proposed Land Uses

Approximately 17 percent (909.6 acres) of the study area is comprised of vacant, developable lands outside the 100-year floodplain, the remainder consisting of protected open space, developed land, or undeveloped land within the 100-year floodplain (**Figure 3.1-2**). Because much of the study area is comprised of already developed land or protected WQPLs where development is precluded, future development and changes in land use are anticipated to occur mostly in the southeastern portion of the study area where vacant, developable land is concentrated (see **Existing Land Uses**).

Because counties in Texas lack zoning and land use planning authority, land in the unincorporated parts of Travis and Hays counties (including land in the boundaries of cities' ETJs) is not subject to the municipalities' zoning requirements, although the land may be annexed into the jurisdictions' full purpose boundaries in the future, and in Travis County, the County and COA exercise joint jurisdiction over environmental review and development permits. In light of these circumstances, specific plans regarding the potential future land use of much of the study area, which lies outside municipal planning boundaries, is unavailable. However, indications of future development can be gathered from existing plans, policies, and development proposals. This section describes possible future land use types and developments in the study area, based on a review of local plans and proposed and platted development projects.

Although 88 percent of the land within the study area falls within the boundaries of the city of Austin or its ETJ, the portion of the study area within Austin city limits is not located within a neighborhood planning area, and thus does not have an approved neighborhood plan with future land use designations. According to the overall growth concept map contained in *Imagine Austin* (COA, 2012), no activity or development centers are planned within the study area, with the closest planned activity center being a neighborhood center at the intersection of Slaughter Lane and Manchaca Road.

According to COA Planning and Development Review Department's *Emerging Projects* report (November 2013) and information from other jurisdictions in the study area, portions of several planned developments fall within the study area (**Table 3.1-2** and shown in **Figure 3.1-3**).

Table 3.1-2: Proposed Developments in the SH 45SW Study Area

Development Name	Location	Description	Status
Avana	South of county line and east of the planned extension of Escarpment Blvd	Upscale residential development with) 800 homes; 250-room hotel; 140 condos; 18-hole golf course	Approved
The Hills of Shady Hollow	East side of FM 1626 at Johnson Ln	77-acre mixed use development; 208 single family homes; 35 acres of open space; 5 acres of retail	Approved
Greyrock Ridge Commons	East of county line and south of SH 45 along greenbelt	177-acre residential development; 387 single family homes; 55 acres of open space	Active
Slaughter 100 Tract 14A	At intersection of MoPac and SH 45	36-acre office development	Approved
Dakota Springs/Marbridge Estates	South side of intersection of Brodie Ln and FM 1626	112.5-acre residential development; 301 single family homes; 33.5 acres of open space	Active
Shady Hollow Gardens	North side of intersection of Brodie Ln and Frate Barker Rd	35.5-acre residential development; 144 townhomes	Active
Veritas Academy	Within the Avana development, at the county line west of the Escarpment Blvd extension	91-acre site within the Avana development that will contain a 57,500 sq. ft. private school	In Review
Hays Commons	West of FM 1626 at the county line	53.2 acres of rural residential development, 113.2 acres of retail, and 113 acres of parkland	Planned
Hill Country Corners	North of MoPac and SH 45 intersection	Approximately 25 acres for an office or commercial development	Planned
Violet Crown Trail	Potential route of phase III could bisect area between RM 1826 and Brodie Ln	30-mile-long hiking trail along the Barton Creek Greenbelt and through WQPLs	Planned

Sources: COA, Nov 2013; A. Ross, personal communication, Feb 8, 2012; City of Hays, 2013; W. Walters, personal communication, Apr 24, 2014.

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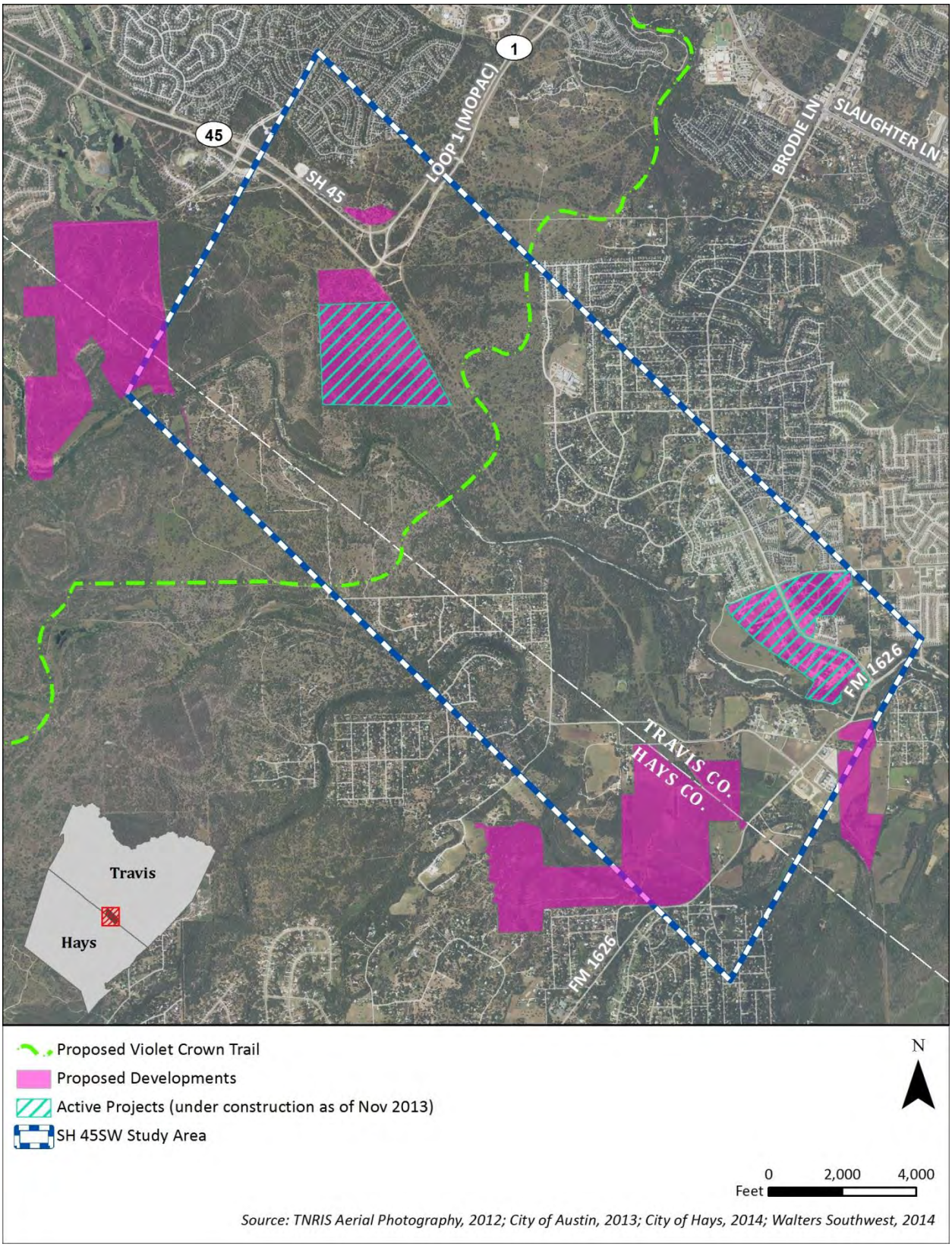
Figure 3.1-3: Proposed Developments in the Study Area



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The developer of the proposed Hays Commons development has stated that approximately 214 acres of land along the west side of the proposed project's ROW near Bliss Spillar Road may be purchased by the HCC for conservation. If this land is not purchased for conservation purposes, a commercial and multifamily development may be sited in the area. If constructed, this development would adhere to COA water quality regulations (W. Walters, personal communication, April 24, 2014). More information on these proposed developments can be found in **Appendix D: *Indirect Impacts Technical Report***.

In the absence of future land use plans specific to the lands within the ETJs of Hays and Buda, potential future land uses can be inferred from these jurisdictions' local plans and policies. The bearing these plans may have on future development are discussed in the following section.

3.1.2 Direct Effects

Build Alternative

As previously stated, the ROW for the Build Alternative was acquired by Travis and Hays counties in 2003 and 2005, respectively, and was then deeded to the State of Texas. Because the ROW already exists as highway ROW, no conversion of land from non-transportation uses to a transportation use would occur with the construction of the proposed project.

During construction, short-term impacts to land uses adjacent to the Build Alternative would occur due to the location of temporary work spaces and construction activities. The specific locations of the temporary work spaces are not yet known. However, the contractor would be required to obtain permits and approvals for any temporary work areas outside the project ROW. It is not anticipated that COA would permit any such activity in the established WQPLs. Any land affected during construction would be restored to pre-construction conditions upon completion of construction, where practicable.

The direct impacts to land use associated with the Build Alternative are concluded to be not significant. Further, any direct impacts that would occur outside the ROW would be anticipated to be temporary and associated with construction.

No Build Alternative

The No Build Alternative would not directly affect land use within the study area.

3.1.3 Encroachment-Alteration Effects

Due to the lack of frontage roads associated with the Build Alternative and the prevalence of WQPLs (protected from development in perpetuity) along most of the route, encroachment-alteration impacts to land use are not anticipated as a result of the Build Alternative. While development is already occurring in the area, as evidenced by the planned

developments shown in **Table 3.1-2**, as a new location roadway, the proposed project may result in induced growth and development in the area. These indirect impacts and the effects associated with such induced growth are discussed in **Appendix D: *Indirect Impacts Technical Report*** and summarized in **Section 4.0**.

3.2 Socioeconomic Resources

Section 3.2 discusses the social and economic conditions within the study area, focusing on demographic, employment, and income characteristics, and community facilities and resources. Five census tracts cross the boundaries of the study area: four in Travis County and one in Hays County (**Figure 3.2-1**). These tracts encompass portions of the cities of Austin, Buda, and Hays. Within these census tracts, there are 12 block groups and 456 census blocks (368 of which contain resident populations). Socioeconomic information was collected from the US Census Bureau 2010 decennial census and the 2008-2012 American Community Survey (ACS). It should be noted that the data contained in the ACS are estimates, not actual counts.

3.2.1 Existing Conditions

To provide context on existing socioeconomic conditions in the study area, demographic and economic information on the residents of the study area are presented and descriptions of the communities, public facilities, and community resources within the study area are given. These conditions are discussed below.

Population Trends

The Austin area has experienced significant and sustained growth over the last two decades, with the populations of Hays and Travis counties increasing by 139 percent and 78 percent, respectively, over the period 1990 to 2010 (US Census, 1990, 2010). In 2012, Hays County was the nation's third fastest-growing county as measured by change in housing units from 2010 to 2012 (US Census, 2012). Travis County was the state's seventh fastest-growing county by percent increase in population over the same period (US Census, 2013a). Population change for Travis County, Hays County, and the study area is shown in **Table 3.2-1**.

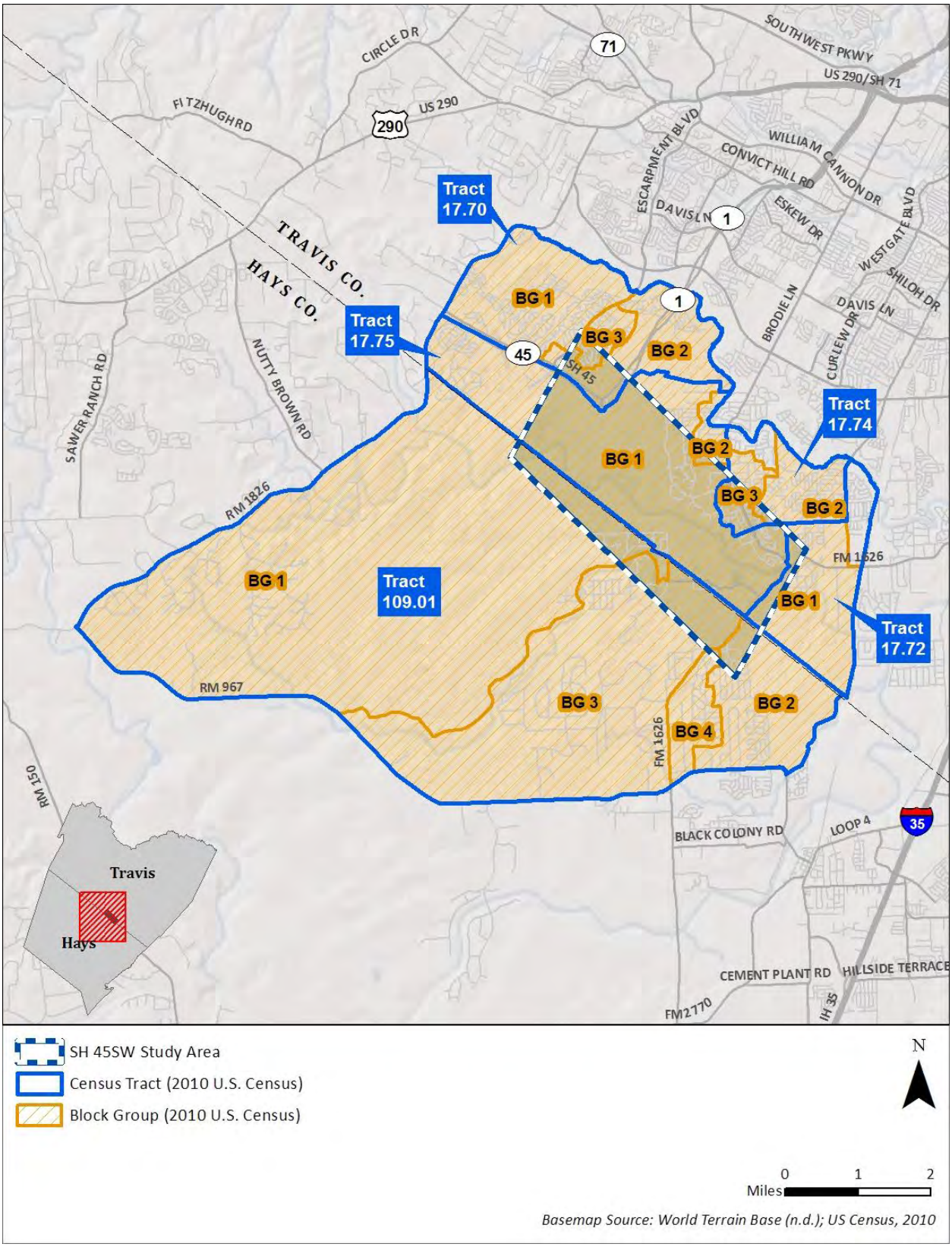
Table 3.2-1: Population Trends within Region and SH 45SW Study Area

Year	Hays County		Travis County		Study Area*	
	Population	Percent Change by Decade	Population	Percent Change by Decade	Population	Percent Change by Decade
1990	65,614	--	576,407	--	10,378	--
2000	97,589	49%	812,280	41%	19,876	92%
2010	157,107	61%	1,024,266	26%	35,415	78%

**Study area composed of 2010 census tracts 17.70, 17.72, 17.74, 17.75, 109.01*

Source: US Census Bureau, Total Population, 1990, 2000, 2010.

Figure 3.2-1: Census Geographies in Study Area



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Race/Ethnicity

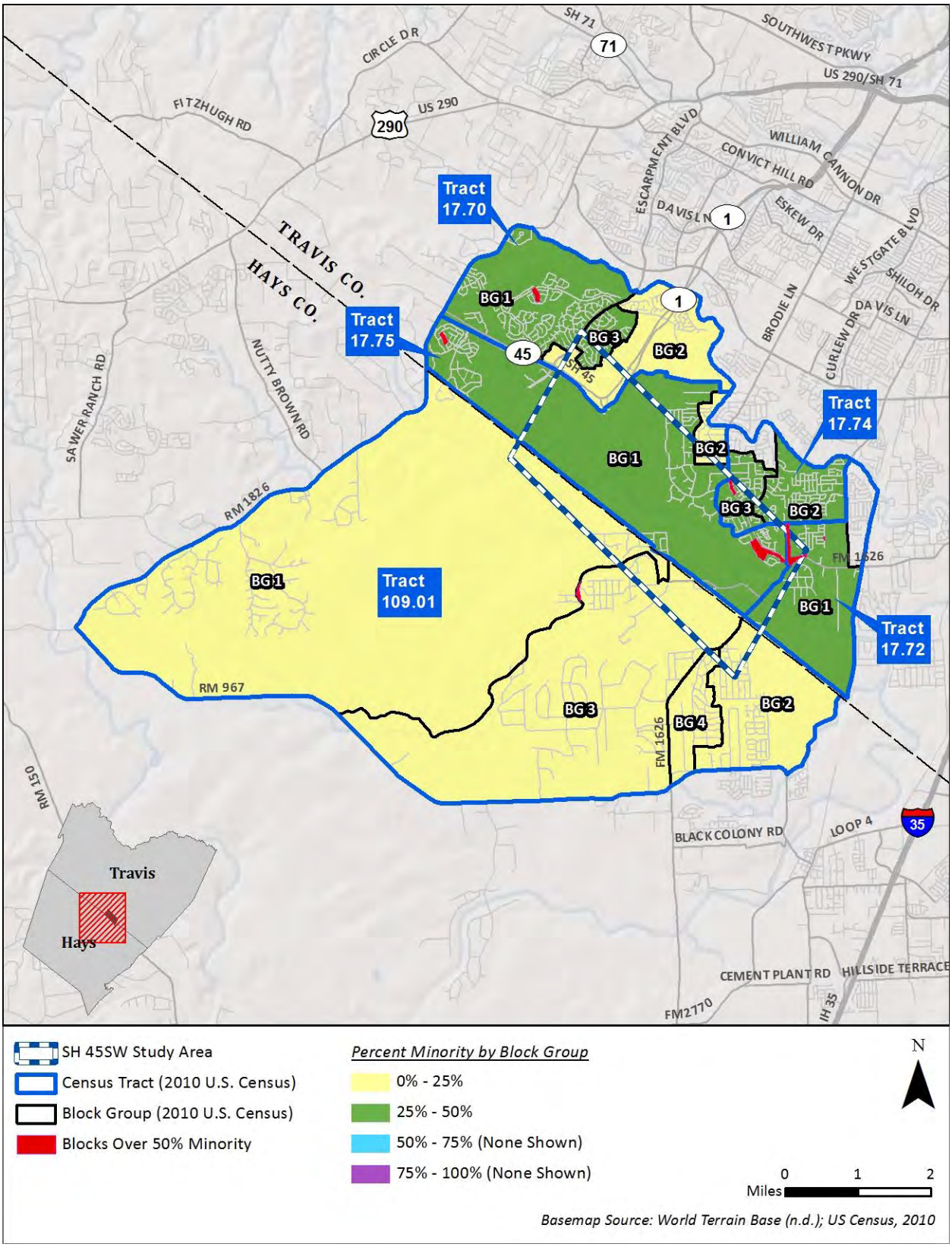
Table 3.2-2 shows the racial and ethnic composition of the study area population at the tract and block group levels. Minority populations include all those racial and ethnic groups that are not White, Non-Hispanic. One census tract in the study area contains a minority population over 50 percent (census tract 17.72). However, only block group 1 of this tract is located in the proposed project study area. This block group contains 40 percent minority residents. Overall, minority populations account for 29 percent of the study area population. Hispanic or Latino (of any race) is the largest minority group, accounting for 18 percent of the entire population and 62 percent of the minority population. Eight blocks (2.2 percent of all the populated blocks in the study area) contain minority populations that comprise over 50 percent of their total resident populations. **Figure 3.2-2** shows percentage of minority residents by block group and those blocks with over 50 percent minority residents. Race and ethnicity information by block is included in **Appendix E: Census Data**.

Table 3.2-2: Percentage of Population in SH 45SW Study Area by Race and Ethnicity

Census Tract	Block Group	Total Population	Not Hispanic or Latino							Hispanic or Latino	Total Minority (All Not White, Non-Hispanic)
			White	Black or African American	American Indian or Alaskan Native	Asian	Native Hawaiian or Pacific Islander	Other Race	Two or More Races		
17.70	--	11,417	73.7%	1.7%	0.2%	10.8%	0.0%	0.2%	2.0%	11.5%	26.3%
	1	6,933	72.5%	1.6%	0.3%	11.3%	0.0%	0.2%	1.8%	12.3%	27.5%
	2	2,155	77.0%	2.6%	0.1%	8.5%	0.0%	0.4%	1.9%	9.6%	23.0%
	3	2,329	73.9%	1.1%	0.2%	11.3%	0.0%	0.3%	2.7%	10.6%	26.1%
17.72	--	3,095	46.7%	3.2%	0.4%	4.7%	0.2%	0.1%	1.5%	43.3%	53.3%
	1	1,308	59.9%	2.5%	0.2%	5.4%	0.5%	0.1%	1.8%	29.6%	40.1%
17.74	--	8,161	59.8%	3.7%	0.2%	5.9%	0.1%	0.1%	1.9%	28.2%	40.2%
	2	4,910	51.9%	4.4%	0.2%	6.3%	10.0%	0.0%	2.1%	35.0%	48.1%
	3	2,134	70.4%	2.7%	0.2%	6.5%	0.3%	0.2%	1.0%	18.7%	29.6%
17.75	--	4,973	73.7%	2.1%	0.3%	6.9%	0.1%	0.1%	1.7%	15.1%	26.3%
	1	4,201	72.7%	2.1%	0.2%	8.1%	0.1%	0.1%	1.9%	14.9%	27.3%
	2	772	79.0%	2.2%	1.0%	0.4%	0.1%	0.0%	0.8%	16.5%	21.0%
109.01	--	7,769	79.5%	1.6%	0.1%	0.8%	0.0%	0.1%	1.3%	16.6%	20.5%
	1	1,589	83.2%	1.5%	0.2%	1.4%	0.1%	0.0%	1.6%	12.0%	16.8%
	2	2,270	78.6%	1.6%	0.2%	0.7%	0.0%	0.0%	1.2%	17.7%	21.4%
	3	2,863	78.2%	1.9%	0.1%	0.7%	0.0%	0.1%	1.3%	17.6%	21.8%
	4	1,047	79.1%	0.7%	0.1%	0.5%	0.0%	0.0%	1.2%	18.4%	20.9%
Study Area Total*		35,415	69.4%	2.3%	0.2%	6.4%	0.1%	0.1%	1.8%	16.5%	30.6%
Travis County		1,024,266	50.5%	8.1%	0.3%	5.7%	0.1%	0.2%	1.7%	33.5%	49.5%
Hays County		157,107	58.6%	3.2%	0.3%	1.1%	0.1%	0.1%	1.4%	35.3%	41.4%

**Study area totals based on census tracts*
Source: US Census. 2010. Summary File 1, "Race, Combinations of Two Races, and Not Hispanic or Latino" (QT-P4).

Figure 3.2-2: Minority Populations in Study Area



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Median Household Income and Poverty Status

Income data from the 2008-2012 ACS was used to determine median household income at the block group level, the lowest level for which income information is collected. **Table 3.2-3** shows income data for the census tracts and block groups within the study area. The ACS measures income over a period of five years (2008-2012); the numbers shown in the table represent an average of those sampled over that period.

Table 3.2-3: Median Household Income

Tract	Block Group	Median Household Income (2012$)
17.70	--	$134,792
	1	$143,697
	2	$137,796
	3	$102,065
17.72	--	$68,333
	1	$69,625
17.74	--	$98,606
	2	$91,082
	3	$119,267
17.75	--	$111,250
	1	$123,269
	2	$90,283
109.01	--	$118,750
	1	$83,359
	2	$124,656
	3	$117,466
	4	$103,456
Travis County		$56,403
Hays County		$57,834

Source: US Census, ACS, 2008-2012 "Median Household Income in 2012 Inflation-Adjusted Dollars" (B19013).

The United States Department of Health and Human Services' (DHHS) poverty guideline for a family of four in 2012 was $23,050. A four-person family earning less than this amount is considered to be below the poverty level. Comparing this poverty guideline to the median household income of the study area block groups from 2008-2012, no block group exhibited a median household income below the poverty level. The DHHS guideline for 2014, the most recent poverty guideline available, is $23,850. No block group in the study area exhibited a median household income below this more recent poverty guideline.

Poverty rates for the census tracts (the smallest level of geography for which this data is most recently available) within the study area are substantially lower than in Travis or Hays

counties as a whole. The poverty rate in the study area as a whole is 2.2 percent. The highest poverty rate in the study area is five percent in census tract 17.74, over 10 percentage points lower than the rates for Travis or Hays counties (**Table 3.2-4**).

Table 3.2-4: Poverty Rates by Census Tract

Census Tract	Population for whom Poverty Status determined	Persons below Poverty	Percentage of Population below Poverty
17.70	11,480	195	1.7%
17.72	2,821	20	0.7%
17.74	7,953	398	5.0%
17.75	4,865	54	1.1%
109.01	7,811	112	1.4%
Travis County	1,015,389	177,147	17.4%
Hays County	151,048	25,440	16.8%

Source: US Census, ACS, 2008-2012, "Poverty Status in the Past 12 Months" (S1701).

Environmental Justice

Executive Order (EO) 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Although this EO only applies to federal agencies, TxDOT's environmental process generally mirrors that of the federal government and federal guidance can be useful in assessing certain socioeconomic impacts, including environmental justice (EJ). The Federal Highway Administration (FHWA) has identified three fundamental principles of EJ (FHWA, 2012).

The three fundamental principles of EJ are:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations, and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process;
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

Disproportionately high and adverse human health or environmental effects are defined as adverse effects that:

- are predominately borne by a minority population and/or a low-income population; or
- will be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the nonminority population and/or non-low-income populations.

Minority means a person who is:

- Black (having origins from any of the black racial groups of Africa);
- Hispanic/Latino (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
- Asian-American (having origins from any place of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); or
- American Indian and Alaskan Native (having origins from any of the original people of North America and now maintaining cultural identification through tribal affiliation or community recognition).

Minority Population means any readily identifiable group of minority persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed program, policy, or activity. Minority populations were identified based on the federal Council on Environmental Quality's (CEQ's) guidance document *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ, 1997). Based on this guidance:

> "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis…"

Low-Income means a household income at or below the DHHS guidelines (i.e. $23,850 in 2014).

Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed program, policy, or activity.

Unlike the CEQ guidance (1997) on minority population, no EJ order or guidance document contains a quantitative definition of how many low-income individuals constitute low-income populations. In the absence of guidance for the analysis, one of the measures used to identify low-income populations was the median household income for the census tracts and

block groups within the study area. As described above, the FHWA defines low-income as "a person whose household income level is at or below the DHHS poverty guidelines." In 2014 (the most recent year available), DHHS poverty guidelines for a family of four persons was $23,850.

To determine the presence of EJ populations in the study area, data on race, ethnicity, and income were collected from the 2010 Census and the 2008-2012 ACS. As discussed in the **Median Household Income and Poverty** section, the study area is located in a relatively affluent portion of the region, with no block group's median household income falling below the most recent DHHS poverty guideline (**Table 3.2-3**). Percentages of minority populations in the study area by census tract and block group are listed in **Table 3.2-2**. One census tract (17.72) has a minority population over 50 percent; however, only block group 1 of this census tract is located within the proposed project study area. This block group contains 40 percent minority residents. There are 368 populated blocks within the proposed project study area. Of these, eight contain over 50 percent minority residents. Six of these blocks are located in census tracts in Travis County; two are located in Hays County (**Figure 3.2-2**).

Language and Limited English Proficiency (LEP)

To determine the dominant languages spoken in the study area, the 2008-2012 ACS five-year estimates at the block group level were used. This data is depicted in **Table 3.2-5**. The majority of residents speak only English at home, with Spanish the second most commonly spoken language.

Table 3.2-5: Language Spoken at Home and LEP Population within SH 45SW Study Area

Census Tract	Block Group	Population 5 years and older	English Only	Spanish	Other Indo-European	Asian and Pacific Islander	Other	Speak English Less Than Very Well
17.70	1	6,432	85.3%	5.6%	3.2%	4.4%	1.5%	4.7%
	2	2,242	86.4%	10.4%	0.0%	3.3%	0.0%	0.8%
	3	1,495	73.8%	10.2%	4.9%	7.4%	3.7%	4.3%
17.72	1	1,316	86.5%	6.0%	0.0%	7.5%	0.0%	5.0%
17.74	2	3,968	78.2%	16.0%	1.4%	4.4%	0.0%	6.3%
	3	2,121	82.0%	13.9%	2.1%	2.0%	0.0%	3.6%
17.75	1	3,700	81.2%	10.4%	1.8%	6.6%	0.0%	2.4%
	2	858	88.2%	9.1%	1.6%	1.0%	0.0%	0.0%
109.01	1	1,449	87.2%	4.3%	7.2%	1.3%	0.0%	1.0%
	2	2,485	86.6%	11.7%	1.7%	0.0%	0.0%	1.7%
	3	2,755	90.3%	8.9%	0.5%	0.2%	0.0%	1.3%
	4	870	73.3%	26.7%	0.0%	0.0%	0.0%	3.1%
Study Area		29,691	83.6%	10.2%	2.1%	3.6%	0.5%	3.3%
Travis County		958,478	68.6%	24.3%	2.8%	3.7%	0.6%	13.8%
Hays County		147,847	76.5%	21.1%	1.5%	0.8%	0.1%	6.7%

Source: US Census, ACS 2008-2012, "Age by Language Spoken at Home by Ability to Speak English," (B16004).

EO 13166, "Improving Access to Services for Persons with Limited English Proficiency (LEP)," requires federal agencies to examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so that LEP persons can have meaningful access to them. As in the case of EJ, although state agencies are not required to follow this EO, it provides a useful guide for assessing socioeconomic impacts to LEP populations.

2008-2012 ACS estimates show that 3.3 percent of residents in the study area are considered LEP, speaking English less than very well, with the highest concentration of LEP residents in census tract 17.74, block group 2 (**Table 3.2-5**).

Other Demographic Characteristics

The population within the study area is slightly older than the overall populations of Travis or Hays counties, but contains a similar proportion of residents over 64 years of age. The median age of the study area's population is 40.0 years old, compared to 31.9 years and 30.4

years for Travis County and Hays County, respectively. Residents over 64 years of age account for 7.2 percent of the population in the study area, 7.3 percent of the population in Travis County, and 8.5 percent of the population in Hays County, making the proportion of elderly residents in the study area similar to that of the wider population (US Census, 2010).

The study area is composed of far fewer foreign-born residents than the population of Travis County overall. The study area contains 8.4 percent foreign-born residents, far less than Travis County's 18 percent, but similar to Hays County's foreign-born population (7.2 percent) (ACS, 2008-2012).

Females comprise 50.6 percent of the study area population, compared to 49.6 percent of Travis County's overall population and 50.2 percent of Hays County's overall population (US Census, 2010).

The ACS collects information on disability at the county level. This information is summarized in **Table 3.2-6**.

Table 3.2-6: Disability Status of Civilian, Non-Institutionalized Population (2012)

Geography	Population	With Disability	Percentage with Disability
Hays County	167,464	17,584	10.5%
Travis County	1,087,905	97,251	8.9%
City of Austin	837,661	78,331	9.4%

Source: US Census, ACS 2012, "Selected Social Characteristics in the US," (DP02).

Economic Characteristics

Census data estimates provided in this subsection come from the US Census Bureau's OnTheMap application, which provides information on employment, earnings, industry distribution, and demographics obtained from the Longitudinal Employer-Household Dynamics program. This program obtains information from the ACS which surveys samples of the population, rather than the entire population as in the case of the decennial census. Therefore, the data presented in this subsection should be taken as estimates, not actual counts.

Census estimates from 2011 indicate there are 459 primary jobs located in the study area, with the greatest proportion in the healthcare and social assistance sector (52.1 percent), followed by educational services (9.6 percent), and other services (excluding public administration) (9.6 percent) (US Census, 2013b). A review of businesses in the study area reveals that major employers include the Marbridge Foundation, a private group home for mentally challenged adults in Manchaca; single family housing construction company Porter Co; and Bailey Middle School (Reference USA, 2013). Most workers in the study area make between $1,251 and $3,333 per month (53 percent). However, a greater proportion of workers earn $1,250 or less per month in the study area than in the Austin MSA as a whole (US Census,

2013b). Because median household incomes for residents in the study area are much higher than for residents in the MSA at large, most residents likely work outside the study area.

Residents within the study area tend to travel north and northeast into Austin for work (87 percent) (US Census, 2013b). Fifty-nine percent travel between 10 and 24 miles to work, while 36 percent travel less than 10 miles outside the study area for work in any direction (US Census, 2013b).

Communities

The study area encompasses the following communities (**Figure 3.2-3**), either in whole or in part: South Austin, Shady Hollow CDP, Manchaca CDP, and several subdivisions in unincorporated Hays and Travis counties. Each community is described in the following section, using 2010 Census and 2008-2012 ACS information and site visits.

Austin and Travis County

In 2010, the city of Austin contained 790,491 residents and covered roughly 298 square miles. Within the study area, approximately three square miles fall within COA's full purpose jurisdiction, receiving all city services and subject to all zoning and permitting regulations. This area includes the Circle C neighborhood and several subdivisions located along Frate Barker Road and Brodie Lane, and commercial development along FM 1626. An additional residential development, Greyrock Ridge Commons, is being constructed at MoPac and SH 45.

The neighborhoods within the Austin portion of the study area lie within the boundaries of the following block groups:

- tract 17.70 block group 2,
- tract 17.70 block group 3,
- tract 17.72 block group 1,
- tract 17.74 block group 2,
- tract 17.74 block group 3, and
- tract 17.75 block group 1.

These block groups also include portions of the neighborhoods of Shady Hollow CDP, Manchaca CDP, and subdivisions in Hays County, described below. The combined population of these block groups was 17,037 in 2010. Sixty-six percent of the population of these block groups is White, Non-Hispanic with Hispanic or Latino comprising the largest minority group at 21 percent of the population. Four percent of residents aged five and older are considered LEP. The population in these block groups is slightly younger than in Austin as a whole or in Travis County: 32 percent of residents are under the age of 20; just six percent are over 64. In the city of Austin and Travis County, the population under 20 years old is between 26 and 27 percent and the population over 64 years old is seven percent. The median household income for these block groups in 2012 ranged from $69,625 to $137,796 (US Census, 2010; 2008-2012).

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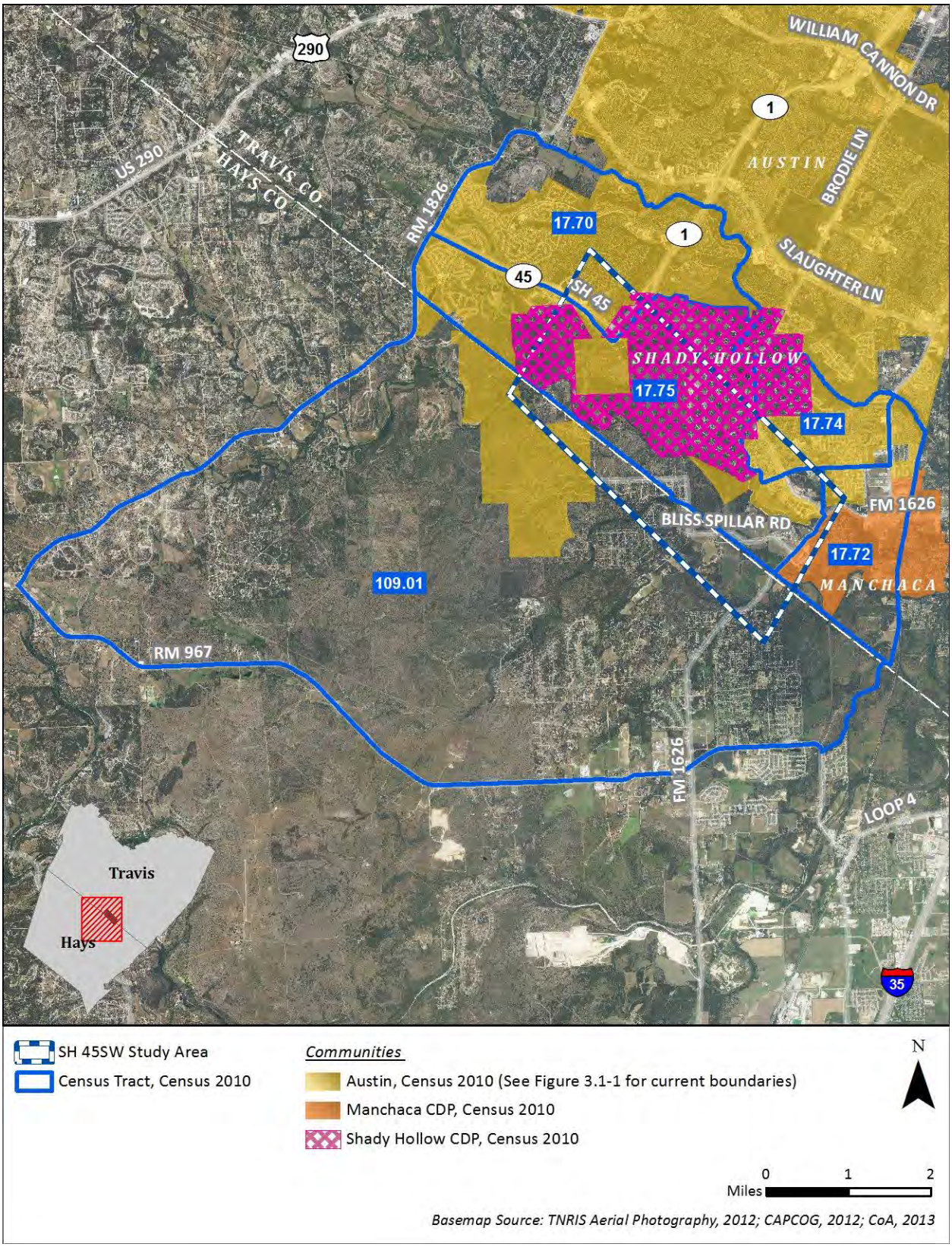
Figure 3.2-3: Communities in Study Area



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There are 5,996 housing units in these block groups; 91 percent are occupied. Approximately 90 percent of occupied units are owner occupied, revealing a relatively lower number of owners in these block groups compared to the other neighborhoods in the study area. The housing stock in these areas is much newer than in Austin as a whole or in Travis County overall: 52 percent of homes in these block groups were built since 2000, compared to only 21 percent citywide and 25 percent countywide. Ninety-eight percent of these homes are single family detached units (US Census, 2008-2012).

Shady Hollow

The Shady Hollow CDP, located in southern Travis County, spans roughly 4.6 square miles from the county line approximately one mile southwest of the MoPac-SH 45 interchange to Bauerle Ranch Park in the east. The CDP contains the Shady Hollow subdivision, Bailey Middle School, David C. Ellis Community Center, and several neighborhood parks. Most of this development is sited on the eastern half of the neighborhood; the western half is comprised of WQPLs. Approximately 2.9 square miles of Shady Hollow lies within the boundaries of the study area. COA is currently negotiating with the Shady Hollow MUD to annex those areas of the CDP located outside city limits. The current agreement brings the community fully within the City's jurisdiction in 2020 (see **Local Plans and Policies** in **Section 3.1.1**).

The US Census provides information specific to the boundaries of the Shady Hollow CDP. The CDP's population in 2010 was 5,004 people. Seventy-eight percent of the population is White, Non-Hispanic. Only two percent of the population five years and older is considered LEP. Twenty-seven percent of the population is less than 20 years old and 12 percent of the population is over 64 years old. The median household income for the CDP was $121,758 in 2012 (US Census, 2010; 2008-2012).

There are 1,840 housing units in the CDP; 98 percent are occupied. Over 98 percent of the inhabited units are owner occupied. Ninety-seven percent of the community's homes have been constructed since 1980. Ninety-eight percent of units are single family detached; the remaining two percent are mobile homes (US Census, 2008-2012).

Manchaca

Manchaca CDP covers three square miles in Travis County along the west and south sides of FM 1626 from the county line extending north to Lowden Lane. Approximately 115 acres (or 0.17 square mile) of Manchaca lie within the study area. Land use throughout Manchaca is more diverse than in Shady Hollow, though residential uses still comprise a large portion of the land area. Within the study area, land uses consist of undeveloped land, an industrial site, and the Manchaca Optimist Youth Sports Complex. Townsley Historical Cemetery is also located within the CDP.

The US Census provides information specific to the boundaries of the Manchaca CDP. The CDP contained 1,133 people in 2010. Sixty-three percent are White, Non-Hispanic. Hispanic or Latino residents comprise the largest minority group in the CDP at 32 percent of the population. Twenty-four percent of the population is under 20 years old and 14 percent is over 64, making this community's population one of the oldest in the study area. No residents are considered LEP. Median household income in the CDP was $73,750 in 2012 (US Census, 2010; 2008-2012).

Manchaca contains 472 housing units, 94 percent of which are occupied. Of those occupied units, 82 percent are owner occupied. Most units are single family detached homes (73 percent), with duplexes (six percent) and mobile homes (23 percent) accounting for the rest of the housing stock. Sixty-five percent of the homes in Manchaca were built in the 1970s and 1980s, making the average home in this area older than the average home in Austin or in Travis County overall (US Census, 2008-2012).

Hays County

In the center of the study area, the subdivisions of Autumn Wood, Arrowhead Acres, and Southwest Territory form a cluster of residential development off Bliss Spillar Road, straddling the county line. Built along Little Bear Creek, these developments contain single family detached homes on large lots.

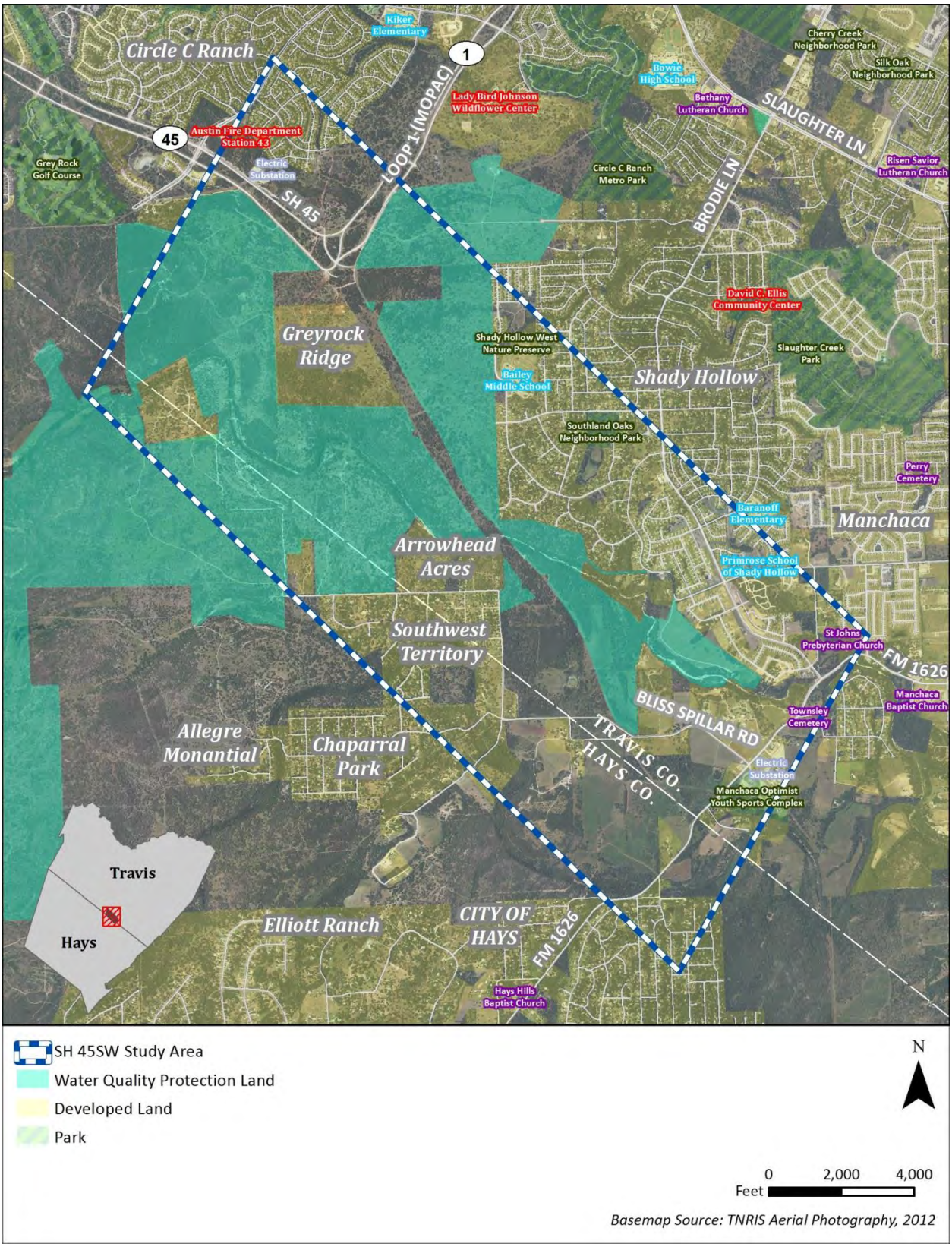
These neighborhoods are located in tract 109.01, block groups 1 and 3. These are large block groups, extending south to RM 967 and encompassing the city of Hays and the ETJs of Buda and Dripping Springs. The population of these block groups in 2010 was 4,452 people. Eighty percent of the population is White, Non-Hispanic. Here as well, Hispanic or Latino residents form the largest minority group. One percent of the population is considered LEP. The age structure of these block groups' populations is similar to Austin's and Travis and Hays counties' with 27 percent of the population under 20 years old and 10 percent over 64 years old. The median household income for these block groups ranged from $83,359 to $117,466 in 2012 (US Census, 2010; 2008-2012).

There are 1,616 housing units in these block groups, 98 percent of which are occupied. Of those occupied units, 92 percent are owner occupied. The housing stock in this area is older than in South Austin: 30 percent of the homes in this block group were constructed during the 1980s and 23 percent during the 1990s (US Census, 2008-2012).

Community/Public Resources

This section discusses community facilities and public resources that are located in the proposed project study area, including utility service providers, schools, places of worship, libraries, and government offices. These facilities and resources are shown on **Figure 3.2-4.**

Figure 3.2-4: Points of Interest in Study Area



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Utilities

Utility lines in the study area include water and wastewater, fiber optics, natural gas, telephone, cable, and electrical lines (including an LCRA transmission line along roughly four miles of existing state-owned ROW). There is an electric substation located on the north side of SH 45, approximately 0.3 mile east of Escarpment Boulevard and another on the east side of FM 1626, approximately 0.1 mile north of Bliss Spillar Road.

Utilities that provide water services to study area neighborhoods and businesses include Austin Water Utility, City of Hays, City of Buda, Aqua Texas, Inc., Mid-Tex Utilities, Inc., and several small water service companies (WSCs) and water control and improvement districts (WCIDs). Wastewater services are provided by COA and Mid-Tex Utilities. One MUD operates in the study area in the Shady Hollow community. Solid waste disposal is overseen by COA.

Internet, cable, and telephone service is provided in the Austin area by Time Warner Cable, Grande Communications, and AT&T. Natural gas is supplied by Texas Gas Service.

Schools, Parks, Places of Worship, and Public Facilities

There is one school and one preschool located in the study area (**Table 3.2-7**); no day cares are located within the study area. Austin Independent School District (AISD) and Hays Consolidated Independent School District (CISD) serve the students within the study area.

Table 3.2-7: Schools within SH 45SW Study Area

Name	Location	School Type
Bailey Middle School	4020 Lost Oasis Hollow, Austin, TX	Public; Middle
Primrose School of Shady Hollow	12341 Brodie Ln, Austin, TX	Private; Preschool

Source: CP&Y, 2014

There is one public park in the study area: Southland Oaks Neighborhood Park, a 19-acre park operated by COA. A few privately owned parks and recreational facilities are also located in study area subdivisions, including Shady Hollow West Nature Preserve and the Manchaca Optimist Youth Sports Complex.

There is also one church and a small, historic cemetery in the study area (**Table 3.2-8**).

Table 3.2-8: Places of Worship and Cemeteries within SH 45SW Study Area

Name	Location
St. John's Presbyterian Church	12420 Hewitt Lane, Austin, TX
Townsley Cemetery	Corner of Johnson Ln and FM 1626, Manchaca, TX

Source: CP&Y, 2014.

Other Public/Community Facilities

No hospitals, libraries, or government offices are located within the study area. The Austin Fire Department's Station 43 is located at the edge of the study area's western boundary at Escarpment Boulevard and SH 45.

COA WQPLs cover much of the study area. These undeveloped lands, accounting for roughly 34 percent of the study area (1,820.98 acres), are protected from development in perpetuity, to maintain the health and productivity of the underlying Edwards Aquifer. Although public access is not permitted on these protected lands, they are managed by the City (either owned in fee simple or held in conservation easements) for the public purpose of maintaining groundwater quality and quantity.

Transportation System

The private automobile is the predominant mode of transportation in the study area, although there are limited bicycle/pedestrian options throughout the area.

The study area contains several major arterials including FM 1626, SH 45, and MoPac. Capital Metro does not currently operate any bus routes in the study area (Capital Metro, 2013). Outside the urbanized area of Austin, Capital Area Rural Transportation System (CARTS) provides local community transit service upon request Monday through Friday, with accommodations for disabled riders available. AISD buses operate routes along Manchaca Road and FM 1626 in Travis County (CAMPO, 2010). Hays CISD also operates bus routes along FM 1626 and Old Bliss Spillar Road within the study area.

According to the CAMPO *2035 RTP*, bicycle access throughout the six-county region is "primarily provided by interconnected, low-volume streets, and shoulders or bicycle lanes on higher volume streets," except for those streets that expressly forbid access (p. 38). Bike lanes exist on the local collector Escarpment Boulevard; wide curbs and shared lanes are found on other local streets and farm-to-market roads in the study area (COA, 2009). Additionally, the more heavily trafficked roads, MoPac and SH 45, have wide shoulders.

Although there are currently no dedicated bike lanes serving the major arterials in the study area, several bike facilities are proposed in the CAMPO *2035 RTP*. According to the plan, bicycle facilities along FM 1626, Brodie Lane, and Frate Barker Road are considered medium priority corridors, as is the proposed Violet Crown Trail. Bicycle facilities recommended by CAMPO for urban section roadways like those listed above include five- to six-foot dedicated bike lanes depending on the posted speed limit for roadways with average annual daily traffic (AADT) volumes below 10,000 vehicles. For roadways with over 10,000 AADT, bike lanes or shared-use paths are recommended (CAMPO, 2010).

The *Austin Bicycle Plan Update* (2009) recommends installing bike lanes on the following arterials in the study area: Brodie Lane, FM 1626, and Frate Barker Road, as well as other smaller streets throughout the portion of the study area within Austin's jurisdiction. While there is no dedicated bike infrastructure on FM 1626, the roadway is currently being constructed to include four- to 10-foot shoulders from RM 967 to Brodie Lane.

Pedestrian facilities are limited in the study area. Sidewalks are intermittent on Brodie Lane and are not currently found along FM 1626 or Frate Barker Road, although six-foot sidewalks and five-foot bike lanes are proposed along Frate Barker Road from Brodie Lane to Manchaca Road, and an eight-foot sidewalk is proposed along the west side of FM 1626 from RM 967 to Jerry's Lane. Sidewalks do exist on neighborhood streets along Brodie Lane from Sunland Drive to Frate Barker Road and in the Circle C neighborhood.

Travel Patterns and Accessibility

Existing travel patterns to primary destinations

Major roadways within the study area include SH 45, MoPac, FM 1626, and Brodie Lane. These roadways collect traffic from local streets and provide access to a number of primary destinations in both Hays and Travis counties, including Buda, South Austin, and downtown Austin.

TxDOT conducted a video license plate capture survey on roadways in the area in October 2013 (Atkins, 2013). Photographs of license plates were captured at 16 separate sites (shown as blue points in **Figure 3.2-5**) over a two-day period of 13 hours each day (6:00 am to 7:00 pm). Findings from the survey indicate that the most common destination for trips through the study area is MoPac. Of the 24,879 trips captured over the two-day video license plate survey, 7,260 (29 percent) were destined for points along MoPac between Slaughter Lane and US 290 (destination points 9 and 11) (Atkins, 2013). This major north-south corridor provides access to employment centers, retail areas, medical offices, and schools in downtown, central, and northwest Austin.

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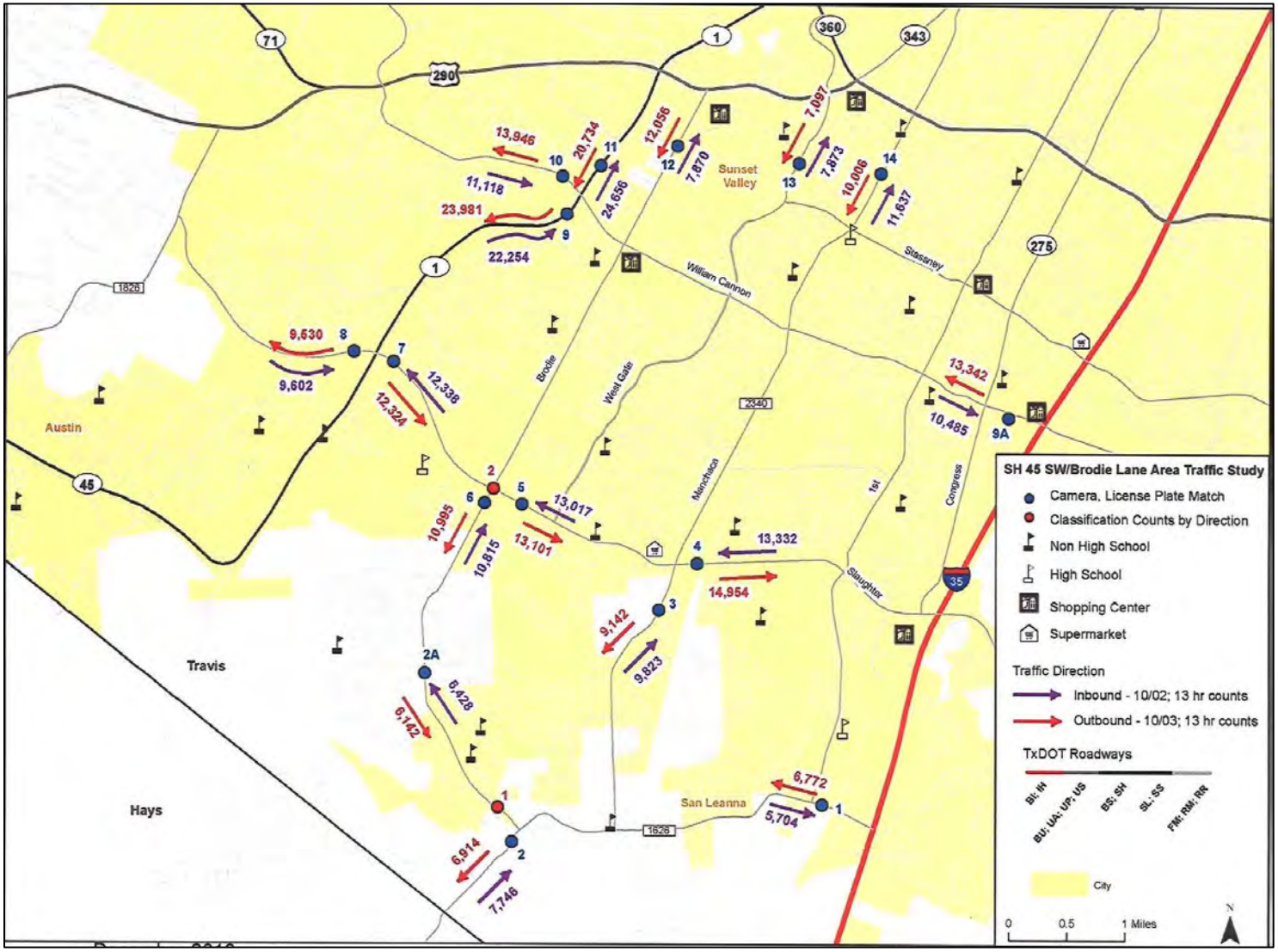
Figure 3.2-5: License Plate Capture Survey Study Area



Source: Atkins, 2013

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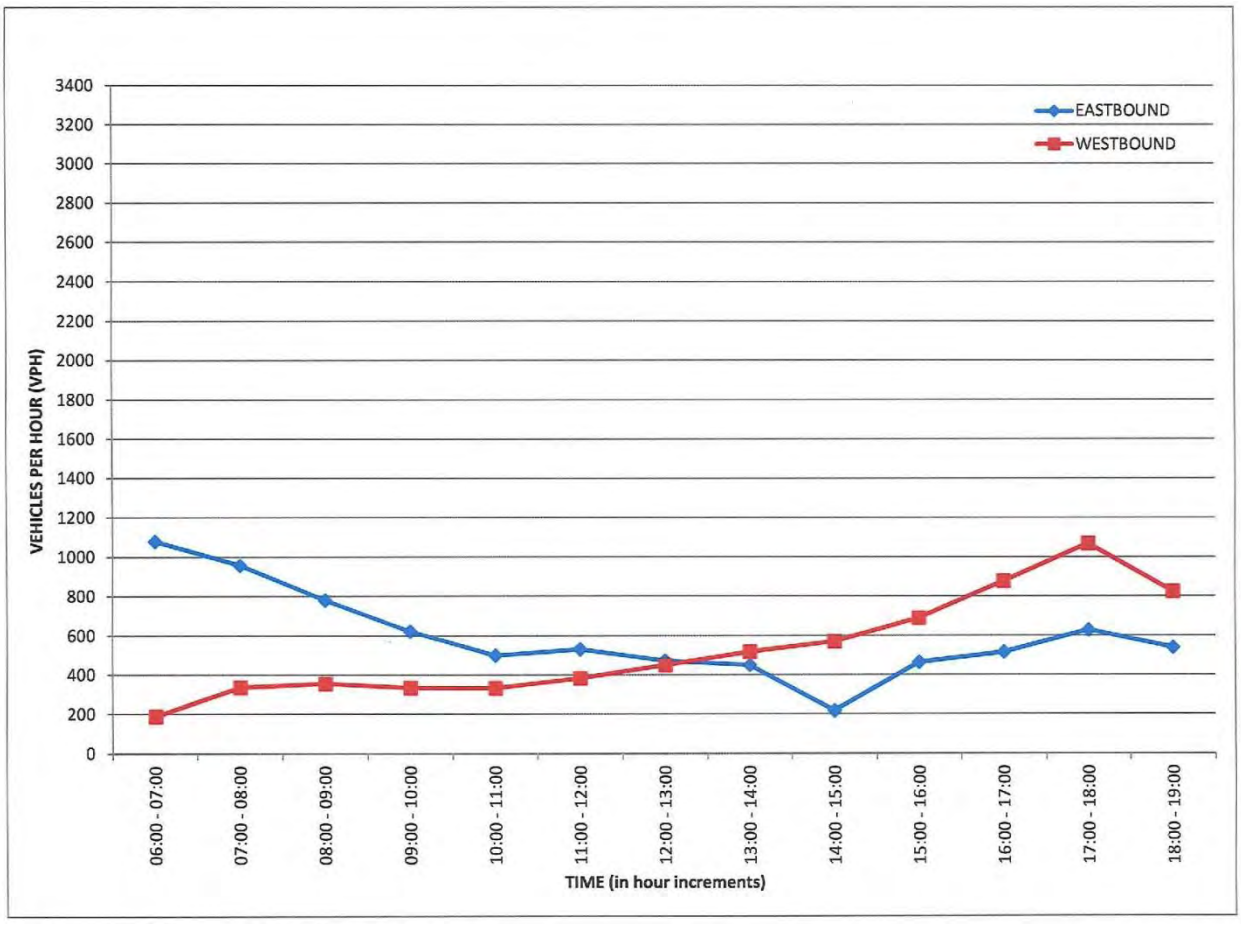
Existing traffic volumes

Traffic on area roadways exhibits a directional split, with most drivers traveling north into Austin during AM peak travel periods and south away from Austin during PM peak travel periods. The directional distribution of traffic on MoPac south of Slaughter Lane and SH 45 east of RM 1826 is 58 percent to 42 percent. The directional distribution of traffic on FM 1626 south of Brodie Lane is even more pronounced: 62 percent to 38 percent (HNTB, 2014; **Appendix N: Traffic Memorandum**).

This point is illustrated in **Figure 3.2-6**, which provides an example of the directional flow of traffic on roadways in the area, showing daily traffic counts on FM 1626 just south of Brodie Lane.

Figure 3.2-6: Vehicles per Hour on FM 1626 South of Brodie Lane (2013)



**Eastbound traffic travels toward Austin and IH 35; westbound traffic travels away from Austin and into Hays County.*
Source: Atkins, 2013

Traffic counts collected by the Mobility Authority in late 2013, combined with TxDOT daily counts from 2002 to 2012, were used to develop baseline 2013 daily traffic volumes for the

study area (HNTB, 2014; **Appendix N: Traffic Memorandum**). Current traffic volumes along the roadways intersecting the state-owned ROW are shown in **Table 3.2-9**.

Table 3.2-9: Daily Traffic Volumes on Roadways Crossing State-Owned ROW (2013)

Roadway	Daily Traffic Volume
MoPac	15,200
SH 45	7,600
Bliss Spillar Road	2,300
FM 1626	18,000

Source: HNTB, 2014

3.2.2 Direct Effects

Build Alternative

Residential and Commercial Displacements

Because the Build Alternative would utilize existing state-owned ROW, no relocations or displacements would occur as a result of the proposed project.

Impacts to Community Cohesion

The proposed project's alignment on existing state-owned ROW would not bisect any existing developments and is mostly surrounded by WQPLs. Approximately 6,257 feet of ROW are bordered by residential developments, but only Bliss Spillar Road would cross the proposed alignment. There, an interchange would allow for access to northbound SH 45SW from Bliss Spillar and to eastbound and westbound Bliss Spillar Road from southbound SH 45SW (see schematic in **Appendix C: Build Alternative Draft Schematic**). Thus, the Build Alternative would not bisect existing neighborhoods and is not anticipated to have impacts on community cohesion.

Impacts to Travel Patterns and Access

The Build Alternative is proposed as a limited access facility; therefore, it would directly impact access only at the three interchanges at MoPac, Bliss Spillar Road, and FM 1626, which would provide access to the proposed roadway. At these points, access to the area transportation network and nearby destinations would be anticipated to improve as the proposed roadway is expected to improve system connectivity, local mobility, and travel times and to provide an alternative route to congested local roadways.

Based on calculations (RTG, 2014) of projected traffic into 2035 on area roadways (with and without the proposed project), travel times on area roadways in 2035 both with and without

the proposed project show that during both the AM and PM peak travel periods, travel times would be shorter on all routes measured with the proposed roadway than without it. Existing routes between FM 1626 and MoPac that were modeled include: FM 1626 to Manchaca Road to Slaughter Lane to MoPac and FM 1626 to Brodie Lane to Slaughter Lane to MoPac. According to the calculations, travel times on these routes are projected to be 23 to 28 percent longer in 2035 under the No Build Alternative (without the proposed roadway) than in 2035 under the Build Alternative (with the proposed roadway). Under the Build Alternative, the roadway itself would allow drivers to travel between FM 1626 and MoPac in only 12 minutes during AM peak travel times and 10 minutes during PM peak travel times – saving between 17 and 20 minutes in the morning and 18 and 20 minutes in the afternoon over other routes along Manchaca Road, Brodie Lane, and Slaughter Lane. Travel time differences are discussed further in the **Travel Time Differences** subsection.

Impacts to Bike, Pedestrian, and Transit Access

Under the Build Alternative, a shared use path would be constructed that parallels the roadway, running the length of the proposed project and connecting to existing sidewalks on Escarpment Boulevard. This path would be open to pedestrians and bicyclists alike, enhancing non-motorized access in the study area. The proposed route of the Violet Crown Trail, a regional trail system co-sponsored by COA and HCC that would extend 30 miles from Barton Springs into Hays County, crosses the ROW of the proposed project, providing a potential opportunity for the shared use path associated with the proposed project to connect to the Violet Crown Trail. The path would also connect to FM 1626, where four-foot to 10-foot-wide shoulders are currently under construction between RM 967 and Brodie Lane, augmenting bicycle and pedestrian infrastructure in southern Travis and northern Hays counties.

Although the proposed project study area does not currently contain any bus routes, the proposed project could be utilized by buses should Capital Metro service extend into the area. The rural transit service CARTS would also be able to travel on the proposed roadway. Mobility and travel time improvements would be expected to affect these transit vehicles just as they would affect other motorists.

Project-Level Toll Analysis

Toll Policies

The Mobility Authority would be the governing authority for the proposed toll project; Mobility Authority tolling policies would apply. Governing policies for the Mobility Authority are available online at www.mobilityauthority.com and are included in **Appendix F: CAMPO Regional Toll Analysis & Mobility Authority Toll Policy**.

Under Section 4 of the Mobility Authority's tolling policy, military and emergency response vehicles would be exempt from paying the toll when using the roadway. Transit

vehicles owned or operated by Capital Metro and/or CARTS with a capacity of 16 or more persons would also be exempt from the toll.

Section 5 of the policy details the discounts and incentives customers are offered. Customers who pay their tolls using a toll tag would receive a discount equal to 10 percent of the toll amount paid by cash toll customers. At times, the Mobility Authority may conduct promotions or marketing activities that encourage drivers to use Mobility Authority toll roads and reward customers for such use. More information on toll rates and methods of collection is provided below.

Section 11 of the policy outlines customer service and violation policies. The TxDOT Customer Service Center provides customer service to Mobility Authority customers and supports all operations related to customer toll tag account setup, account maintenance, and customer service. Please refer to **Appendix F: CAMPO Regional Toll Analysis & Mobility Authority Toll Policy** for more information on the Mobility Authority's policies regarding toll violations, such as a) customers that use tolled lanes without corresponding toll tags, b) violation enforcement strategies, c) procedures for disputing toll violations, and d) appealing a toll violation.

Anticipated Toll Rates and Methods of Collection

An Electronic Toll Collection (ETC) system would be implemented along the proposed roadway. The roadway would not offer "on-site" or automated cash payment options through toll booths, plazas, stations, or gates.

Travelers would pay the toll using electronic toll tags or pay-by-mail billing. Pay-by-mail billing would apply to travelers who do not have electronic toll tags. With pay-by-mail billing, a bill would be mailed to the address associated with the driver's vehicle registration information. Travelers using this option would be assessed a higher toll rate and an additional service charge. Toll tags could be purchased using cash, check, or credit card.

Locations of Toll Gantries

Locations of toll gantries would be finalized prior to construction.

Non-Toll Facilities

Alternative travel options would be available to those who choose not to use the proposed toll facility. The existing roadway system in the area is comprised of non-tolled arterials and expressways, including FM 1626, Brodie Lane, Manchaca Road, Slaughter Lane, and MoPac. These roadways are shown in **Figure 1.4-2**.

Travel Time Differences

Travel time differences were calculated using the CAMPO 2035 travel demand model, updated to reflect current demographic and traffic conditions in the southern Travis/northern Hays County area. These calculations show that during both AM and PM peak travel periods in 2035, travel times are shorter with the proposed roadway than without it. Further, without the proposed roadway, travel times at peak periods between MoPac and FM 1626 along existing, non-tolled routes (Slaughter Lane to either Brodie Lane or Manchaca Road) would almost double over observed 2014 travel times. According to the calculations, the proposed project would be expected to improve travel times even on these non-tolled routes: travel times along non-tolled roadways are projected to be 23 to 28 percent longer without the proposed project than with the proposed project. **Table 3.2-10** provides these calculations. Existing roadways are shown in **Figure 1.4-2**.

Table 3.2-10: Travel Time Differences With and Without SH 45SW

Peak Hour	Route	Begin	End	No Build*: 2035 Projected Total Travel Time (min)	Build: 2035 Projected Total Travel Time (min)	2014 Observed Travel Times (min) (1)
AM	SH 45SW – MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	N/A	12	N/A
AM	FM 1626-Brodie-Slaughter-MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	38	29	20
AM	FM 1626-Manchaca-Slaughter-MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	44(2)	32(2)	22(2)
PM	MoPac-SH 45SW	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	N/A	10	N/A
PM	MoPac-Slaughter-Brodie-FM 1626	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	37	28	19
PM	MoPac-Slaughter-Manchaca-FM 1626	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	41	30	29

** No Build scenario assumes all other projects listed in CAMPO 2035 RTP are constructed.*
(1): A minute of travel time was added to account for the decrease in speed associated with MoPac on and off ramps.
(2): Travel times adjacent to Menchaca Elementary were increased 25% to account for the reduced speed in the school zone.
Source: RTG, 2014

EJ-Related Demographic Data (by TAZ)

This project-level toll analysis includes identifying EJ areas to help ensure that the planning process addresses effects to EJ populations. CAMPO data was obtained for the TAZs in the five-county CAMPO area.[3] According to the *Regional Toll Network Analysis* (**Appendix F: CAMPO Regional Toll Analysis & Mobility Authority Toll Policy**), there are 1,413 TAZs in the CAMPO area, 443 of which are EJ TAZs. TAZs must meet one or more of the following thresholds to be classified as an EJ TAZ:

- "Low-income" TAZs have at least 50 percent of the population living in families earning less than 80 percent of the county median family income or have at least 25 percent of the population with income falling below the federal poverty level for a family of three ($17,098).
- "Minority" TAZs have less than 50 percent of the population identifying themselves as "White, Non-Hispanic."

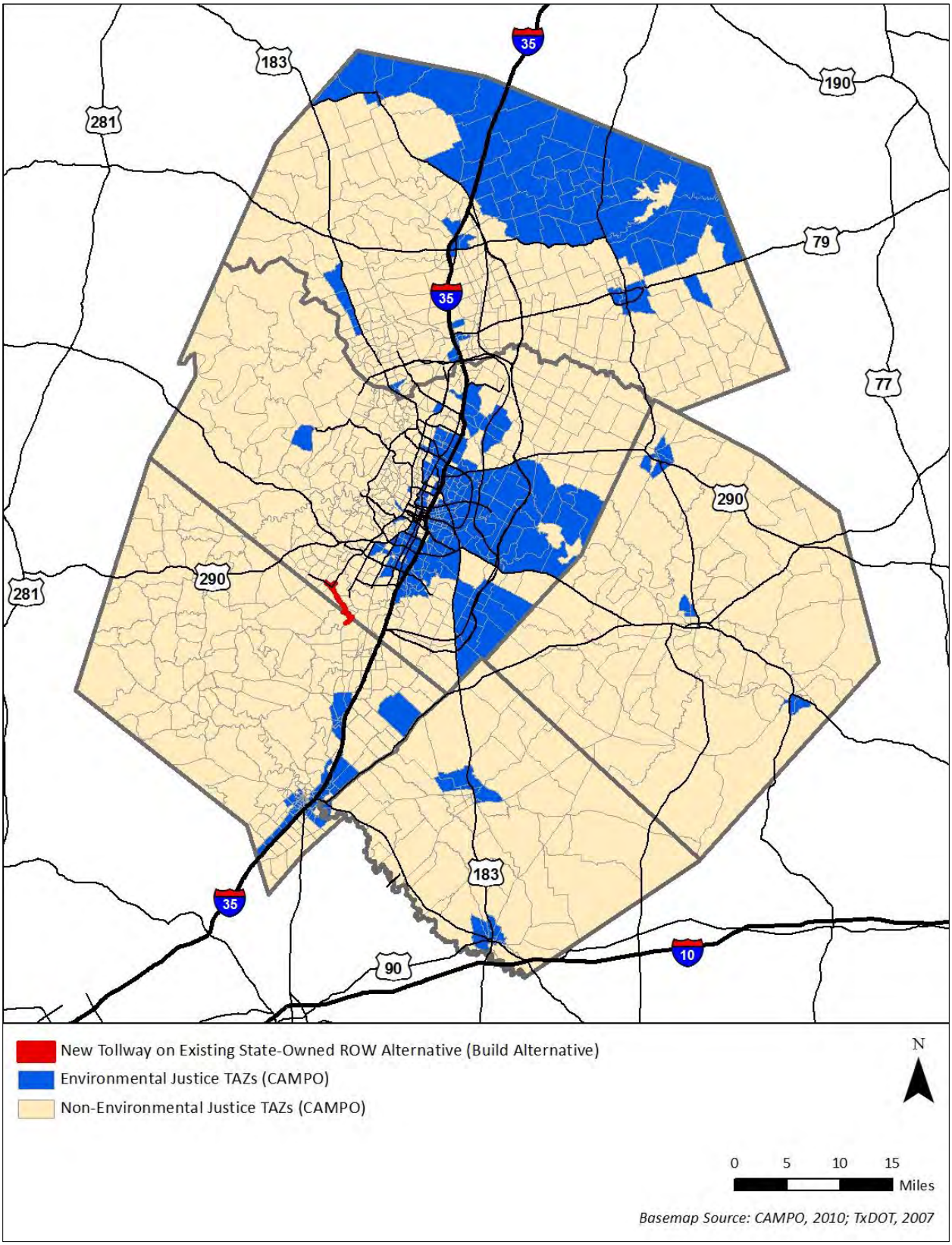
CAMPO used the following data to identify EJ TAZs:

- 2005 median family income levels provided by the Capital Area Council of Governments (CAPCOG), based on the 2005 Bureau of Economic Analysis Data to calculate low-income thresholds;
- 2008 and 2009 poverty data from the Census Bureau; and
- 2005 ethnicity data, based on 2000 census data ethnicity ratios applied to 2005 population data.

As seen in **Figure 3.2-7**, there are no EJ TAZs located near the proposed project. The nearest EJ TAZs are located over four miles from the state-owned ROW.

[3] The CAMPO planning region now includes a sixth county, Burnet, but because Burnet County has not yet been incorporated into CAMPO's travel demand model, the *2013 Regional Toll Analysis* does not include Burnet County.

Figure 3.2-7: CAMPO Environmental Justice Traffic Analysis Zones



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Potential Economic Impact to Individuals

Currently, typical toll rates range from $0.20 to $0.30 per mile. Pending a full financial analysis to set toll rates, the economic impact on drivers of the proposed project can be illustrated by the following scenario. Using the upper limit of the toll rates mentioned above, it is assumed that the toll rate would be set at $0.30 per mile and that the average driver would make 250 round-trips per year (based on 50 five-day work weeks per year). The length of the Build Alternative is approximately four miles. Under this scenario, the annual cost to the commuter to use the proposed roadway would total $600. **Table 3.2-11** shows the percentage of a commuter's income spent on tolls in this scenario.

Table 3.2-11: Estimated Annual Toll Cost as Percentage of Commuter's Annual Income

Annual Household Income*	Percentage of Annual Income
Hays County 2012 Median Household Income ($57,834)	1.0%
Travis County 2012 Median Household Income ($56,403)	1.1%
2014 DHHS Poverty Guideline ($23,850)	2.5%

Source: US Census, 2008-2012

Commuters might choose to reduce their toll-related economic impact by carpooling, dividing tolls among more than one traveler. If Capital Metro or CARTS extend transit service to this roadway, travelers in these vehicles would not be charged a toll.

Calculations of travel time differences (**Table 3.2-10**) indicate that drivers who utilize the proposed roadway instead of existing local roadways would save approximately 146 hours of travel time per year in 2035. The US Department of Transportation has estimated the monetary value of such travel time savings for personal travel to be $12/hour (USDOT, 2011). In this case, a driver using the proposed roadway instead of existing roadways could save time valued at up to $1,752 annually, far exceeding the $600 spent on tolls to access the roadway.

LEP and Disabled Accommodations

There are accommodations in place to allow persons with LEP and the disabled to access the toll facilities. For example, the TxTag® website is available in Spanish and provides a customer service contact number for the deaf and hard of hearing.

Potential Users of the Toll Facility

Data obtained from the video license plate survey conducted by TxDOT in October 2013 can be useful in identifying potential users of the proposed roadway. On FM 1626 just south of Brodie Lane (site #2 in **Figure 3.2-5**), a total of 14,660 plates were identified. Of these plates, approximately 2,700 vehicles were recorded at more than one video capture location, representing "through trips" from one location in the study area to another (Atkins, 2013).

Based on the results of this survey, approximately 61 percent of the total through trips from/to FM 1626 at site #2 (FM 1626 south of Brodie Lane) utilized Brodie Lane to conduct their travel. Drivers making trips along FM 1626 and Brodie Lane to sites #7, #9, and #11 (Slaughter Lane west of MoPac, MoPac south of William Cannon Drive, and MoPac north of William Cannon Drive) are considered likely candidates to use the proposed toll road based on their routes and destinations. These trips constitute approximately 24 percent of the FM 1626-originated through trips utilizing Brodie Lane and roughly seven to 12 percent of the current traffic volume on Brodie Lane (Atkins, 2013).

Travel time differences can also indicate trips that may become potential users of a toll facility. Calculations using the CAMPO 2035 model (discussed in the **Travel Time Differences** subsection) show that trips between FM 1626 and MoPac using existing routes (i.e. Slaughter Lane, Manchaca Road, and Brodie Lane) would be longer during 2035 peak periods than trips along the proposed roadway, indicating that drivers who wish to travel between FM 1626 and MoPac north of Slaughter Lane may use the new facility to take advantage of these shorter travel times.

CAMPO Traffic Model Assumptions and Limitations

The CAMPO Travel Demand Model is a regional, five-county model consisting of Bastrop, Caldwell, Hays, Travis and Williamson counties. It is a travel demand model that forecasts daily traffic for a 24-hour period. The travel demand model's base year is 2005, which reflects the latest scenario available in which there were no toll roads in operation. Toll and commuter rail services were not then part of the regional transportation system, so the current version of the model is not calibrated to these choices. During model development, the toll system began to come on-line at the end of 2006. In late 2007 and early 2008, data were obtained for the opened segments of the toll road system and the model was adjusted to match the 2008 network as closely as possible. For this toll analysis update, the model network was updated to reflect the most current information available on existing and planned roadway facilities. The updated CAMPO model also conducts analyses for both the mid-day and peak AM travel periods in five-minute intervals.

Although updates were made to the model to incorporate the most current information on existing and planned toll facilities and non-tolled roadways, ensuring consistency with the

2035 RTP, the model as yet does not include Burnet County, which came under the MPO's jurisdiction in 2013.

CAMPO uses a demographic allocation tool to distribute population and employment through the TAZs in the five-county region. Base year (2005) population was allocated using data from the E-911 phone database and ESRI datasets. Baseline employment information was obtained from the Texas Workforce Commission. The demographic allocation tool is then used to forecast population and employment growth over the region. The tool allocates additional population and jobs away from areas that are unattractive (i.e. areas under development restraints, such as floodplains, parks, cemeteries, and ROW) and toward areas that are more attractive for development. This allocation tool also takes into account county forecast totals and development restraints.

When using a regional model, it is important to keep in mind the reason for which it was developed: to provide a regional sense of travel demand and movement. Use of the model for more detailed corridor analysis should be followed up with additional data collection and analysis, including traffic counts, mode share data, vehicle composition, origin-destination patterns, and stated preference surveys, to make the model more representative of the corridor being studied. Much of this information has been gathered and analyzed for the proposed project, including demographic data (see **Section 3.2.1**), travel time and traffic projection calculations (see **Travel Time Differences** subsection), and a license plate survey (see **Existing Travel Patterns to Primary Destinations** section).

Impacts to Environmental Justice Populations

The Build Alternative would not alter existing access to or within any neighborhoods in the study area. This includes the only EJ populations identified in the study area, the eight census blocks containing minority populations greater than 50 percent. The proposed project would provide benefits to communities in the proposed project study area, including increased mobility, improved travel times, and improved system connectivity. EJ travelers and non-EJ travelers alike would experience the benefits associated with this improved connectivity and mobility in the area transportation network.

Tolling Impacts on EJ Populations

Any motorist utilizing the proposed roadway would experience an economic impact. For all motorists who use the roadway, the same toll would be assessed regardless of income. Thus, the relative impact would be proportionately higher for low-income populations because the cost of paying tolls would represent a higher percentage of household income than for higher income populations. However, it is important to note that within the proposed project study area, the best available data suggests there are no low-income populations (defined as 50 percent of the population at or below DHHS poverty guidelines). EJ populations in the area are classified as such based only on their minority status.

The *2008 Toll Road Opinion Survey* prepared by the Texas Transportation Institute (TTI) suggests that EJ persons use toll roads to the same extent as all other regional travelers. The survey found that the frequency of toll road usage is fairly similar between EJ persons and all other survey respondents. Notable differences emerge in trip purpose, as it was determined that EJ respondents are more likely to use toll roads for non-discretionary trips (to work or school or for work purposes). However, examining the situations that are conducive for using toll roads, EJ and non-EJ respondents are similar, with the dominant (approximately half the respondents) reasons for using the toll roads listed as congestion avoidance and convenience for trip-making. These reasons indicate that using toll roads is based more on choice, rather than necessity (TTI, 2008).

EJ populations identified in the eight blocks within the proposed project study area would not experience disproportionate and adverse effects as a result of this proposed project. All motorists and transit users who use the proposed roadway would benefit from reduced congestion and shorter travel times. As stated above, EJ motorists are just as likely to use toll roads as non-EJ motorists (TTI, 2008).

Impacts to Community and Public Resources

The Build Alternative would not require the relocation of any community or public facilities. Existing access to these facilities would be maintained and the proposed roadway would provide additional access by providing an alternative route to existing roadways.

Utility lines in the study area, including the LCRA transmission line, a separate utility easement which parallels the state-owned ROW, would not be directly affected by the proposed project.

No Build Alternative

Under the No Build Alternative, no residential or commercial displacements would occur. Under this alternative, there would be no impacts associated with tolling. It is assumed that other planned projects in the study area would be implemented, including projects in the CAMPO *2035 RTP*. According to travel time calculations, under the No Build Alternative, travel times on existing area roadways is expected to increase by an average of nearly 80 percent (**Section 1.4**). Although the planned projects could result in changes to travel patterns and accessibility, the extent of these impacts cannot be determined at this time. No impacts to EJ populations would occur under the No Build Alternative. Additionally, no project-related impacts to community or public resources or community cohesion would occur.

3.2.3 Encroachment-Alteration Effects

Neighborhoods/Travel Patterns and Access

The Build Alternative would maintain existing access to and within neighborhoods within the proposed project's AOI (described in **Section 3.0**). Some neighborhoods, especially those along currently heavily trafficked arterials like Brodie Lane, might experience effects due to changes in traffic circulation as drivers who once used these roadways to access MoPac or FM 1626 instead use the proposed SH 45SW.

The *Traffic Forecasting Methodology Memorandum* (HNTB, 2014; **Appendix N: Traffic Memorandum**), completed for TxDOT, documents the results of traffic demand modeling of the 2035 traffic forecasts both with and without the proposed project to better understand the traffic impacts that constructing SH 45SW may have on the surrounding roadway network. According to the modeling, 2035 traffic volumes on Slaughter Lane (east of MoPac), Brodie Lane (south of Slaughter Lane), Manchaca Road (south of Slaughter Lane), and FM 1626 (north of proposed SH 45SW) would all decrease with the construction of the proposed project compared to the No Build Alternative. MoPac (north of SH 45 to Lady Bird Lake) would experience an increase in traffic volumes in 2035 with the proposed project over the No Build Alternative. These modeled traffic volumes are shown in **Table 3.2-12**.

Table 3.2-12: Traffic Volumes on Surrounding Roadways in 2035, Build and No Build Alternatives

Roadway Location*	2013 Traffic Counts	2035 Traffic Volume		Difference between Build and No Build in 2035	
		Build	No Build	Volume	Percentage
Slaughter Ln (just east of MoPac)	38,329	31,000	43,000	-12,000	-27.91%
Brodie Ln (just south of Slaughter)	24,993	21,600	29,600	-8,000	-27.03%
Manchaca Rd (just south of Slaughter)	28,000	36,000	51,000	-15,000	-29.41%
FM 1626 (0.1 mile south of Brodie)	18,007	24,800	35,000	-10,200	-29.14%
MoPac (0.1 mile south of La Crosse)	14,866	44,000	26,600	+17,400	+65.41%
MoPac (between La Crosse & Slaughter)	23,385	47,000	33,234	+13,766	+41.42%
MoPac (just north of Slaughter)	46,191	78,000	62,000	+16,000	+25.81%
MoPac (just north of US 290/SH 71)	109,344	201,000	192,000	+9,000	+4.69%
MoPac (at Lady Bird Lake)	152,326	273,000	269,000	+4,000	+1.49%

**Traffic volumes listed in the table capture the amount of traffic at these specific locations.*

Note – Traffic modeling conducted by CAMPO found little difference in traffic volumes north of Lady Bird Lake on MoPac (from approximately 1st St to the 5th/6th St area) with and without the proposed project (COA, Sept 2014).
Source: HNTB, 2014

As shown in **Table 3.2-12**, increases in traffic volumes are projected to be higher at points closer to the proposed project. These traffic volumes were modeled using CAMPO's 2035 TransCAD model, adjusted to reflect more current demographic and roadway conditions. Therefore, the MoPac South project included in the CAMPO 2035 RTP, involving construction of one additional, managed lane in each direction from Cesar Chavez to Slaughter Lane, is also reflected in the traffic model's assumptions. In accordance to the Highway Capacity Manual for Basic Freeway Segments (National Research Council Transportation Research, 2010), the basic capacity of this portion of MoPac with the addition of these managed lanes would range from 60,000 to 102,000 vehicles per day. This range will adequately accommodate the 78,000 vehicles projected to be using the roadway under the Build Alternative in 2035.

By providing an alternative route to congested local roadways and improving system connectivity, the proposed roadway would also provide benefits to emergency responders in the area. The proposed SH 45SW would enable emergency vehicles traveling from the Buda area into Austin to bypass congested local roadways (IH 35, Manchaca Road, Brodie Lane, and South First), which emergency responders currently use to access hospitals in Austin (including Brackenridge and Seton Medical Center).

Changes to community cohesion, neighborhood stability, existing access to specific services, or recreation patterns at public facilities are not expected to occur due to the limited access nature of the proposed roadway.

Environmental Justice

The proposed project would not alter existing access to or within any neighborhoods in the AOI, including those with EJ populations. By providing an alternative route to congested local roadways, the proposed project would benefit both low-income drivers and their non-low-income counterparts, should they choose to utilize the roadway. Providing this alternative route would also benefit those drivers who continue to use the existing, non-tolled facilities through increased mobility on both the proposed roadway and on the existing roadway network. Improved reliability and travel times would benefit all drivers, including low-income or minority commuters. Further, as previously stated, the EJ populations located in the study area are characterized as such by their minority status, not their income level. Tolling impacts on EJ populations correlate more closely with income than with minority status. For these reasons, disproportionate and adverse impacts to EJ populations are not anticipated as a result of the Build Alternative.

3.3 Geology and Soils

The following sections address the physiographic setting, geology, and soils within the study area (described in **Section 3.1**).

3.3.1 Existing Conditions

Physiographic Setting

The study area is situated at the eastern edge of the Edwards Plateau, just west of the Blackland Prairies ecoregion (Griffith et al., 2004). The topography within the study area consists mainly of gently rolling uplands locally cut by headwater drainage courses and the main channels of larger creeks, including Bear Creek, Little Bear Creek, and Slaughter Creek (see **Appendix G: Study Area Photographs**). Elevations in the study area range from approximately 650 feet above mean sea level (amsl) in the southeast to approximately 850 feet amsl in the northwest. Total topographic relief is approximately 200 feet, and most slopes are in the two percent to five percent range. Steeper slopes (some greater than 15 percent) occur within isolated locales (USGS, 1986; USGS, 1988).

The study area receives approximately 32 inches of precipitation annually, with the greatest precipitation falling in late spring and early fall (1981-2010 average; National Weather Service, 2013).

Geology

Characteristics of Geologic Units in the Study Area

Geologic strata that outcrop in the study area are of Lower Cretaceous, Upper Cretaceous, and Quaternary age (Rose, 1972; Small, Hanson, and Hauwert, 1996). Most of the study area is underlain by various units of the Edwards Group, a thick sequence of limestone and dolomite of Lower Cretaceous age (Rose, 1972; Smith, Hunt, and Schindel, 2005). Geologic faults, or fractures in bedrock along which rocks on one side have moved relative to the other side, occur in the study area as a series of northeast to southwest trending faults with dominant displacements down to the southeast; therefore, strata within the study area are progressively younger from west to east (Garner and Young, 1976; Smith, Hunt, and Schindel, 2005). These are identified as normal faults based on the movement of rock when the fault occurred. At normal faults, the blocks of rock move apart at an angle, extending the Earth's crust, and the fault dips toward the downthrown block. From Bear Creek south, much of the Cretaceous-age substrate is covered by surface deposits of alluvium and thick, fertile soils formed on those deposits (Small, Hanson, and Hauwert, 1996; USDA, 1974). **Table 3.3-1** is a stratigraphic column depicting the various geologic units in the study area. **Figure 3.3-1** provides geologic units that outcrop in the SH 45SW study area as well as normal fault lines and

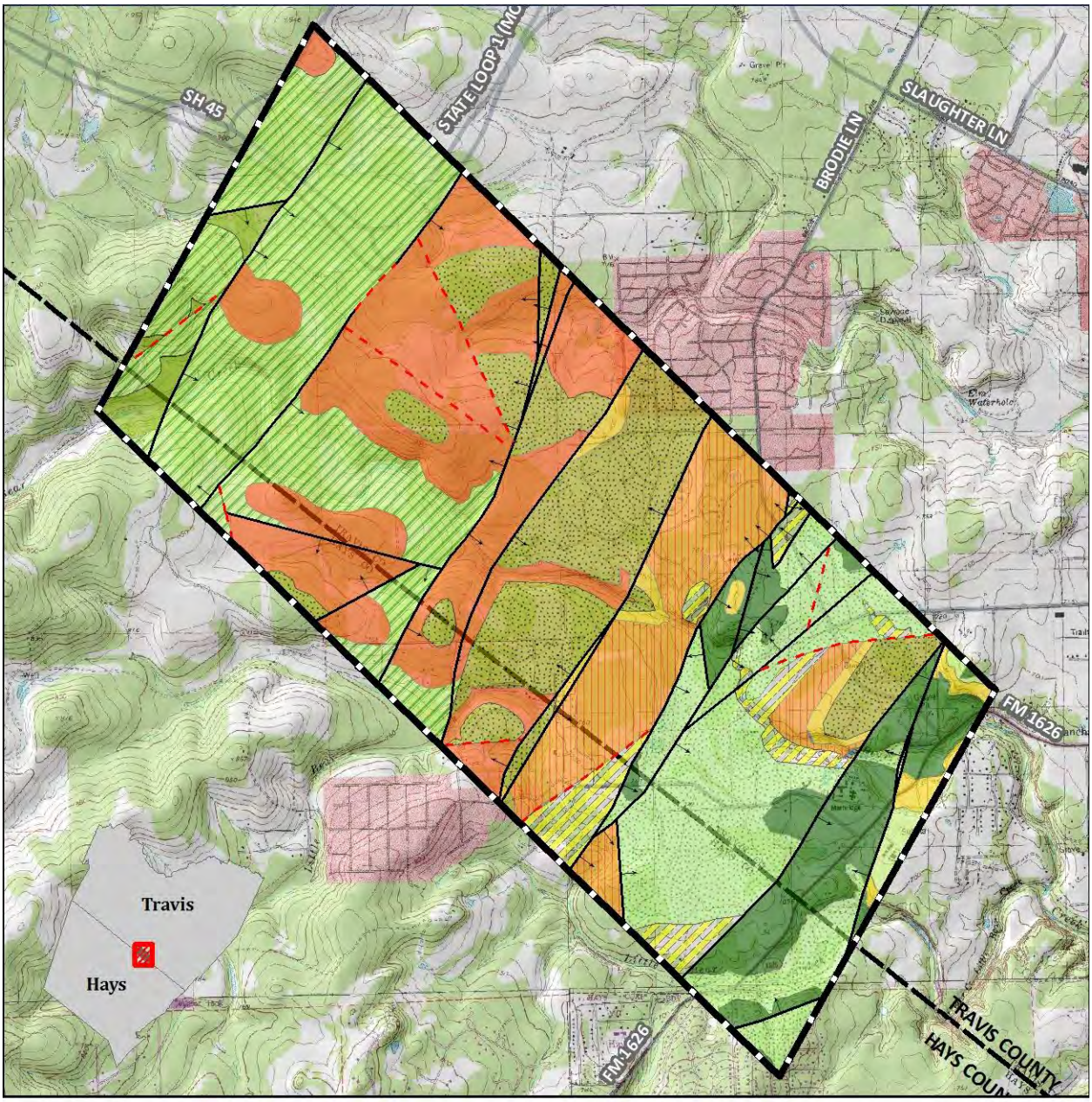
inferred normal fault lines. Inferred normal fault lines are extensions of existing fault lines or stand-alone fault lines that are not supported by field data but are inferred based on limited or weakly developed data and/or professional judgment.

Table 3.3-1: Typical Stratigraphic Column in SH 45SW Study Area

Upper Cretaceous	Upper Confining Units			Navarro and Taylor Groups, undivided; 600 feet thick	
				Austin Group (Kau); 130-150 feet thick	
				Eagle Ford Group (Kef); 30-50 feet thick	
				Buda Limestone (Kbu); 40-50 feet thick	
				Del Rio Clay (Kdr); 50-60 feet thick	
Lower Cretaceous	I	Edwards Aquifer		Georgetown Formation (Kgt)	40-60 feet thick
	II		Edwards Group	Person Formation; 50-180 feet thick	Cyclic and Marine member, undivided (cm)
	III				Leached and Collapsed member, undivided (lc)
	IV				Regional Dense member (rdm)
	V			Kainer Formation; 265-345 feet thick	Grainstone member (gs)
	VI				Kirschberg Evaporite member (ks)
	VII				Dolomitic member (do)
	VIII				Basal Nodular member (bn)
	Lower Confining Units			Upper member of Glen Rose Limestone (Kgr); 350-500 feet thick	

Source: Modified from Small, Hanson, and Hauwert, 1996; see Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays Counties, Texas (*SWCA and Cambrian Environmental, 2014b*)

Figure 3.3-1: Geology with Fault Lines in Study Area



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The Lower Cretaceous strata include, in ascending order, Glen Rose Limestone, the Edwards Group, and the Georgetown Formation. The Glen Rose Limestone, which underlies the entire study area, does not outcrop in the study area and therefore will not be described in any more detail in this section. The Edwards Group consists primarily of limestone with chert in the form of nodules, lenses, and thin discontinuous beds and includes the Kainer Formation (approximately 265 to 345 feet thick in the study area) and the Person Formation (approximately 50 to 180 feet thick in the study area) (Russell, 1996; Small, Hanson, and Hauwert, 1996; Smith, Veni, and Elliott, 2013; SWCA & Cambrian Environmental, 2014b). Within the study area, the Kainer and Person Formations of the Edwards Group have been divided into seven members; these include limestones, grainstones and mudstones (Rose, 1972; Small, Hanson, and Hauwert, 1996). The various members of the Edwards Group vary in porosity and permeability and, together with the Georgetown Formation, form the Edwards Aquifer. The Georgetown Formation is approximately 40 to 60 feet thick in the study area (Small, Hanson, and Hauwert, 1996; SWCA and Cambrian Environmental, 2014b).

The Upper Cretaceous strata include, in ascending order, the Del Rio Formation, the Buda Formation, the Eagle Ford Group, and the Austin Group. The Del Rio Formation overlies the Georgetown Formation and consists of gypsiferous clay. The Buda Formation is a dense, porcelaneous limestone and mudstone. The Del Rio and Buda Formations have a combined thickness of approximately 100 feet in the southeastern portion of the study area. The Eagle Ford Group consists of shale and argillaceous limestone and is approximately 30 feet thick in the study area (Small, Hanson, and Hauwert, 1996). The Austin Group consists of low-permeability white to gray chalky limestone with a thickness of approximately 100 feet within the study area (Small, Hanson, and Hauwert, 1996).

The Quaternary alluvial deposits include both alluvium and terraces composed mostly of sand and gravel with varying amounts of silt and clay (Small, Hanson, and Hauwert, 1996; USDA, 1974). The Quaternary alluvial and terrace deposits overlie the Upper Cretaceous erosional surface and are up to 20 feet thick in the southeastern portion of the study area (Hauwert, 2009; Small, Hanson, and Hauwert, 1996).

Karst Features

Karst features are created when there is a chemical reaction between groundwater and soluble rock, principally limestone and dolomite (Cowan and Hauwert, 2013; Smith, Veni, and Elliott, 2013; USGS, 2012). Sinkholes can develop and bedding planes and fractures widen and lengthen. The voids created by the dissolved rock make pathways for water to move through, allowing for movement and storage of groundwater. Karst landscapes are characterized by springs, caves, and sinkholes.

Many surficial karst features are present within the study area (Cowan and Hauwert, 2013; Russell, 1996; USGS, 1986; USGS, 1988). The largest caves and sinkholes occur in the

Kirschberg Evaporite and Dolomitic members of the Kainer Formation (Rose, 1972; Russell, 1996; Small, Hanson, and Hauwert, 1996). These surficial openings allow for rapid recharge to the underlying Edwards Aquifer. Conversely, karst features can provide conduits for rapid discharge of groundwater through spring openings (USGS, 2012). Fractures, sinkholes, and cave openings within stream corridors permit direct connections between surface water and groundwater (Slade, Dorsey, and Stewart, 1986; Smith, Hunt, and Johnson 2012; TCEQ, 2008).

Karst investigations were conducted within the state-owned ROW for TxDOT in 2007. Further investigations were conducted for TxDOT in 2014. These surveys were undertaken to identify all karst features within the state-owned ROW that exhibit surface expression, have the potential to lead to significant subsurface void space, and have the potential to recharge the main body of the Barton Springs segment of the Edwards Aquifer. Detailed field survey methods and findings are described in the *Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays Counties, Texas* (SWCA and Cambrian Environmental, 2014b). Field surveys included a pedestrian survey of the state-owned ROW, as well as review of previous surveys and other sources of information for features outside the state-owned ROW, field visits with COA staff to known features outside the state-owned ROW, and review of GIS data of known karst features provided by COA. Within the state-owned ROW, more than 220 potential karst features (primarily small depressions in the landscape) were carefully examined for evidence of subsurface extent such as sinkhole development. All potential features identified were then subjected to further investigation including hand excavation and, where needed, excavation with mechanical aids such as jackhammers, back hoe, and hoe ram in order to determine their origin and potential hydrologic significance. As a result of excavation, 193 of the features investigated (approximately 90 percent) were determined to be non-sensitive and non-karst in origin. These included stump holes, animal burrows, and man-made excavation scars associated with ranching activities.

Twenty-seven features within the state-owned ROW were determined to be of karst origin and can be divided into sensitive and non-sensitive categories. Ten features were categorized as non-sensitive, primarily due to the presence of significant thickness of terra rossa clay infill (as much as 10 feet). Seventeen features were determined to be sensitive with the potential for rapid recharge according to TCEQ criteria. The sensitive features include five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge (**Table 3.3-2**). Some of these features were determined to be fault-related (SWCA and Cambrian Environmental, 2014b). The most significant of the sensitive karst features within the state-owned ROW include Cow Pattie Cave (F-18), Hat Sink (F-23), two adjacent un-named caves (F-64 and F-65), Jubilee Cave (F-110), SH 45 Cave (F-157a and F-157b), and MoPac Sink (F-170). **Figures 3.3-2** through **3.3-6** provide the locations of each of the 17 sensitive features as well as the anticipated limits of construction based on the proposed alignment. In addition, Flint Ridge Cave, a sensitive recharge feature that has its surface opening located approximately

150 feet outside and east of the state-owned ROW, is included in **Table 3.3-2** and **Figure 3.3-5** because a portion of the drainage area of the cave is within the state-owned ROW. Flint Ridge Cave is discussed further below. Additional information about the geological studies and photos of karst features are provided in the *Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays Counties, Texas* (SWCA and Cambrian Environmental, 2014b).

Table 3.3-2: Sensitive Karst Features in State-Owned ROW

Feature Number	Feature Description
F-16[1]	Potential sinkhole (located outside state-owned ROW)
F-18	Cave – “Cow Pattie Cave”
F-23	Sinkhole – “Hat Sink”
F-29b	Solution cavity
F-29c	Solution cavity
F-29d	Solution cavity
F-41	Solution cavity
F-55	Solution-enlarged fractures
F-62a[2]	Potential sinkhole (located outside state-owned ROW)
F-64	Cave
F-65	Cave
F-110	Cave – “Jubilee Cave”
F-157a	Cave – “SH 45 Cave”
F-157b	Cave – “SH 45 Cave”
F-161	Fault
F-22a	Solution cavity
F-170	Sinkhole – “MoPac Sink”
n/a	Flint Ridge Cave (described in text)[2]

[1]*Feature F-16 surface expression is located close to the boundary of the state-owned ROW and therefore is included here.*

[2]*Although the surface expressions of Feature F-62a and Flint Ridge Cave are located outside the state-owned ROW, they are included here because portions of their surface drainage basins are located within the state-owned ROW.*

Source: Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas in ***Appendix M: Biological Evaluation and Technical Reports***

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Figure 3.3-2: Karst Features in State-owned ROW (Map 1 of 5)

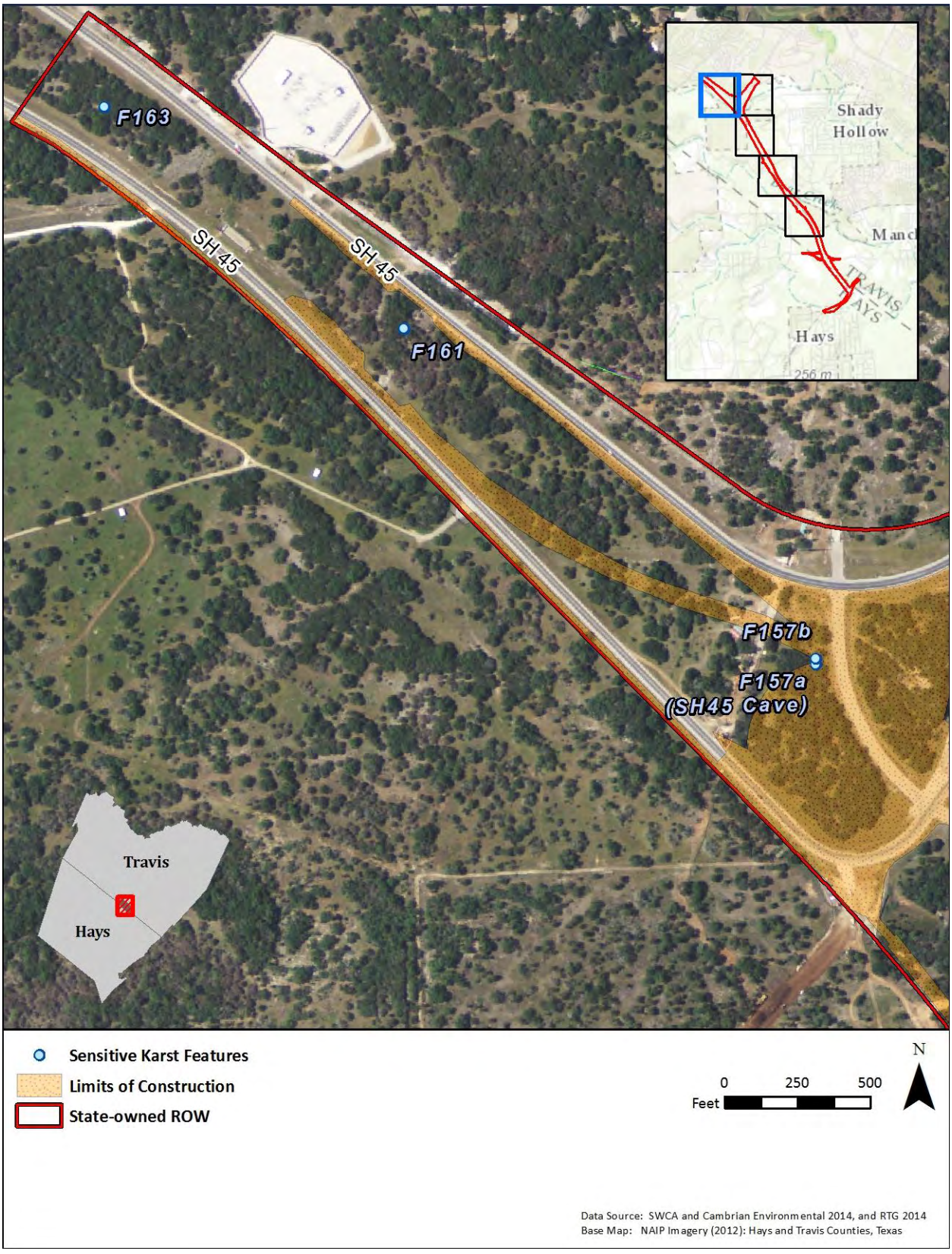

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Figure 3.3-3: Karst Features in State-owned ROW (Map 2 of 5)

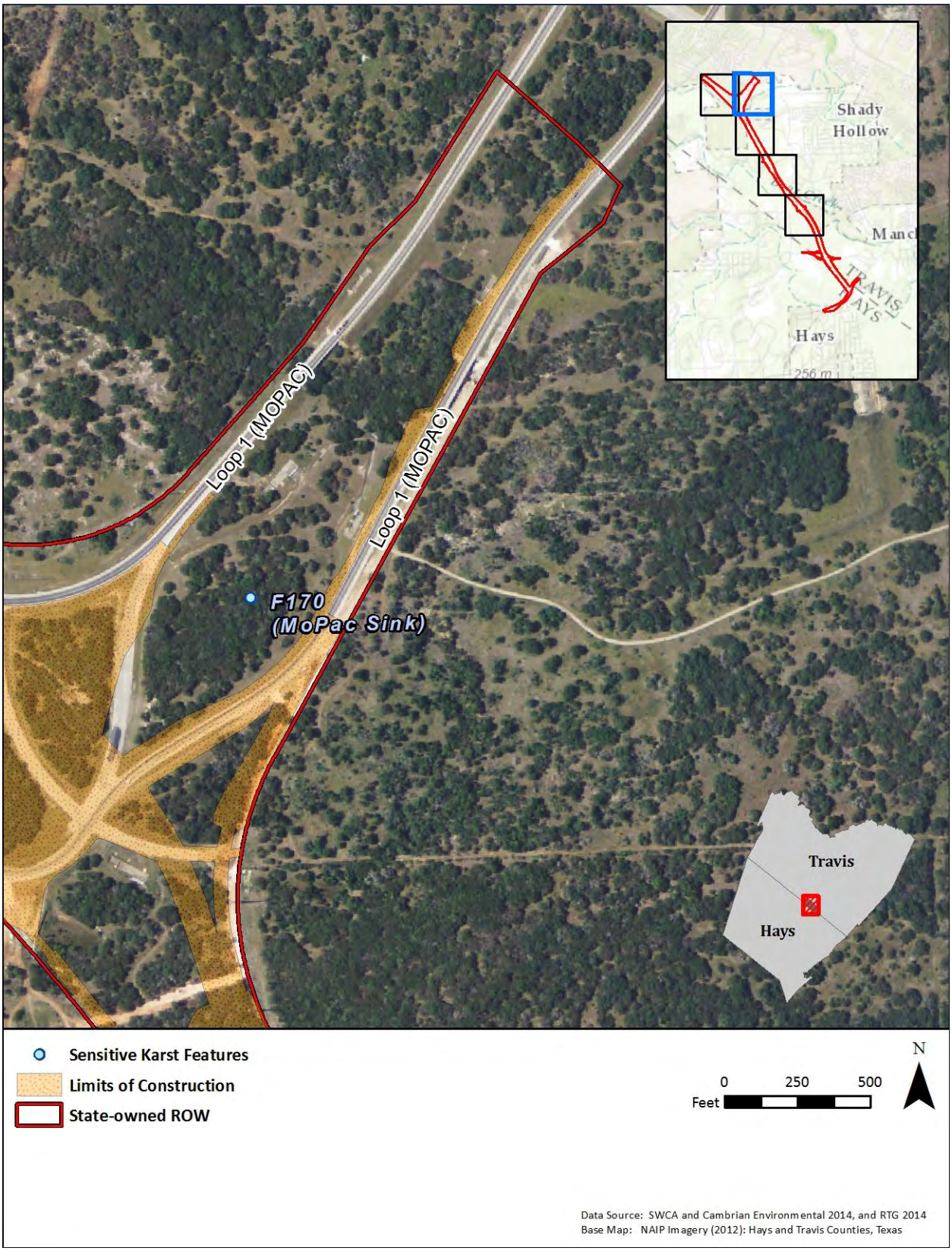

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Figure 3.3-4: Karst Features in State-owned ROW (Map 3 of 5)

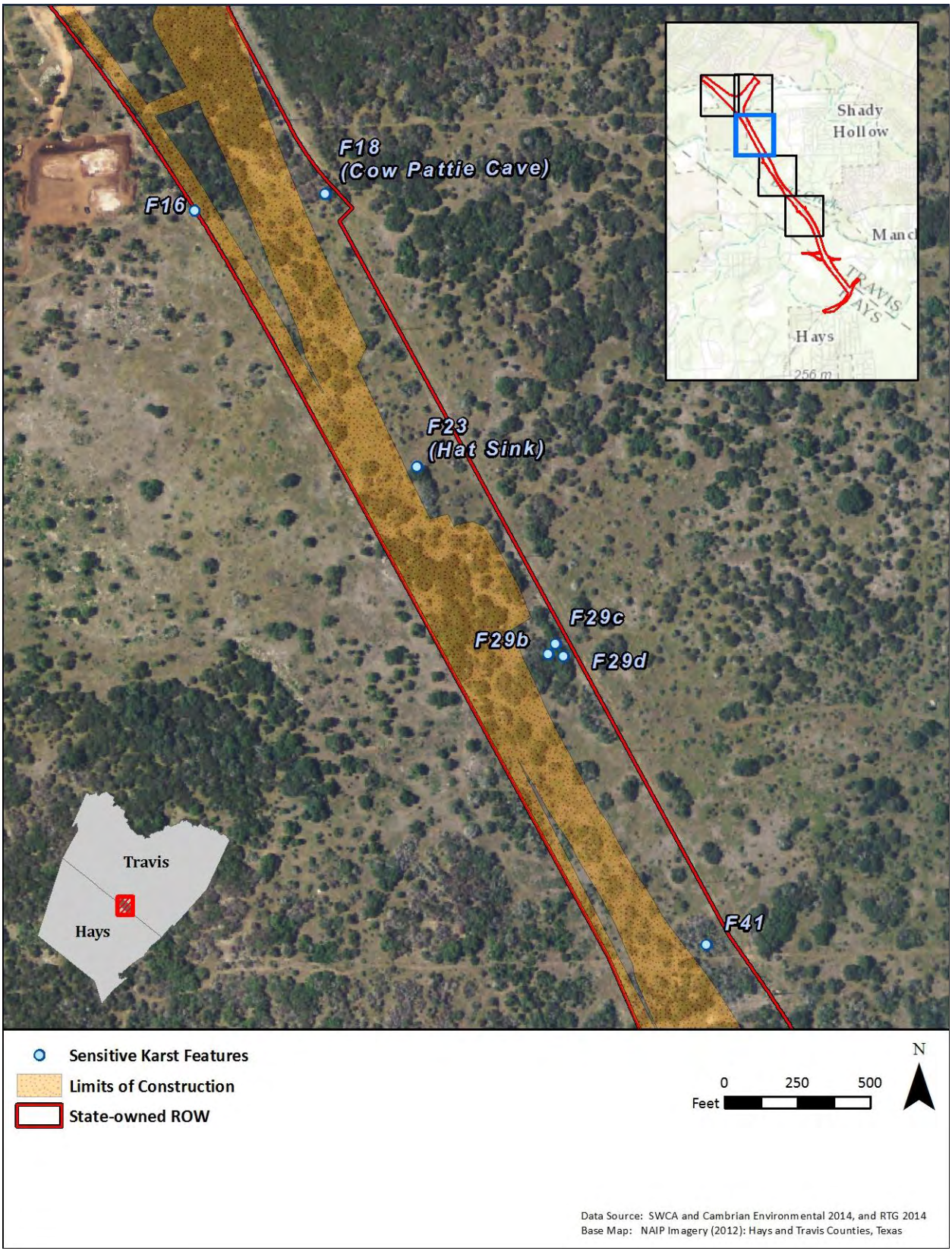

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Figure 3.3-5: Karst Features in State-owned ROW (Map 4 of 5)

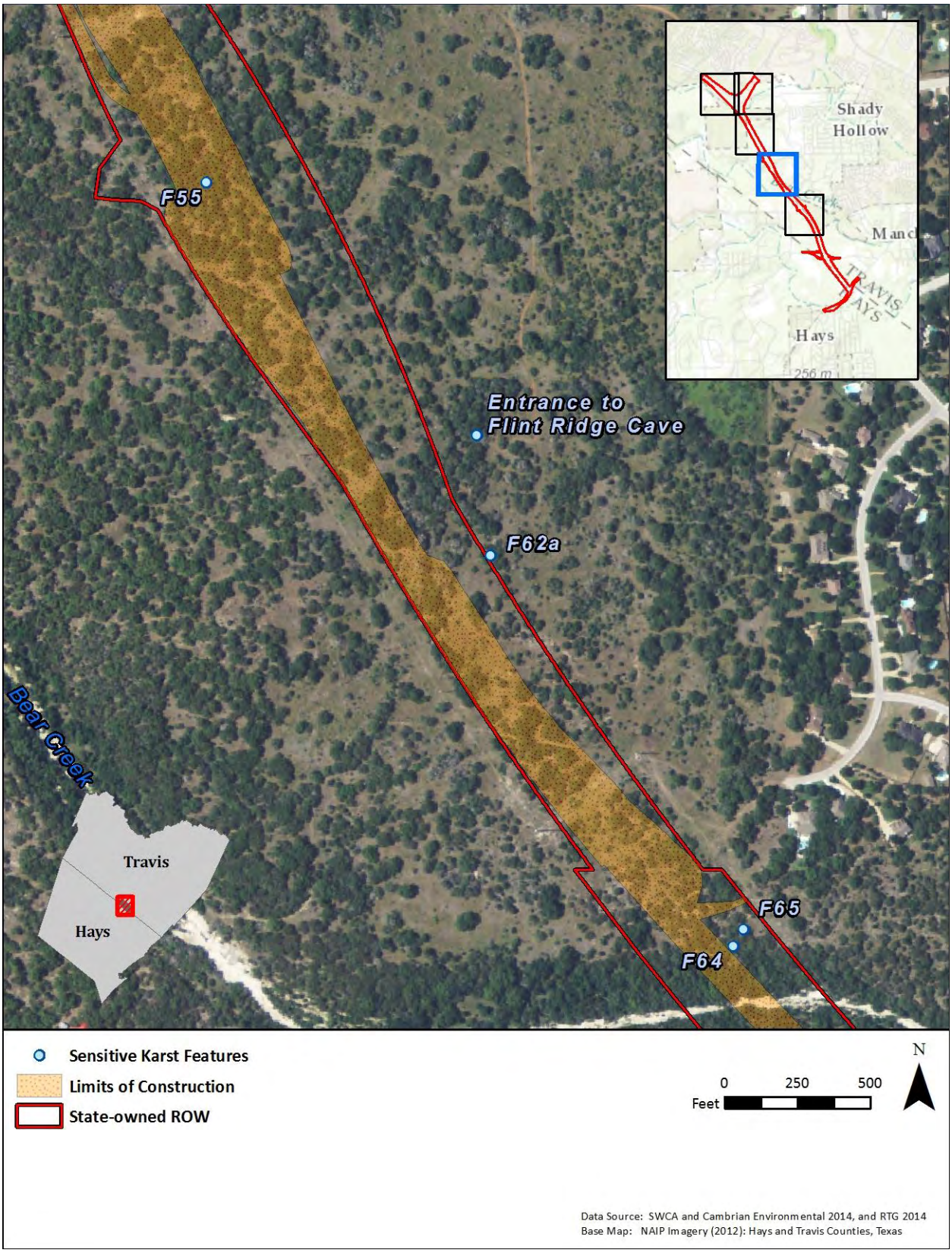

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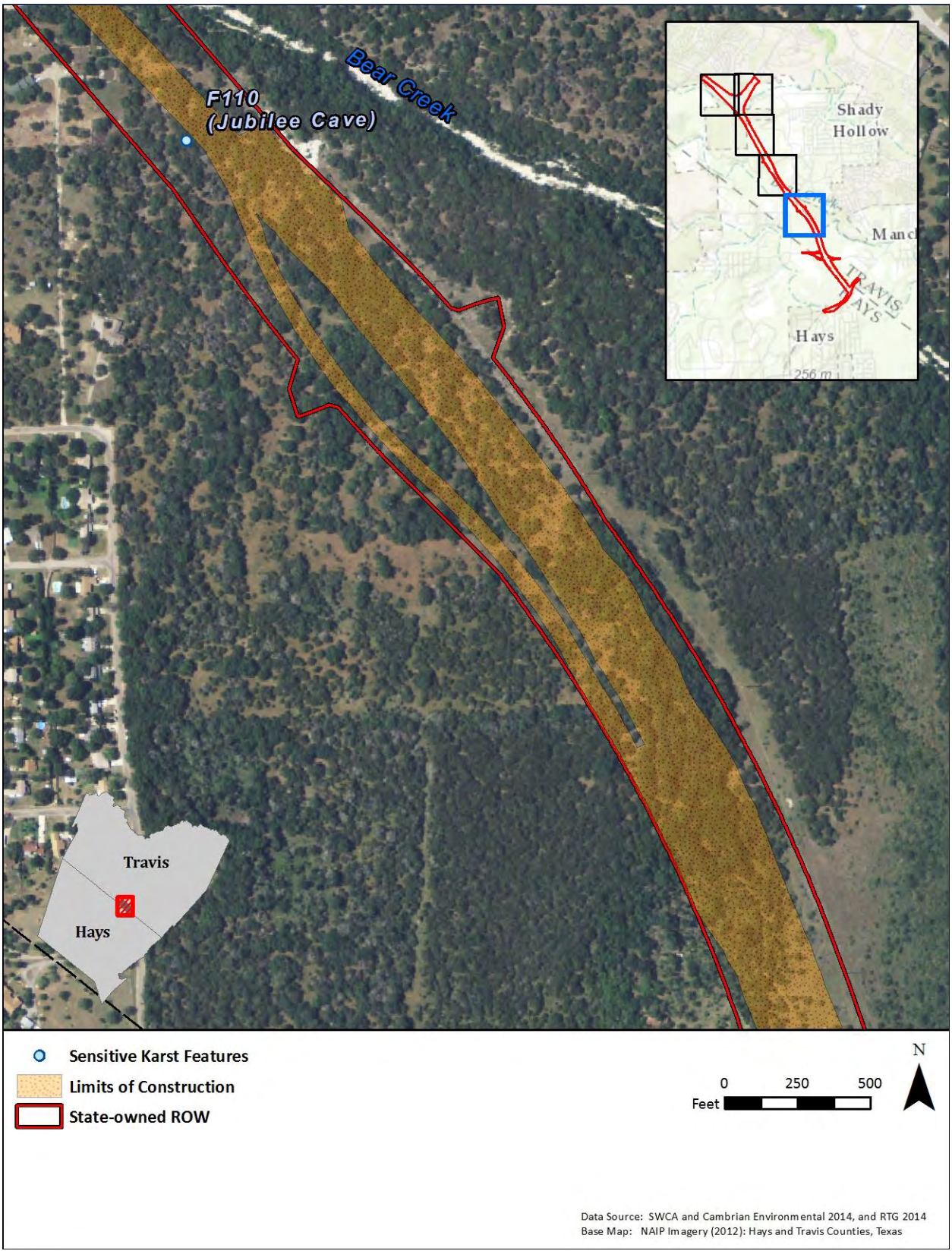
Figure 3.3-6: Sensitive Karst Features in State-owned ROW (Map 5 of 5)



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Additionally, Flint Ridge Cave is a sensitive recharge feature that has its surface opening located approximately 150 feet outside and east of the state-owned ROW (see **Figure 3.3-5** in **Section 3.3**); however, a portion of the drainage area of the cave is within the ROW. During field surveys, two cave radio monuments were located within the state-owned ROW representing the approximate locations of the terminal rooms (or ends of the cave) within Flint Ridge Cave. Although the entrance to Flint Ridge Cave is located outside the state-owned ROW, the southern end of the cave occurs beneath the ROW at depths generally between 120 and 150 feet below the surface. The state-owned ROW includes a portion of the surface drainage basin for Flint Ridge Cave, which has one of the largest surface drainage basins of an upland recharge feature known from the Edwards Aquifer Recharge Zone. The cave is known as one of the most significant upland recharge features in the Barton Springs segment of the Edwards Aquifer although, as discussed in **Section 3.6** below and the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**), its importance relative to recharge occurring within major creek channels is minor. (It has been estimated by Slade, Dorsey, and Stewart [1986] that approximately 85 percent of the water that recharges the Barton Springs segment enters the Edwards Aquifer from the channels of six major creeks that cross the Recharge Zone.) Relative to most caves in the Recharge Zone, the cave has an anomalously large surface catchment area. The catchment area for Flint Ridge Cave is located primarily within the Bear Creek watershed, but also includes a portion of the Slaughter Creek watershed (Hauwert, 2009; USGS, 1986). This feature is considered the fifth largest and second deepest cave in Travis County. The underground chambers of Flint Ridge Cave extend to the southwest from the surface cave opening. The cave has been surveyed to a depth of 154 feet below the land surface (or approximately 630 feet amsl) (Hauwert, 2009; USGS, 1986). Comparison of cave depth information with local topographic data indicates that the lower chambers of Flint Ridge Cave are at least 90 feet lower than the bed of Bear Creek (Russell, 1996; USGS, 1986; USGS, 1988).

Relationship of Geology to Groundwater

The Glen Rose Limestone of Lower Cretaceous age does not outcrop within the study area but functions as a lower confining unit below the Edwards strata across the study area (Small, Hanson, and Hauwert, 1996).

The majority of the study area is located within the Barton Springs segment of the Edwards Aquifer, a cavernous limestone aquifer that underlies much of central Texas, including portions of Travis and Hays counties (BSEACD, 2010). The groundwater hydrology within the study area is dependent primarily on the karst carbonate units of the Edwards Group.

The formations within the Edwards Group have been subdivided into eight hydrogeologic units (Units I through VIII, from the youngest to the oldest) based primarily on porosity and permeability differences observed in the field (Small, Hanson, and Hauwert, 1996). Although

most of the units are composed of limestone with varying amounts of dolomite, the permeability of the various units varies considerably. Hydrogeologic subdivision VI (Kirschberg Evaporite member) and subdivision III (Leached and Collapsed member) exhibit the highest overall permeability within the Edwards Aquifer (Small, Hanson, and Hauwert, 1996). A summary of the hydrogeologic units underlying the study area is presented in **Table 3.3-1**.

The Edwards Aquifer is divided into three distinct zones (Contributing, Recharge, and Transition) according to how water recharges over the zone. The Contributing Zone includes up-gradient areas (generally to the northwest of the study area) where rainfall runs off into streams or infiltrates into a shallow water table before eventually reaching the Recharge Zone (Small, Hanson, and Hauwert, 1996; Smith, Hunt, and Schindel, 2005).

The Recharge Zone includes areas of highly fractured and faulted carbonate rocks of the Edwards Group outcrop. This portion of the aquifer receives local recharge directly through the outcrop and the aquifer is considered to be unconfined. The magnitude and rate of recharge in a particular area depend on various factors, including the amount of precipitation, the rate of precipitation, antecedent moisture conditions, the hydraulic conductivity of the soil, the presence or absence of cracking soil, the microtopography (or the degree of local surface irregularity), the distribution of macropores in bedrock, and other factors (Hopp and McDonnell, 2009). Estimates of the percentage of direct precipitation that actually contributes to recharge of the Barton Springs segment of the Edwards Aquifer range from approximately six percent to approximately 31.5 percent (Hauwert, 2009; Slade, Dorsey, and Stewart, 1986).

The principal water-bearing units of the Edwards Aquifer are the Kainer and Person Formations of the Edwards Group and the overlying Georgetown Formation (Small, Hanson, and Hauwert, 1996; Smith, Hunt, and Schindel, 2005). Groundwater generally flows from the southwest to the northeast in a series of fault blocks associated with the Balcones Fault Zone (Smith, Hunt, and Schindel, 2005; Smith, Hunt, and Johnson, 2012; Smith, Veni, and Elliott, 2013).

The boundary of the Edwards Aquifer Recharge Zone with the Transition (or “artesian”) Zone generally follows a northeast to southwest trending fault that extends from Travis County into Hays County (Smith, Hunt, and Schindel, 2005). Within the Transition Zone section of the study area, the Edwards Aquifer is confined by as much as 150 feet of confining strata within the Del Rio Clay, the Buda Limestone, and the Eagle Ford Group (Small, Hanson, and Hauwert, 1996). In addition, surficial deposits of alluvium occur along the lower channel of Bear Creek. The alluvial deposits are highly variable, ranging from clay and silt to gravel and boulders, with variable hydrologic conductivity (USDA, 1974; USDA, 1984). The Edwards Aquifer zones underlying the study area are discussed further in **Section 3.6** and are shown in **Figure 3.6-1**.

Soils

Soil Units in the Study Area

Soils within the study area were formed from weathered limestone in upland areas within the Edwards Plateau; from marl, clay, and other sediments in the transitional zone between the Edwards Plateau and the Blackland Prairies; and from mixed alluvial sediments in floodplains of creeks and smaller tributaries (USDA 1974; USDA, 1984). The Travis County and Hays County soil survey reports describe general soil conditions within the study area; however, the thickness of the soil cover within the study area is highly variable (USDA 1974; USDA, 1984). Locally, soil thickness is related to geomorphic position, the nature of parent material, and erosion-sedimentation processes (Minasny and McBratney, 2001; Molnar, Anderson, and Anderson, 2007; Tye et al., 2011; USDA, 1974; USDA, 1984). The soils in the area also exhibit considerable variation in permeability and shrink-swell characteristics (NRCS, 2013b; USDA, 1974; USDA, 1984; USDA, 1986). Dominant soil units include Speck stony clay loam, Rumple-Comfort association, and Tarrant soils. However, soil survey mapping units have limited resolution and cannot be considered site-specific for geotechnical or construction purposes (USDA 1974; USDA, 1984).

The U.S. Department of Agriculture (USDA) has devised a classification system for soils based on their hydrologic properties. Soils are classified within one of four groups: A, B, C, or D. Type “A” soils, including the mixed alluvial land present along Bear Creek, have a high infiltration rate with low runoff potential when thoroughly wet and have a high rate of water transmission (USDA, 1986). This description fits with knowledge that most recharge to the Barton Springs segment of the Edwards Aquifer occurs in major creek channels (see **Section 3.6**). Soils underlying much of the state-owned ROW are classified as Type “C” (soils that have a low infiltration rate when thoroughly wet and generally impede downward movement of water) or Type “D” (soils that have a very slow infiltration rate, a very slow rate of water transmission, and very high potential for runoff when thoroughly wet) (USDA, 1986). Thus, nearly all of the Recharge Zone in the state-owned ROW, including all of the Flint Ridge Cave drainage area, is covered by soils that impede downward movement of water. As discussed in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**), the state-owned ROW is located within an outcrop of terra rossa, a terrain type with relatively deep heavy clay soils that does not display the typical characteristics of the Edwards Aquifer Recharge Zone.

In 2005, TxDOT commissioned a detailed site-specific investigation of soil conditions in the state-owned ROW. The findings of this study, which are presented in Wilding (2005) and summarized in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**) and *Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays*

Counties, Texas (SWCA and Cambrian Environmental, 2014b) , discussed the soil properties in the state-owned ROW and impacts of these properties on the potential for recharge in the area. Overall, it was found that soil properties in the state-owned ROW, including the high clay content of the soil, serve as strong buffers to aquifer contamination.

Prime and Other Important Farmland Soils

The Farmland Protection Policy Act (FPPA) is not applicable to the proposed project because the project is state-funded, would occur entirely within existing state-owned ROW, and would not require new ROW.

Hydric Soils

Although the proposed project is a state-funded project, Natural Resources Conservation Service (NRCS) guidance was used as general guidance in identifying hydric soils in the study area. Hydric soils were defined by the National Technical Committee for Hydric Soils as soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS, 2013a). Only 12.5 acres of recognized hydric soil are mapped within the study area, entirely within a polygon of the Orif soils mapping unit (Or) in Hays County (NRCS, 2013b; USDA, 1974; USDA, 1984). However, soil survey information is not site-specific and does not preclude the need for on-site investigation (USACE, 2010).

3.3.2 Direct Effects

The following sections discuss the probable beneficial and adverse environmental effects of the Build and the No Build Alternatives on soil and geologic resources.

Build Alternative

Under the Build Alternative, the effects of construction on soils would vary, depending on the type of construction activity underway. Construction activities could increase the potential for soil compaction, erosion, or sedimentation. Erosion and sediment control measures would effectively minimize erosion and soil loss during construction of the Build Alternative. Long-term impacts to area soils would be reduced through the use of BMPs to minimize erosion.

Impacts of the Build Alternative on geologic resources are anticipated to be minor. Construction activities may expose geologic units near the surface to erosion, but erosion would be minimized by incorporating proper protection techniques during construction. Examples of proper erosion control techniques that may be used during construction include dust control, mulching, and erosion control blankets.

No impacts to hydric soils associated with the proposed project are expected, as there are no mapped hydric soils in the state-owned ROW (NRCS, 2013b). Because the proposed project is state-funded, no coordination with the NRCS or the USDA would be required.

The proposed roadway alignment and profile have been designed to avoid permanent filling or other direct impacts to the openings or surface expressions of the seventeen sensitive karst features in the state-owned ROW to the extent practical. Approximately 90 percent of the proposed SH 45SW roadway between FM 1626 and MoPac would be built on fill to control direction of surface water runoff. Approximately 20 percent of these fill areas would be elevated and separated from grade level by retaining walls in the vicinity of sensitive karst features. Also to reduce possible impacts to sensitive karst areas, total roadway width is proposed to be minimized north of Bear Creek. This segment of roadway would be constructed without a median, with westbound and eastbound travel lanes separated by concrete barriers for safety purposes. Drainage slots and/or inlets would be placed along the median barrier and inlets would be placed along the lower edge of the roadway barrier to capture roadway runoff and convey it to a water quality pond for treatment.

The proposed project would impact the surface drainage basins of three sensitive features, including two in the state-owned ROW (F-55 and F-23 [Hat Sink]). The third feature, Flint Ridge Cave, is located outside of the state-owned ROW. The proposed project would not impact the openings, surface expressions, or surface drainage basins of the fifteen remaining sensitive features. At feature F-55, which is a series of solution-enlarged fractures located in the exposed bedrock in a drainage swale, a bottomless culvert is proposed to span the feature. This 12-foot by 4-foot culvert would be installed above the natural drainage channel and allow for drainage to continue, thereby maintaining recharge potential of this feature. The surface drainage area of feature F-55 is approximately 16.26 acres within and to the west of the state-owned ROW; approximately 2.24 acres (approximately 13.8 percent) would be removed by the proposed project. To compensate for this loss of drainage area, vegetated diversion dikes would be utilized on both sides of the proposed roadway to divert water toward feature F-55, therefore maintaining recharge potential at this feature. Natural runoff would not be allowed to comingle with roadway runoff; roadway runoff would enter the BMP treatment system and would be treated before its release.

Feature F-23 (Hat Sink) is a sinkhole located in the state-owned ROW east of the proposed roadway. No impacts to the surface expression of this feature are anticipated. The surface drainage basin of Hat Sink is approximately 1.19 acres and extends across the state-owned ROW and to the west. Drainage to Hat Sink would be maintained by a culvert that would allow water to flow from the natural drainage basin under the roadway and then into Hat Sink. The proposed roadway would result in the removal of approximately 0.13 acre (approximately 10.9 percent) of the drainage area of Hat Sink; a compensatory area from off-site to the south would be re-routed to this feature to maintain the recharge potential of Hat Sink. The re-routed water would be diverted by a vegetated diversion dike located west of the proposed roadway.

Natural runoff would not be allowed to comingle with roadway runoff; roadway runoff would enter the BMP treatment system and would be treated before its release.

A portion of the surface drainage area of Flint Ridge Cave occurs in the state-owned ROW. Under the Build Alternative, approximately 1.3 percent (approximately 0.7 out of approximately 55.5 acres) of the surface catchment basin would be covered by impervious surfaces. However, with the proposed design, no runoff from disturbed areas or the eventual roadway surface would enter the cave opening. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom on the rail. These inlets would be connected to accompanying stormwater infrastructure that would convey roadway runoff to a water quality pond situated outside the Flint Ridge Cave surface catchment basin, where the water would be treated and then discharged to Bear Creek. No untreated runoff associated with the roadway would enter Flint Ridge Cave or its surface watershed. In addition, to mitigate for the portion of the catchment basin of Flint Ridge Cave being removed by the Build Alternative, drainage to Flint Ridge Cave would be maintained by re-routing an equivalent acreage of natural runoff into the cave's surface drainage area. This natural runoff would not be allowed to comingle with roadway runoff. The size of the Flint Ridge Cave watershed would be maintained. Roadway runoff from the impacted portions of the Flint Ridge Cave surface catchment area would enter the BMP treatment system and would be treated before its release to Bear Creek and possible recharge to the aquifer. More details regarding protection of these sensitive features, including plans for water quality protection, are provided in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report*** and the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports)**. A discussion on the ecological integrity of Flint Ridge Cave is provided in **Appendix M: Biological Evaluation and Technical Reports** in the technical report *Final Draft: Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas*.

The proposed project would include BMPs that would collect and treat runoff prior to discharging it offsite. Implementation of robust BMPs during construction and operation of SH 45SW, including erosion controls, sediment controls, and post-construction controls, would mitigate impacts to water quality by removing pollutants that occur as particulates, including total suspended solids (TSS). Post-construction BMPs would remove at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone. Stormwater runoff would also be treated by BMPs over the Transition Zone, although treatment over the Transition Zone is not required by TCEQ. Examples of structural BMPs that would be used during project construction include mulch logs, rock filter dams, silt fences, PFC pavement, VFS, grassy swales, and water quality ponds. Non-structural BMPs typically emphasize source control practices designed to minimize and/or prevent the accumulation of pollutants; examples of non-structural BMPs include native/xerophytic

vegetation propagation, pesticide management, mowing schedule, and street sweeping. These BMPs are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**. Potential hazardous material containment would be addressed through the use of several BMPs, including the placement of water quality ponds designed to also serve as hazardous materials traps. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series, with each in the series removing additional TSS and other pollutants. TSS removal rates through these BMPs applied in a series would be at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone, as mentioned above and discussed in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***.

Within the proposed project vicinity, the Texas Commission on Environmental Quality (TCEQ) has regulatory authority over the Edwards Aquifer and enforces protective measures that would affect the construction and operation of the proposed project. The TCEQ administers the Edwards Aquifer Protection Program and provides guidelines on complying with the Edwards Aquifer Rules (30 TAC 213). TCEQ enforces the Edwards Aquifer Rules by requiring the submittal and approval of Water Pollution Abatement Plans (WPAPs) before initiation of a regulated activity. A WPAP, which must include a Geologic Assessment, would be prepared for the proposed project. The Edwards Aquifer Rules require that TCEQ provide copies of the WPAP to affected cities, counties, and groundwater conservation districts. These entities and the general public may review and comment on the WPAP application when it is filed; thus there will be a public participation opportunity at that time (30 TAC 213.4 (a) (2)).

No Build Alternative

The No Build Alternative would not require soil-disturbing construction activities and therefore, would not increase erosion or adversely impact soils or geologic resources. Karst features in the ROW would not be impacted by the No Build Alternative.

3.3.3 Encroachment-Alteration Effects

Due to the lack of frontage roads associated with the Build Alternative and the prevalence of WQPLs (protected in perpetuity from development) along most of the route, encroachment-alteration impacts to geology and soils as a result of the Build Alternative would be limited. Use of BMPs would minimize erosion and sedimentation. Placement of the roadway and altering flow for drainage compensation areas could encroach on the surface or subsurface drainage areas of adjacent caves/sensitive features, altering the hydrologic regime in those features.

3.4 Air Quality

The proposed action is consistent with CAMPO's *2035 RTP* (2010). As a state-funded project, inclusion in the Transportation Improvement Program (TIP) is not necessary. The proposed project is located in Hays and Travis counties, which is in an area in attainment or unclassifiable for all national ambient air quality standards (NAAQS); therefore, the transportation conformity rules do not apply.

In January 2014, the Austin-Round Rock MSA, consisting of Bastrop, Caldwell, Hays, Travis, and Williamson counties, entered into the Ozone Advance Action Plan with TCEQ and the Environmental Protection Agency (EPA). The plan builds on the work of previous plans – the One Hour Ozone Flex Plan (2002), Early Action Compact State Implementation Plan (2004), and Eight Hour Ozone Flex Plan (2008) – and is intended to keep the region in attainment of the current ozone standard of 75 parts per billion, reduce ozone levels enough to remain in attainment of anticipated future standards, and improve public health, particularly for vulnerable populations. The Ozone Advance Action Plan is in effect until December 31, 2018. The Austin-San Marcos area also participates in the EPA's eight-hour Ozone (O3) Flex Program and the Austin-Round Rock-San Marcos area participates in the EPA's Ozone Advance Program. Participation in these voluntary programs has resulted in the development and implementation of an emission reduction plan to assure attainment of the eight-hour ozone standard by 2007 and maintenance through 2015. Through these efforts, directed by the elected officials of the Central Texas Clean Air Coalition (CAC), the region has maintained compliance with the federal ozone standard despite a population growth rate that far exceeds the state and national averages. Due to the efforts of CAC under the Eight Hour Ozone Flex Plan, the Austin-Round Rock MSA was designated in attainment for 8-hour ozone as of July 2012 (TCEQ, 2013).

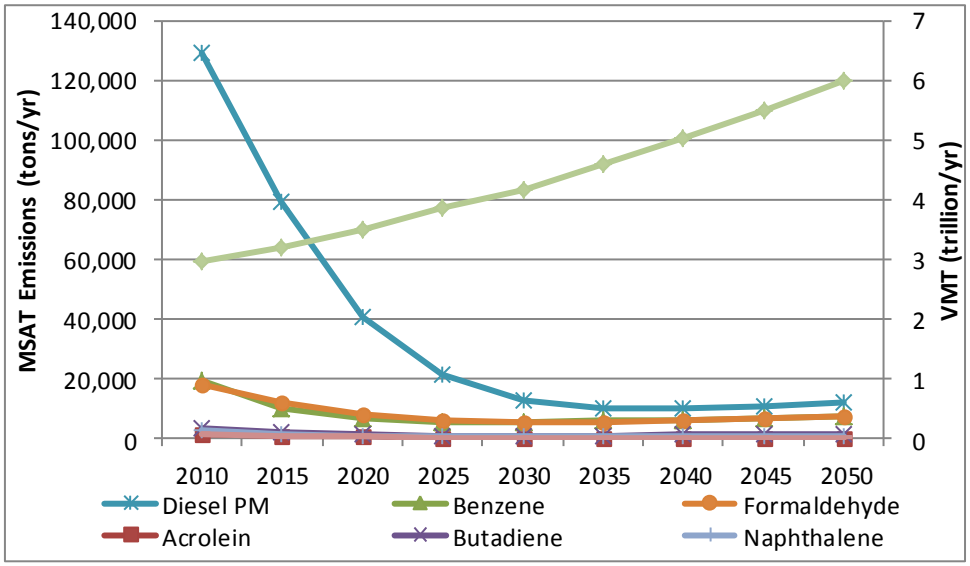
Projected traffic data for the design year 2035 is approximately 34,400 vehicles per day (vpd). A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an AADT below 140,000. The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel

particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA Mobile Source Air Toxics (MSAT) rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA's Motor Vehicle Emission Simulator (MOVES) 2010b model, as shown in **Figure 3.4-1** and **Table 3.4-1**, even if vehicle miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 3.4-1: Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways using EPA's MOVES2010b Model



Source: ***Table 3.4-1****.*

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Table 3.4-1: Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways using EPA's MOVES 2010b Model

Pollutant / VMT	Pollutant Emissions (tons) and Vehicle Miles Traveled (VMT) by Calendar Year									Change
	2010	2015	2020	2025	2030	2035	2040	2045	2050	2010 to 2050
Acrolein	1,244	805	476	318	258	247	264	292	322	-74%
Benzene	18,995	10,195	6,765	5,669	5,386	5,696	6,216	6,840	7,525	-60%
Butadiene	3,157	1,783	1,163	951	890	934	1,017	1,119	1,231	-61%
Diesel PM	128,847	79,158	40,694	21,155	12,667	10,027	9,978	10,942	11,992	-91%
Formaldehyde	17,848	11,943	7,778	5,938	5,329	5,407	5,847	6,463	7,141	-60%
Naphthalene	2,366	1,502	939	693	607	611	659	727	802	-66%
Polycyclics	1,102	705	414	274	218	207	219	240	262	-76%
Trillions VMT	2.96	3.19	3.5	3.85	4.16	4.58	5.01	5.49	6	102%

Source: EPA MOVES2010b model runs conducted during May – June 2012 by FHWA

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making. The FHWA, EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects.

Project-Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:
http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf.

For the Build Alternative in this document, the amount of MSAT emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is slightly higher than that for the No Build Alternative because the additional capacity increases the efficiency of the roadway network and attracts rerouted trips from elsewhere in the transportation network. This increase

in VMT would lead to higher MSAT emissions for the preferred action alternative (Build Alternative) along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all the priority MSAT decrease as speed increases. Because the estimated VMT under the Build and No Build Alternatives are nearly the same, varying by less than 15 percent, it is expected there would be no appreciable difference in overall MSAT emissions between the alternatives. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

There may be localized areas where ambient concentrations of MSAT could be higher under the Build Alternative than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the new roadway sections that would be built between FM 1626 and MoPac under the Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT would be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

Information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. It is the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air

pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. It maintains the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect

public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

In this document, a qualitative MSAT assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that the Build Alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

3.5 Noise Environment

3.5.1 Existing Conditions

This analysis was accomplished in accordance with TxDOT's (FHWA-approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011).

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as *dB*.

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as *dBA*.

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as *Leq*.

The traffic noise analysis process includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise,
- Determination of existing noise levels,
- Prediction of future noise levels,
- Identification of possible noise impacts, and
- Consideration and evaluation of measures to reduce noise impacts.

FHWA has established the following Noise Abatement Criteria (NAC), shown in **Table 3.5-1**, for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur. As reflected in TxDOT's *Guidance for Analysis and Abatement of Roadway Traffic Noise* (TxDOT, 2011), TxDOT has adopted the federal NACs as its standard.

Table 3.5-1: FHWA Noise Abatement Criteria (NAC)
[Hourly A-Weighted Sound Level decibels (dBA)]

Activity Category	FHWA Activity Criteria dBA Leq(h) [1]	Activity Description
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

1: Primary consideration is given to exterior areas (Category A, B, C, or E) where frequent human activity occurs.
Source: FHWA, 2010; TxDOT, 2011.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute criterion: The predicted noise level at the receiver approaches, equals, or exceeds the NAC. Approach is defined as one (1) dBA below the NAC (TxDOT, 2011). For example, a noise impact would occur at an exterior activity area of a Category B residence if the noise level is predicted to be 66 dBA or above.

Relative criterion: The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the NAC. *Substantially exceeds* is defined as more than 10 dBA (TxDOT, 2011). For example: a noise impact would occur at an exterior activity area of a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

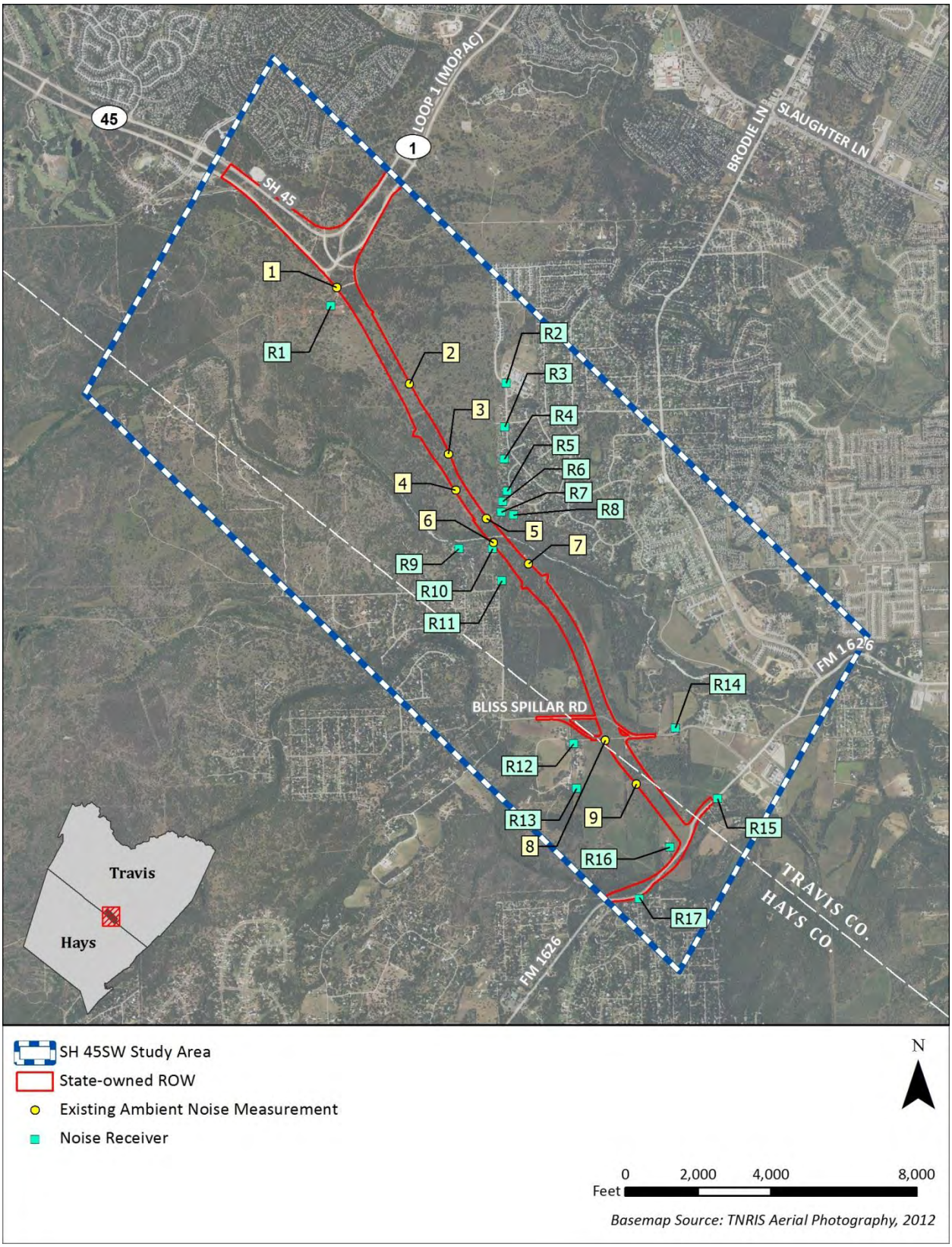
Land use activity categories located within the SH 45SW study area include: residential (Category B); schools, community parks and parkland, places of worship, and public or nonprofit institutional structures (Category C); utilities, including COA WQPLs (Category G); and undeveloped land (Category G).

Residential land use comprises approximately 31 percent of land use in the study area and primarily consists of single family residential developments. Residential land use is located primarily in the northern (Circle C Ranch subdivision), central (Southwest Territory, Arrowhead Acres, and Shady Hollow subdivisions) and southeastern portions of the study area with some low density single family dwellings located along Bliss Spillar Road and FM 1626. Parkland or protected areas, including the WQPL, comprise approximately 35 percent of land use in the study area. Vacant, undeveloped land comprises roughly 20 percent of the land use in the study area. Based on the above described existing land uses, the study area can be categorized mostly under activity categories B, C and G.

Current noise sources include high speed traffic on MoPac and SH 45 in the northwest portion of the study area, roadway traffic on Bliss Spillar Road and FM 1626 in the middle and southeastern portion of the study area, and local traffic on residential streets in the adjacent neighborhoods. A large portion of the study area is vacant, undeveloped land, with no known noise generators.

The FHWA Traffic Noise Model 2.5 (TNM 2.5) was used to calculate existing traffic noise levels at representative receivers along Bliss Spillar Road and FM 1626. These residential receivers are R14, R15, R16 and R17 (see **Figure 3.5-1**). The receiver locations are generally identified as outdoor areas that experience frequent human activity and might be impacted by highway traffic noise. Based on the model, existing exterior noise levels ranged from 51 dBA at receiver R14 located along Bliss Spillar Road to 69 dBA at receiver R15 located along FM 1626.

Figure 3.5-1: Noise Receivers and Baseline Point Locations



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Many of the receivers located along the proposed SH 45SW corridor are located in isolated areas, not influenced by traffic noise from existing high speed facilities. In order to establish existing noise levels along the proposed SH 45SW corridor, baseline readings were collected in February 2014. These measurements were collected using a Larson Davis LxT2 noise meter. The measurements were made during peak traffic volume hours in order to capture worst case noise levels from MoPac, Brodie Lane, Bliss Spillar Road, and FM 1626. The measurement sites were chosen to be close to identified receptors and spaced out along the proposed SH 45SW corridor in order to obtain a representative sample of the existing noise levels. Nine ambient noise readings were collected within the study area. The nine ambient noise readings were chosen to represent the existing noise levels for corresponding receptor(s) located in an isolated area near the proposed facility. These ambient noise levels and corresponding receptors are described in **Table 3.5-2** below. The existing ambient readings range from 32 dBA in the center of the study area (measurement location 7) to 68 dBA near FM 1626 (measurement location 8). The ambient measurement locations are shown in **Figure 3.5-1** and the measured noise levels are provided in **Table 3.5-2**.

Table 3.5-2: Existing Ambient Noise Levels

Ambient Measurement Location	Receptor Represented	Measured dBA (Leq)
1	R1	57.9
2	R2	43.9
3	R3, R4	44.3
4	No receptor represented	39.3
5	R5, R6, R7, R8	43.6
6	R9, R10	40.7
7	R11	32.0
8	R12	68.0
9	R13	54.9

Source: CP&Y, 2014a

3.5.2 Direct Effects

Build Alternative

FHWA TNM 2.5 was used to calculate the predicted traffic noise levels. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills, and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Predicted traffic noise levels were modeled at receiver locations that represent the land use activity areas adjacent to the Build Alternative that might be impacted by traffic noise and

potentially benefit from feasible and reasonable noise abatement. This data is presented in **Table 3.5-3**. Although the use of different pavement types is not an approved noise mitigation measure, the use of PFC pavement on this project is likely to result in lower noise levels than those projected by the model results.

Table 3.5-3: Traffic Noise Levels dBA (Leq)

Site ID	Location	NAC Activity Category	NAC Level	Existing (2013)	Predicted (2035)	Change (+/-)	Noise Impact
R1	Representative Receiver at Greyrock Ridge Neighborhood	B	67	54*	56	+2	No
R2	Bailey Middle School	C	67	43	43	0	No
R3	Residence on Lost Oasis Hollow	B	67	44	44	0	No
R4	Residence on Lost Oasis Hollow	B	67	44	47	+3	No
R5	Residence on Red Mesa Hollow	B	67	43	52	+9	No
R6	Residence on Red Mesa Hollow	B	67	43	56	+13	Yes
R7	Residence on Red Mesa Hollow	B	67	43	60	+17	Yes
R8	Residence on Red Mesa Hollow	B	67	43	57	+14	Yes
R9	Residence on private drive off Bliss Spillar Road	B	67	40	54	+14	Yes
R10	Residence on private drive off Bliss Spillar Road	B	67	40	66	+26	Yes
R11	Residence on private drive off Bliss Spillar Road	B	67	32	52	+20	Yes
R12	Residence off Old Bliss Spillar Road	B	67	68	54	-14	No
R13	Residence off Old Bliss Spillar Road	B	67	54	50	-4	No
R14	Residence on Bliss Spillar Road	B	67	51	60	+9	No

Table 3.5-3: Traffic Noise Levels dBA (Leq) cont'd

Site ID	Location	NAC Activity Category	NAC Level	Existing (2013)	Predicted (2035)	Change (+/-)	Noise Impact
R15	Residence on FM 1626	B	67	69	70	+1	Yes
R16	Residence on FM 1626	B	67	55	64	+9	No
R17	Residence on FM 1626	B	67	75	64	-11	No

** This value was derived from the nearest ambient measurement of 57.9 dB at Location 1, minus 3 dB from attenuation due to the increased distance between the noise source and the modeled receiver.*
Source: CP&Y, 2014b

As indicated in **Table 3.5-3**, receiver R13 had a modeled decrease in sound level due to the realignment and configuration of Bliss Spillar Road. This could be because the proposed roadway at Bliss Spillar Road is further away from this receiver. Receiver R17 represents receivers located adjacent to the northbound side of the current FM 1626 alignment. As the proposed alignment of FM 1626 is shifted west, the proposed roadway would be located further from R17. As a result, the modeled noise levels at this location indicate a decrease of 11 dBA. As indicated in **Table 3.5-3**, the proposed project would result in traffic noise impacts due to a substantial increase at receivers R6, R7, R8, R9, R10, and R11. The impacted receivers are shown in **Figure 3.5-2** below. Receiver R15 is also impacted based on the noise level for residential land use activity (NAC B) criteria.

As indicated in **Table 3.5-3**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone, and the construction of noise barriers. Before any abatement measure can be proposed for incorporation into the proposed project, it must both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50 percent of impacted first row receivers by at least five dBA; and to be "reasonable," it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least five dB(A), and the abatement measure must be able to reduce the noise level for at least one impacted first row receiver by at least seven dBA.

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dBA per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments: the impacted receivers are located on either side of a narrow gap in the center of the proposed alignment. Horizontal

alteration of the alignment would place the roadway closer to one of the impacted receivers. It would also affect the geometry of the channel crossing at Bear Creek. Vertical alteration would require a large cut in the area of the Bear Creek crossing and would not be feasible.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations.

Noise barriers would not be feasible and reasonable for any of the following impacted receivers and, therefore, are not proposed for incorporation into the proposed project:

Receivers R6, R7 and R8: these receivers represent individual residences in the Shady Hollow Estates neighborhood. Noise barriers that would achieve the minimum feasible reduction of five dBA at greater than 50 percent of first row receivers and reduce the noise level at one or more receivers by at least seven dBA would exceed the reasonable, cost-effectiveness criterion of $25,000.

Receivers R9, R10 and R11: these receivers represent three separate, individual residences. Noise barriers that would achieve the minimum feasible reduction of five dBA at greater than 50 percent of first row receivers and reduce the noise level at one or more receivers by at least seven dBA would exceed the reasonable, cost-effectiveness criterion of $25,000.

Receiver R15: this receiver represents two residences with driveways facing FM 1626. A continuous noise barrier would restrict access to these residences. Gaps in a noise barrier would satisfy access requirements but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of five dBA at greater than 50 percent of first row receivers and reduce the noise level at one or more receivers by at least seven dBA.

The Greyrock Ridge subdivision is a platted residential development with 387 planned lots and is located adjacent to the west side of the SH 45SW ROW. Many of these lots back up to the proposed SH 45SW facility. However, after consultation with the developer representative it was determined that a building permit has been issued for only one section of the subdivision. Receiver R2, which would not be impacted by the proposed project, was located at the closest permitted lot to the roadway to determine potential impacts on this newly developed neighborhood.

Noise Planning

To avoid noise impacts that may result from future development of properties adjacent to the proposed project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted 2035 noise impact contours shown in **Table 3.5-4**. The noise impact zone is

the distance from the roadway in which traffic levels are 66 dBA or 71 dBA or greater. For the SH 45SW corridor, the future 66 dBA impact zone varies from 97 to 183 feet from the centerline of the proposed roadway on both the southbound and northbound sides. The future 71 dBA impact zone varies from zero to 116 feet from the centerline of the proposed roadway on each side of the roadway. The future 66 dBA and 71 dBA impact zones for predicted traffic volumes are shown in **Figures 3.5-2** through **3.5-7** and tabulated in **Table 3.5-4**.

Table 3.5-4: Proposed Contours

Location	Distance from Centerline	
	66 dbA	**71 dbA**
Station 195 NB SH-45	132 ft	23 ft
Station 195 SB SH-45	150 ft	74 ft
Station 230 NB SH 45	97 ft	0 ft
Station 230 SB SH 45	165 ft	0 ft
Station 260 NB FM 1626	160 ft	87 ft
Station 260 SB FM 1626	172 ft	104 ft
Station 270 NB SH 45	183 ft	110 ft
Station 270 SB SH 45	183 ft	116 ft
Station 290 NB SH 45	154 ft	95 ft
Station 290 SB SH 45	126 ft	67 ft
Station 310 NB SH 45	162 ft	97 ft
Station 310 SB SH 45	144 ft	83 ft
Station 340 NB SH 45	170 ft	100 ft
Station 340 SB SH 45	148 ft	81 ft
Station 370 NB SH 45	129 ft	79 ft
Station 370 SB SH 45	169 ft	97 ft
Station 175 SB FM 1626	121 ft	70 ft
Station 175 NB FM 1626	142 ft	83 ft
Station 205 SB FM 1626	177 ft	97 ft
Station 205 NB FM 1626	126 ft	58 ft

Source: CP&Y, 2014c

Noise associated with the construction of the proposed project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. No extended disruption of normal activities would be expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

A copy of this traffic noise analysis would be made available to local officials to ensure, to the maximum extent possible, future developments are planned, designed and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), TxDOT is no longer responsible for providing noise abatement for new development adjacent to the proposed project.

Figure 3.5-2: Proposed Noise Contours (Map 1 of 6)

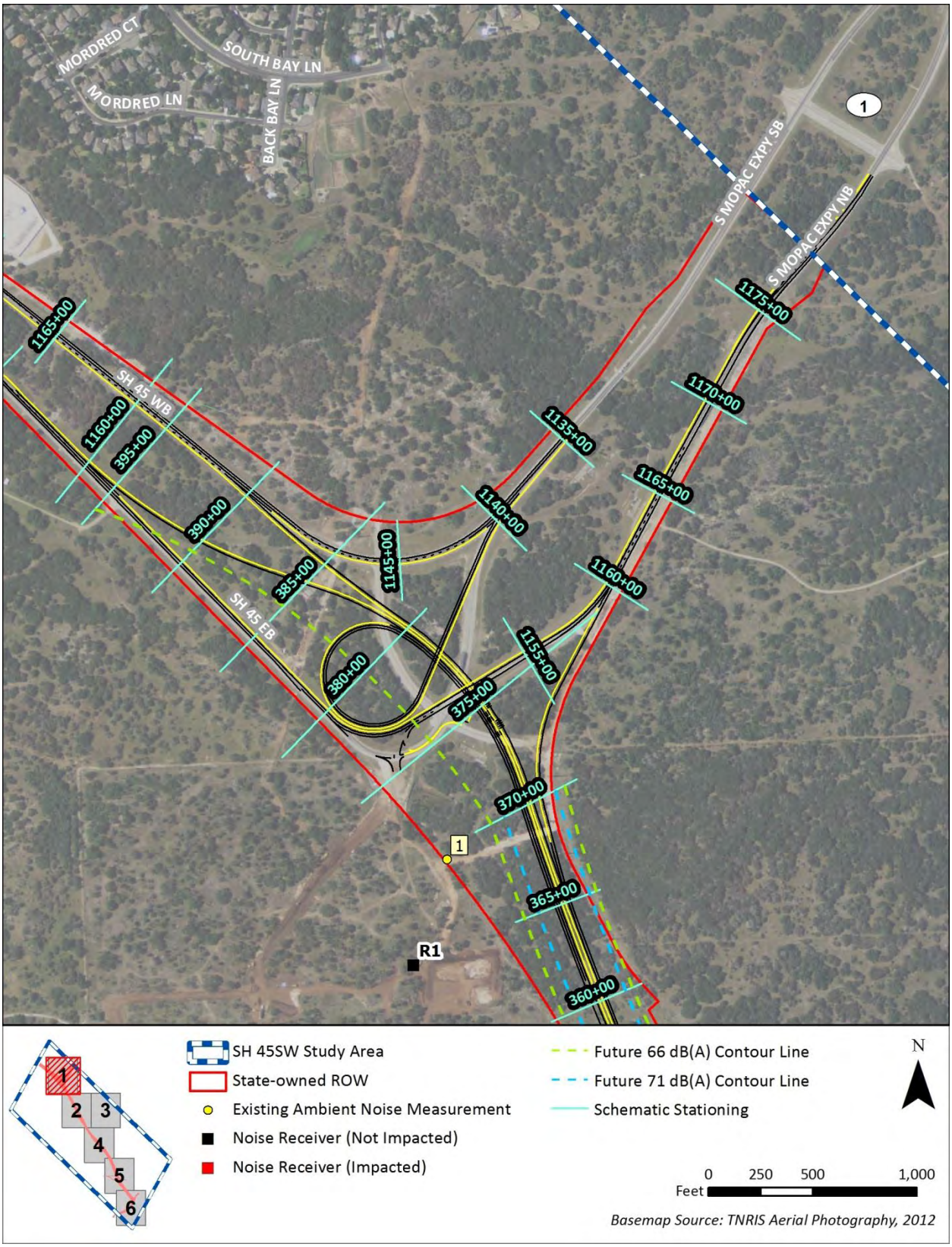

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Figure 3.5-3: Proposed Noise Contours (Map 2 of 6)

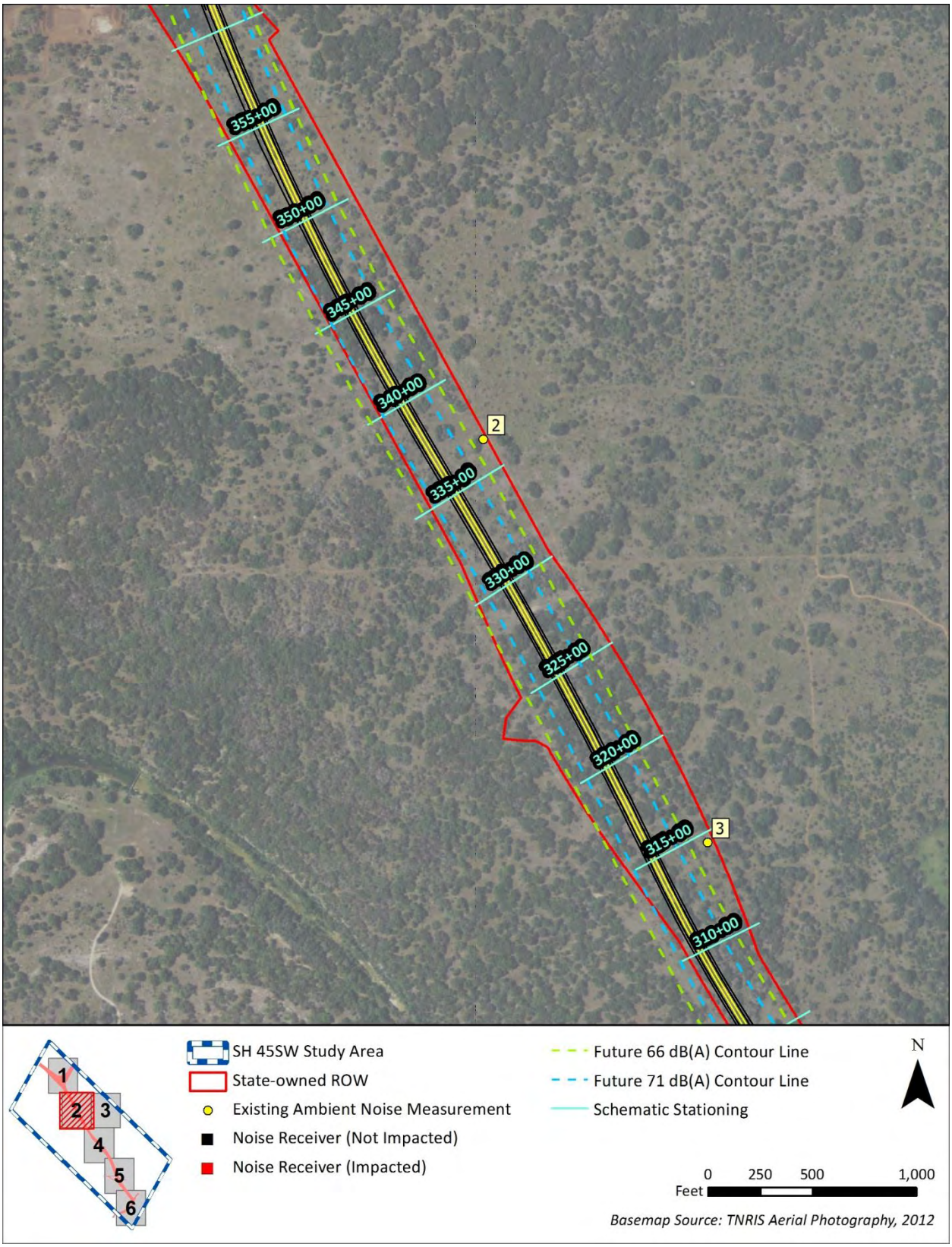

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Figure 3.5-4: Proposed Noise Contours (Map 3 of 6)

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Figure 3.5-5: Proposed Noise Contours (Map 4 of 6)

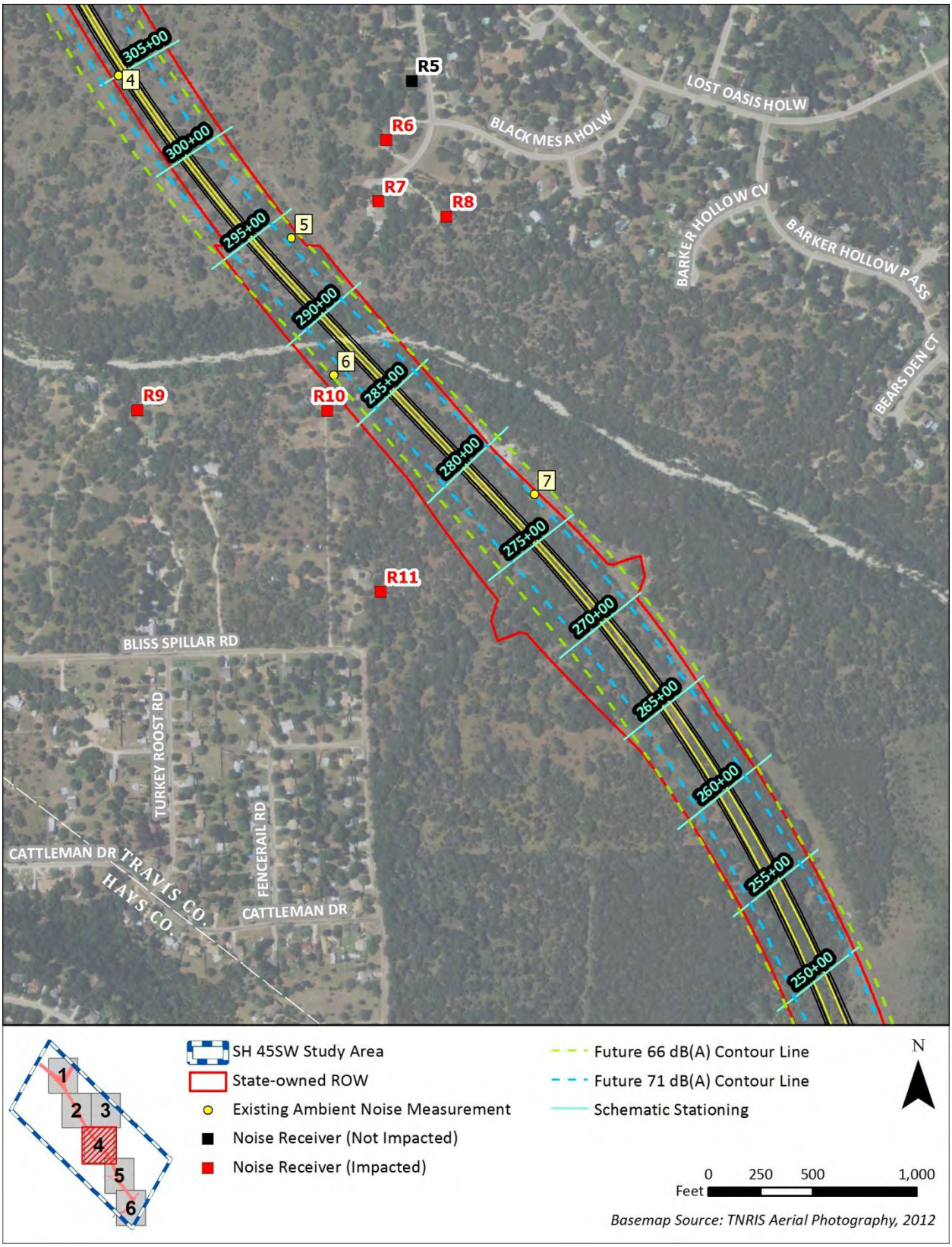

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Figure 3.5-6: Proposed Noise Contours (Map 5 of 6)

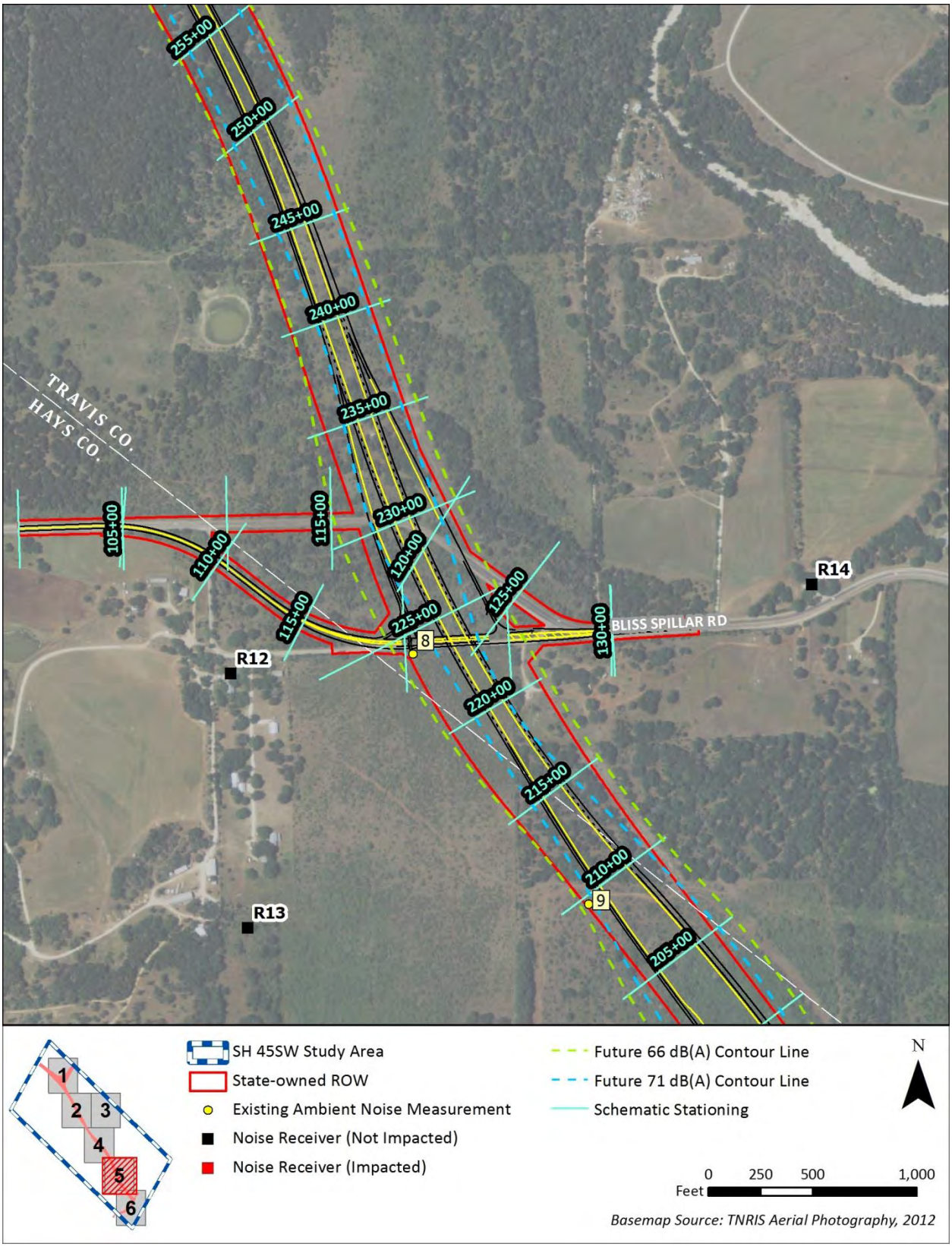

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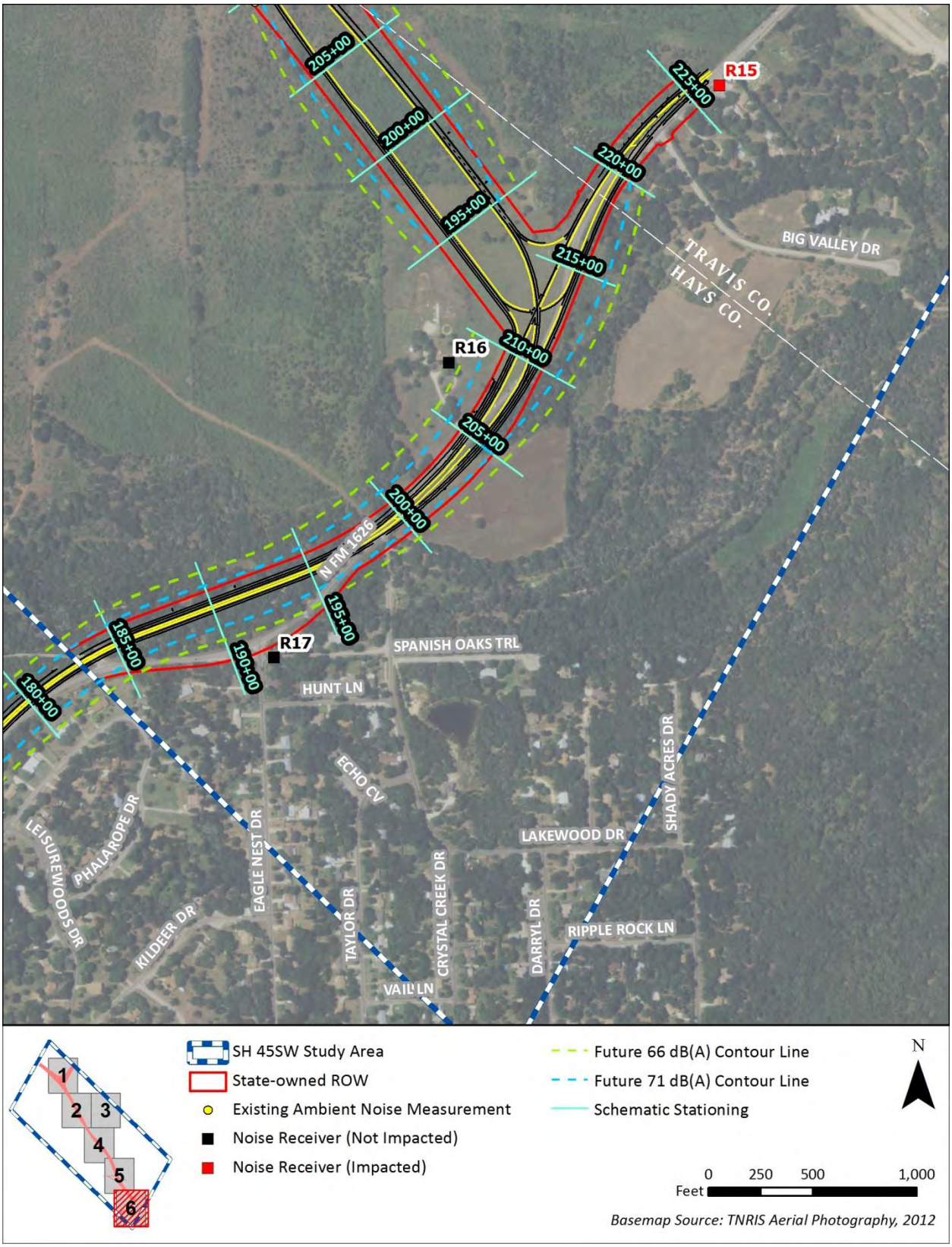
Figure 3.5-7: Proposed Noise Contours (Map 6 of 6)



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No Build Alternative

Under the No Build Alternative, no project-related noise impacts would occur.

3.5.3 Encroachment-Alteration Effects

No project-related encroachment-alteration noise impacts are anticipated as a result of the Build Alternative.

3.6 Edwards Aquifer / Groundwater Resources

The following sections describe the existing conditions regarding the Edwards Aquifer and groundwater resources.

3.6.1 Existing Conditions

Groundwater resources within the study area are the result of the area's geologic structure (see **Section 3.3.2**). Karst landscapes have unique hydrogeology that results in aquifers that are highly productive but vulnerable to contamination. One such aquifer is the Edwards Balcones Fault Zone Aquifer ("Edwards Aquifer"), which underlies the study area and much of central Texas.

The Edwards Aquifer extends from Bell County south to San Antonio and then west to Kinney County (BSEACD, 2010). The Edwards Aquifer is divided into three segments: the San Antonio segment, the Barton Springs segment, and the northern segment. The study area lies within the Barton Springs segment of the Edwards Aquifer, including portions of the Recharge and Transition Zones, as described below. The Barton Springs segment of the Edwards Aquifer extends from the groundwater divide north of Kyle, in Hays County, northward to the Colorado River, in Travis County, and the primary discharge point is Barton Springs (BSEACD, 2010; Smith, Hunt, and Schindel, 2005).

Five distinctive zones, including the Saline Zone and four freshwater zones, can be found in the Edwards Aquifer. The freshwater portion of the Edwards Aquifer includes four zones, as regulated by TCEQ (TCEQ, 2008a; TCEQ, 2013). These zones are the Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within Transition Zone. **Table 3.6-1** defines and describes these zones and provides the acreage of each zone that occurs within the study area.

Table 3.6-1: Edwards Aquifer Zones in SH 45SW Study Area

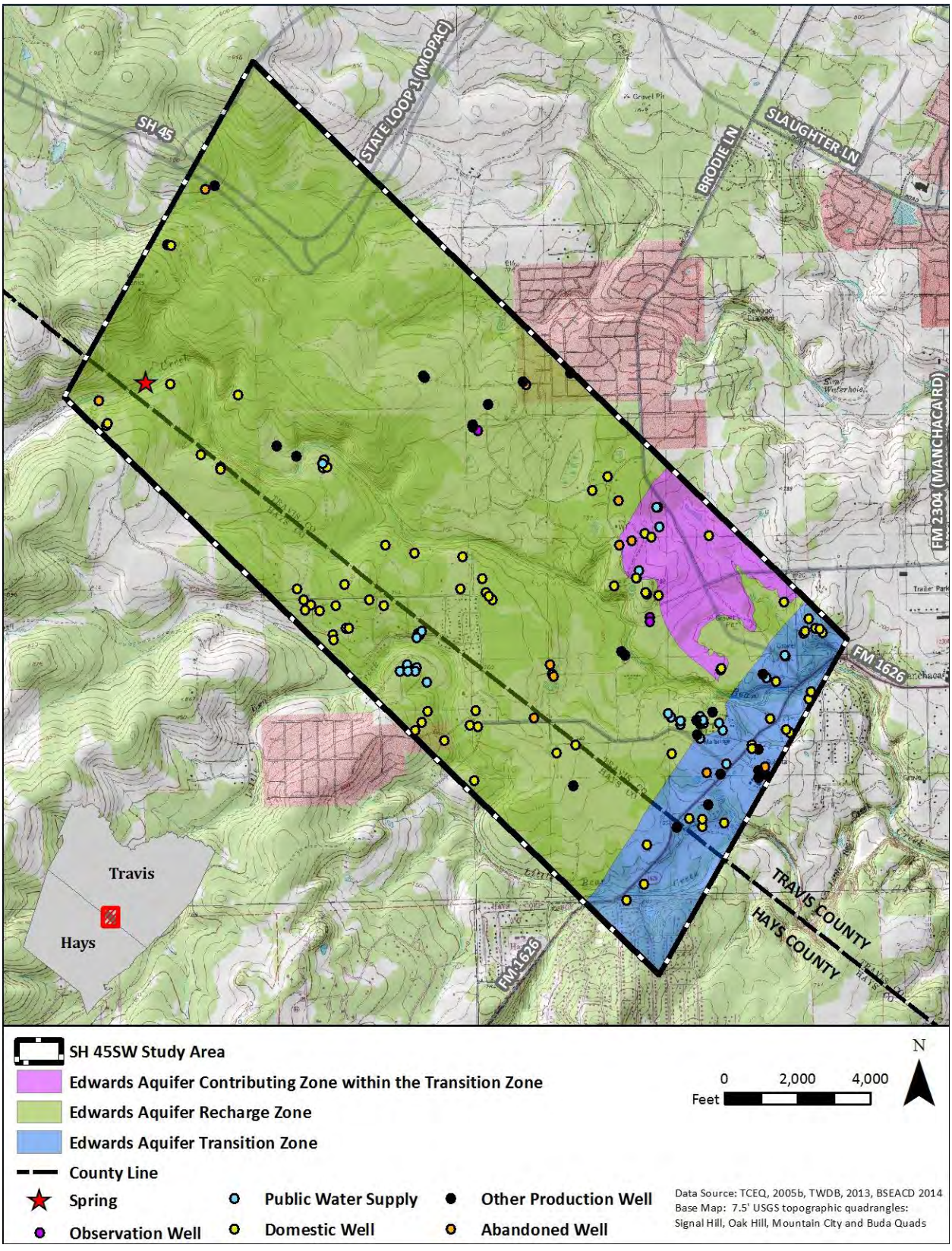
Edwards Aquifer Zone	Description	Acreage within SH 45SW Study Area
Contributing Zone	The Contributing Zone is composed of drainage areas and catchments of surface streams that feed runoff into rivers and streams that flow over the Recharge Zone.	0
Recharge Zone	The Recharge Zone, or area of groundwater replenishing, is the area where geologic layers of the aquifer are exposed at the surface. In this zone, caves, sinkholes, faults, fractures, and other permeable features create a potential for recharge of surface waters into the Edwards Aquifer. Water stored in the Recharge Zone as part of the Edwards Aquifer is unconfined.	4,513
Transition Zone	In the Transition (or "artesian") Zone, geologic features such as faults and fractures present possible avenues for recharge of surface water to the Edwards Aquifer. The Transition Zone includes a complex network of interconnecting spaces of varying sizes where water is forced to the surface and discharged through springs. A low-permeability confining unit overlies the Edwards Aquifer within the Transition Zone, becoming thicker from northwest to southeast.	533
Contributing Zone within Transition Zone	The Contributing Zone within the Transition Zone is composed of topographically high elevation areas within the Transition Zone where runoff drains to streams that flow over the Recharge Zone.	281
Saline Zone (outside potable zone of Edwards Aquifer)	The Saline Zone is an area of high salinity levels that does not contain potable water. The "bad-water line" delineating the Saline Zone is defined as the point at which total dissolved solids reaches 1,000 parts per million.	0

Source: Cederberg, Ging, and Ourso, 1998; TCEQ, 2008a; TCEQ, 2005b

Within the study area, the Recharge Zone is located primarily in the west, and the Transition Zone and Contributing Zone within Transition Zone are in the east (**Figure 3.6-1**) (TCEQ, 2005b).

Within the study area, runoff recharges to the Edwards Aquifer in the Recharge and Transition Zones, and groundwater in the Transition Zone generally flows from the southwest to the northeast (Garner and Young, 1976; Smith, Hunt, and Schindel, 2005; Smith, Veni, and Elliott, 2013). Groundwater flow follows a southwest to northeast trending fault associated with the Balcones Fault Zone that extends from Hays County northward into Travis County and roughly parallels IH 35.

Figure 3.6-1: Edwards Aquifer Zones within the Study Area



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Groundwater Recharge

The study area is located in a semi-arid environment with average annual rainfall of 32 inches (1981-2010 average; National Weather Service, 2013). Evaporation removes much of this water prior to recharging the aquifer, and the remaining water that originated as precipitation is divided between runoff and recharge to the aquifer (Woodruff, 1984; Slade, Dorsey, and Stewart, 1986). Water in stream channels may percolate through the stream substrate or flow through macropores associated with karst features, faults, and joints and recharge to the underlying aquifer (Woodruff, 1984; Slade, Dorsey, and Stewart, 1986). Multiple studies have tried to identify the proportion of recharge that occurs in creek beds and in upland areas. It has been estimated by Slade, Dorsey, and Stewart (1986) that approximately 85 percent of the water that recharges the Barton Springs segment enters the aquifer from the channels of six major creeks that cross the Recharge Zone. From north to south these creeks are Barton, Williamson, Slaughter, Bear, Little Bear, and Onion. The remaining 15 percent occurs as a result of infiltration from upland areas, including lesser drainages, probably some leakage from adjacent aquifers and, under extremely low flow conditions, influx from the San Antonio segment of the Edwards Aquifer (Smith and Hunt, 2004). Other studies found that upland recharge is a more important component of recharge to the Edwards Aquifer, and may be 26 percent of rainfall in upland areas (Hauwert, 2009; Hauwert and Sharp, 2014). Recharge in upland areas may occur at caves, sinkholes, faults, fractures, and other permeable features that allow water to percolate downward and enter the aquifer (TCEQ, 2008a; USDA, 1974; USDA, 1984). Water budget analysis reveals that recharge rates outside major stream beds reported by Hauwert and Sharp (2014) are too high (Slade, 2014). Based on Slade (2014), the long-term mean percentage of direct precipitation that actually contributes to recharge in upland areas and tributaries to the main channels is no more than 6.6 percent over the Recharge Zone.

Groundwater Discharge

Groundwater discharge from the Edwards Aquifer is primarily through springs or pumped wells. In the study area, there are 163 water wells; six of these are observation wells that are used to monitor water levels (TWDB, 2013; BSEACD, 2014a). The remaining 157 production water wells are used for a variety of purposes; the majority of the production water wells are used for domestic or public water supply uses (TWDB, 2013; BSEACD, 2014a). In addition, there is one spring located in the study area; this spring is located at Bear Creek upstream of the state-owned ROW (BSEACD, 2014a). **Figure 3.6-1** shows the locations of the water wells and the spring within the study area.

Several studies have been performed in the Barton Springs segment of the Edwards Aquifer to identify flow paths and flow rates in the aquifer. Three groundwater basins have been delineated, and in general most groundwater in the Barton Springs segment discharges at Barton Springs, located approximately nine miles northeast of the study area (BSEACD, 2010;

Smith, Hunt, and Schindel, 2005). The length of time it takes for recharged water to reach Barton Springs has been documented to vary from as little as two to three days to as long as three to four weeks, depending on flow conditions (BSEACD, 2003; Smith, Hunt, and Schindel, 2005).

Groundwater Quality

An early (1983) study of groundwater quality in Travis County found that groundwater was of overall good quality, but recommended establishing a network of water-quality observation wells (Brune and Duffin, 1983). Slade, Dorsey, and Stewart (1986) studied water quality in streams, wells, and springs in the Barton Springs segment and concluded that "the quality of water in the Edwards Aquifer is generally very good" and that "no regional contamination problems have been identified by this water-quality sampling program." This and subsequent studies analyzed a variety of constituents, including nutrients, physicochemical properties, indicator bacteria, major ions, trace elements, hydrocarbons, and pesticides. Some of these studies measure groundwater quality directly while others measure quality of water discharging at Barton Springs. As Barton Springs is the primary discharge point for this segment of the aquifer, studies of Barton Springs water quality are useful for understanding groundwater quality.

A study of data collected at Barton Springs between 1975 and 1999 found a statistically significant change in specific conductance, sulfate, turbidity, total organic carbon, and dissolved oxygen – all of which researchers linked to increased urbanization (Turner, 2000). However, it should be noted that significant trends were not observed in other constituents that are commonly considered pollutants, such as nutrients or TSS. A later study of water quality over time at Barton Springs and other related springs found similar trends of decreasing dissolved oxygen and increasing conductivity over time (Herrington and Hiers, 2010). This study also measured increases in nitrate concentrations; the trends related to dissolved oxygen and nitrates were of particular concern due to the potential for impacts on both the Barton Springs salamander and aesthetic impairments in the Barton Springs Pool (Herrington and Hiers, 2010).

In response to concerns following an *Austin American-Statesman* article about the quality of water at Barton Springs, COA closed the Barton Springs Pool and sought a health consultation from DHHS in 2003. DHHS evaluated twelve years of data collected by the US Geological Survey (USGS), COA, LCRA, and TCEQ, and assessed the public health risk associated with human exposure to 27 potential contaminants identified. DHHS concluded that there was no information to support the contention that swimming every day in Barton Springs Pool would result in adverse health effects and that swimming in Barton Springs Pool posed no apparent public health hazard (DHHS, 2003). A study conducted by TCEQ and EPA in the same year found that sediments from Barton Springs Pool were not toxic and that pollutants were present at levels typical of urban waterbodies (TCEQ, 2003).

Barton Springs Pool is often closed after storm events for maintenance and cleaning. Rainfall has been observed to influence both the quantity and quality of discharge at Barton Springs. A USGS study found that, under stormflow conditions, concentrations of nitrate and several major ions decreased, likely due to dilution of these constituents (Mahler et al., 2006). Concentrations of other constituents, including TSS, potassium, and herbicide and insecticide components, were found to increase following storm events (Mahler et al., 2006). During a wetter-than-normal period (September 2009-March 2010), increased levels of nitrogen and major ions and decreased densities of bacteria were observed in Barton Springs discharge (Mahler et al., 2011b). These values were correlated with conditions in recharging streams, demonstrating the influence of streamflow and climatic conditions on Barton Springs water quality.

During the early 2000s, anthropogenic contaminants, including atrazine (a herbicide), chloroform (a drinking-water disinfection by-product), and tetrachloroethene (a solvent), were recorded in low concentrations at Barton Springs (Mahler et al., 2006). Routine sampling also identified the frequent occurrence of three other herbicide compounds – DEA (an atrazine degradate), prometon, and simazine – and potassium (associated with fertilizer). However, routine sampling did not reveal insecticide or fungicide compounds. Trace metals (cadmium, chromium, copper, nickel, lead, zinc, and arsenic) associated with both human-derived and natural sources were also detected. All of these constituents were detected well below drinking water standards (Mahler et al., 2006). However, this study demonstrated the influence of water quality in recharging streams on water quality at Barton Springs, even during non-stormflow conditions.

More recent studies have characterized concentrations of nitrate and wastewater compounds in the Barton Springs segment and their potential relation to wastewater sources in the Contributing Zone. Nitrate concentrations in Barton Springs and the five streams that provide most of its recharge were much higher during 2008-2010 than before 2008 (1990 to 2008, USGS data) (Mahler et al., 2011a). Biogenic nitrogen (from human or animal waste, or both), septic systems, and land-applied treated wastewater effluent are likely sources contributing nitrate to the recharging streams (USGS, 2011). Elevated nitrate concentrations likely resulted in part from the transition from dry to wet conditions in fall 2009, but similar transitions also occurred during 1990-2008, indicating that increased nitrogen loading associated with population growth was likely also a contributing factor (Garner and Mahler, 2007; USGS, 2011). Excessive levels of nitrates and other wastewater compounds can cause algal blooms, which can decrease dissolved oxygen levels and threaten other aquatic species (USGS, 2011). As the population over the Barton Springs Contributing and Recharge Zones is projected to double between 2010 and 2035, the direct discharge of treated wastewater into Contributing Zone streams is anticipated (USGS, 2011). Currently, at least one permit has been issued for direct discharges of wastewater in the Bear Creek watershed (USGS, 2011).

Despite the overall good water quality of Barton Springs, the presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water detected by researchers over the past few decades signify potential effects of growing regional urbanization on aquifer water quality. Monitoring of water quality in the Barton Springs segment of the Edwards Aquifer is ongoing by the Barton Springs/Edwards Aquifer Conservation District (BSEACD), USGS, and COA. The established performance standard for permanent stormwater control measures in the TCEQ Edwards Aquifer Rules (see **Groundwater Regulations and Mitigation** below) is adequate to protect water quality at Barton Springs based on a recent evaluation of COA monitoring data (Herrington and Hiers, 2010) by Dr. Michael Barrett of the University of Texas at Austin Center for Research in Water Resources. Dr. Barrett concluded that stormwater controls have been effective in preventing degradation of water quality at Barton Springs from stormwater (Barrett, 2014). The potential for the proposed SH 45SW to affect water quality in the Barton Springs segment of the Edwards Aquifer is addressed in the following section and the potential for impacts to listed salamander species is addressed in **Section 3.8**.

3.6.2 Direct Effects

Build Alternative

Impacts to Groundwater

While the discussions below are focused on examination of the impact that construction and use of SH 45SW would have on groundwater quality, it is important to note that most of the vehicles expected to generate pollutants on SH 45SW would, in the future, still be traveling across the Recharge Zone on other roads in absence of SH 45SW (see discussion of traffic volumes expected under the No Build Scenario in **Section 3.2.3**). The effect that construction of SH 45SW would have on traffic patterns could prove beneficial to groundwater quality in the Edwards Aquifer. Currently, a high volume of traffic crosses the Edwards Aquifer Recharge Zone between the city of Austin and northern Hays County via FM 1626 and Brodie Lane. Brodie Lane is not equipped with the robust system of stormwater control BMPs that is proposed for use with SH 45SW. Construction of the proposed project is expected to reduce traffic volumes on Brodie Lane by shifting some of that traffic to SH 45SW. This would allow a greater percentage of the total pollutant load in runoff generated on the Recharge Zone through use of vehicles to receive treatment prior to discharge to pervious surfaces.

Within the state-owned ROW, approximately 278 acres lie over the Edwards Aquifer Recharge Zone and 33.6 acres lie over the Transition Zone. However, ground disturbance would occur on only 21.7 acres of state-owned ROW over the Transition Zone; work in the remaining 11.9 acres over the Transition Zone would be limited to restriping of existing pavement and, therefore, this area was not considered in the TSS calculations discussed below (see *Post-Construction Effects to Groundwater Quality* section). All 278 acres over the

Recharge Zone were considered in TSS calculations as ground disturbance would occur throughout this area. Possible effects to the Barton Springs segment of the Edwards Aquifer if adequate controls are not in place could include the following:

1. Short-term potential for TSS and other constituents in stormwater runoff from the construction site to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge;

2. Long-term potential for pollutants from the completed roadway, including TSS and other constituents in stormwater runoff and from substantial spills, to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; and

3. Potential for changes in the recharge rate to the Edwards Aquifer resulting from increases in impervious cover or sealing of sensitive features.

The following sections will address these concerns and demonstrate that the proposed project would result in a negligible impact to the Barton Springs segment of the Edwards Aquifer. Overall, the analyses indicate that the proposed project would have a negligible impact to recharge or spring flows because the increase in impervious cover is minor (48.1 acres over the Recharge Zone), and the proposed project would include BMPs that would collect and treat runoff prior to discharging it off-site. BMPs are those measures that are reasonable and necessary to protect groundwater and surface water quality and may include activities, prohibitions, practices, maintenance procedures, and other management practices (TCEQ, 2008b). Implementation of robust BMPs during construction and operation of SH 45SW, including erosion controls, sediment controls, and post-construction controls, would avoid or reduce impacts to water quality. Examples of structural BMPs that would be used during project construction include mulch logs, rock filter dams, silt fences, PFC pavement, VFS, grassy swales, and water quality ponds. Non-structural BMPs typically emphasize source control practices designed to minimize and/or prevent the accumulation of pollutants; examples of non-structural BMPs include native/xerophytic vegetation propagation, pesticide management, mowing schedule, and street sweeping. These BMPs are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**. Potential hazardous material containment would be addressed through the use of several BMPs, including the placement of water quality ponds designed to also serve as hazardous materials traps. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series, with each in the series removing additional TSS and other pollutants. These BMPs would remove at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone, as discussed in the **Groundwater Quality Protection Measures** section below. Stormwater runoff would also be treated by BMPs in the Transition Zone, although treatment over the Transition Zone is not required by TCEQ.

Construction Phase Effects to Groundwater Quality

The following information describes potential temporary impacts and how these impacts would be minimized during construction.

The major water quality issues associated with highway construction activities are the processes of erosion and sedimentation. Cleared areas and any other exposed ground are susceptible to erosion. Eroded sediment may then be redeposited; this sedimentation may occur on a variety of locations including on another upland site, in a water body, or in an aquifer recharge feature. Eroded sediment may contribute to elevated concentrations of certain constituents in stormwater runoff from the construction site. A study that monitored the water quality of Danz Creek during the construction of the existing SH 45 found increases in concentrations of TSS, volatile suspended solids (VSS), turbidity, iron, and zinc in stormwater runoff from upstream of the highway construction site to downstream of the construction site (Barrett et al., 1995d). The monitored construction site included typical BMPs such as silt fence and rock berms. The study also noted the transitory nature of the effects by indicating that the stream conditions downstream of the site returned to pre-construction conditions soon after construction was completed.

BMPs would be utilized to prevent, reduce, or capture and treat runoff from the proposed project site in order to minimize impacts to water quality from erosion and sedimentation. TxDOT and the Mobility Authority would utilize appropriate temporary, construction-phase BMPs to treat runoff from the proposed roadway and minimize impacts to water quality. These BMPs would provide for up-gradient overland flow prevention, slope stabilization, and on-site sediment retention. In addition, an Environmental Compliance Management Plan (ECMP) would be developed with water quality-specific guidelines and trained personnel to ensure its success. A notable aspect of the ECMP would be an on-site full-time environmental compliance manager who would oversee construction activities and perform inspections of BMPs. Specific plans regarding BMPs would be included in the WPAP that would be prepared for the proposed project (see **Groundwater Regulations and Mitigation** below). The WPAP would include discussion of temporary BMPs and measures, including appropriate control measures for each major activity associated with the proposed project and the general timing (or sequence) during the construction process that the measures would be implemented.

Potential construction-phase impacts to groundwater quality could also occur where drill shafts would be excavated to a depth of 25 to 35 feet. Measures to avoid impacts to groundwater quality and potential aquatic salamander habitat during drilling would include: 1) all equipment refueling and overnight storage would take place outside of the 100-year floodplain; 2) drill shaft tailings would be removed daily from the 100-year floodplain in order to avoid backfilling the shaft; 3) steel casing would be used for drill shaft construction**;** and 4) any voids encountered would be evaluated based on established criteria as outlined in **Appendix H:**

Water Quality and Aquatic Resource Protection Technical Report . Therefore, no impacts to groundwater quality associated with the proposed drill shafts are anticipated.

Post-construction Effects to Groundwater Quality

The following sections describe expected levels of contaminants found in stormwater generated by urban highways, the amount of impervious cover resulting from the proposed roadway, and the post-construction effects to groundwater quality based on water quality protection measures planned for this proposed project.

Contaminants in Urban Highway Stormwater Runoff

An important indicator of water quality in stormwater runoff is TSS concentration. Background levels of TSS in runoff from undeveloped areas have been shown to range from 64 mg/L, as measured in Danz Creek upstream of the existing SH 45 (see **Section 3.7** for location of Danz Creek), to 103.6 mg/L, as measured by COA for undeveloped watersheds in the Austin area (**Table 3.6-2**). The TCEQ Technical Guidance for complying with the Edwards Aquifer Rules uses a background concentration of 80 mg/L that was estimated by COA (TCEQ, 2005a). Based on a past study at Danz Creek along the existing SH 45 and a nationwide study, expected averages of TSS concentrations in highway runoff can vary from 109 mg/L to 142 mg/L (**Table 3.6-2**). Similar values would be expected for the proposed SH 45SW. It is worth noting that the TSS concentration of 109 mg/L, measured in Danz Creek downstream of the existing SH 45, is approximately five percent greater than the 103.6 mg/L TSS concentration for undeveloped watersheds measured by COA (Barrett et al., 1995d; COA, 2006). This indicates that the contribution of TSS in highway runoff to receiving streams may be relatively small. With the use of water quality treatment controls, TSS concentrations in roadway runoff from the proposed SH 45SW would be expected to be reduced to less than background levels. Specific plans for comprehensive water quality treatment controls associated with the proposed project are discussed in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***.

Table 3.6-2: Total Suspended Solids (TSS) Concentration Comparison

Background/Undeveloped TSS Concentrations (mg/L)			Highway Runoff TSS Concentrations (mg/L)	
Danz Creek at SH 45 (upstream) (Barrett et al., 1995d)	**Undeveloped or landscaped areas (used in TCEQ Technical Guidance) (TCEQ, 2005a)**	**Average of various undeveloped watersheds in Austin (COA, 2006)**	**Danz Creek at SH 45 (downstream) (Barrett et al., 1995d)**	**Nationwide study from urban highways (Driscoll, Shelley, and Strecker, 1990a)**
64	80	103.6	109	142

It is anticipated that stormwater runoff from the proposed SH 45SW would contain similar pollutants and concentrations to other highways in similar settings. In addition to TSS, highway runoff may contain constituents including metals, nutrients, bacteria, herbicides, and hydrocarbons such as fuel oils and gasoline (Barrett et al., 1995b; Driscoll, Shelley, and Strecker, 1990a; **Table 3.6-3**). To estimate the concentration of pollutants in highway runoff, FHWA conducted research on 31 sites in 11 states during the 1980s, the results of which are reported in a multi-volume final report (Driscoll, Shelley, and Strecker, 1990a, 1990b). This study measured the event median concentration for a variety of pollutants in runoff from urban highways (defined by Driscoll, Shelley, and Strecker [1990a] as those with an average daily traffic [ADT] in excess of 30,000 vpd), as provided in **Table 3.6-3**. A similar study was performed at a high traffic site in central Austin (MoPac at West 35th Street) in the 1990s (Barrett et al., 1995c); results from this study are also presented in **Table 3.6-3**. Under the Build Alternative, the proposed roadway is projected to have a traffic volume of approximately 34,000 vpd in 2035 and therefore would be expected to have pollutant concentrations similar to the examples listed in **Table 3.6-3** for the FHWA study and measurements at a high traffic site located in central Austin (Driscoll, Shelley, and Strecker, 1990a; Barrett et al., 1995c). The sources of pollutants in highway runoff include vehicles, maintenance activities, surrounding land uses, and the atmosphere; these sources are discussed in more detail in **Table 2.2-1** in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***.

Table 3.6-3: Example Pollutant Concentrations in Urban Highway Runoff

Pollutant	Median Concentration per Precipitation Event (mg/l)	
	Nationwide Study of Urban Highways[1]	High Traffic Site Located in Central Austin[2]
Total Suspended Solids (TSS)	142	131
Volatile Suspended Solids (VSS)	39	36
5-Day Biochemical Oxygen Demand	n/a	12.2
Chemical Oxygen Demand	114	126
Total Carbon	n/a	47
Dissolved Total Carbon	n/a	25
Total Organic Carbon	25	n/a
Nitrite and Nitrate	0.76	1.03[3]
Total Kjeldahl Nitrogen	1.83	n/a
Phosphate Phosphorus	0.40	n/a
Total Phosphorus	n/a	0.33
Oil and Grease	n/a	4.10
Copper	0.05	0.03
Iron	n/a	2.61
Lead[4]	0.40	0.05
Zinc	0.33	0.21

[1] Driscoll, Shelley, and Strecker (1990a); urban highways were defined as those with an ADT in excess of 30,000 vpd
[2] Barrett et al. (1995c); high traffic site on MoPac at West 35th Street
[3] Nitrate only
[4] The difference in concentrations of lead presented here is likely due to the elimination of lead in gasoline. Data were collected for the nationwide study by Driscoll, Shelley, and Strecker (1990a) between 1975 and 1985; data were collected in Austin between 1993 and 1995 for the study by Barrett et al. (1995c).

While the example pollutant data for similar projects in **Table 3.6-3** was based on the use of ADT values, the FHWA study found that ADT was not useful in refining estimates of pollutant levels in runoff (Driscoll, Shelley, and Strecker, 1990b). When the group of "urban highway" sites was considered, no strong and definitive relationships between ADT and pollutant levels were observed. Rather, the FHWA study identified a variety of factors that are involved in pollutant loadings from highway runoff. These factors, as presented by Driscoll, Shelley, and Strecker (1990b), include:

- Climate
    - Precipitation form, frequency, intensity, and duration

  - Surface wind speed and direction
  - Temperature
  - Atmospheric deposition and removals
- Highway site situations
  - Configuration (elevated, ground level, or depressed)
  - Pavement composition, quantity, and condition
  - Design, geometrics, and cross-sections
  - Vegetation types on ROW
  - Drainage features
- Operational situations
  - Traffic characteristics (density, speed, and braking)
  - Vehicle characteristics (type, emission, age, and maintenance)
  - Vehicular transported, generated, and deposited inputs
  - Maintenance practices (sweeping, mowing, weed control, and repair)
  - Institutional characteristics (litter laws, speed limit enforcement, and car emission regulations)
- Surrounding land use characteristics

While all of the above factors cannot be evaluated for the proposed project, some of these factors may be addressed. For example, the pavement type on much of the proposed project would be PFC pavement, which exhibits high removal rates for a variety of pollutants. The design of the proposed roadway would include multiple layers of BMPs used in series to treat highway runoff, as discussed under **Groundwater Quality Protection Measures** below and in **Section 3.7.3**. In addition, the surrounding land use, which has been found to be the most important general factor that influences the level of pollutant loads in highway runoff (Driscoll, Shelley, and Strecker, 1990b), includes over 1,000 acres of COA's WQPLs. The WQPLs are protected from development in perpetuity to maintain the quality and productivity of the Edwards Aquifer (see **Section 3.1**). These protected lands are not expected to significantly contribute to pollutants in stormwater runoff.

However, even these undeveloped lands generate TSS that recharges into the aquifer. COA estimates 80 mg/L of TSS is typically generated from undeveloped lands (TCEQ, 2005a).

Naturally occurring contaminants within the surrounding undeveloped landscape include organic loading and TSS generated from storm events that eventually recharge the aquifer. A study by COA that examined stormwater runoff quality in developed and undeveloped watersheds measured ten pollutants in both watersheds (COA, 2006). All ten pollutants were observed in runoff from the undeveloped watersheds, and six of these pollutants (including TSS and total organic carbon) were found at concentrations that were not significantly different from concentrations in runoff from developed watersheds. This study demonstrated that there are naturally occurring pollutants that may naturally recharge into the Edwards Aquifer through stormwater.

Pollutant concentrations in receiving waters are highly variable among studies. For water bodies that are the recipients of runoff contaminants, several factors determine the extent and importance of their effects. These include the size and type of the catchment area, the potential for dispersion, and the biological diversity of the aquatic ecosystem (Barrett et al., 1995a). In a study of Danz Creek water quality at the existing SH 45 crossing, stormwater runoff from the highway resulted in increases in suspended solids (TSS and VSS), oil and grease, and zinc (Barrett et al., 1995d). Although an increase was found, the resulting water quality was well within levels appropriate for aquatic life or at concentrations commonly reported for streams during elevated flows following storm events in undeveloped watersheds (Barrett et al., 1995d). The study found that elevated background concentrations of some constituents were attributed to surrounding land uses; for example, fecal bacteria was likely derived from livestock, pets, and wildlife in the watershed upstream of the highway crossing while nutrients (nitrate and phosphorus) in the creek may have been the result of fertilization of the golf course that is crossed by the highway (Barrett et al., 1995d).

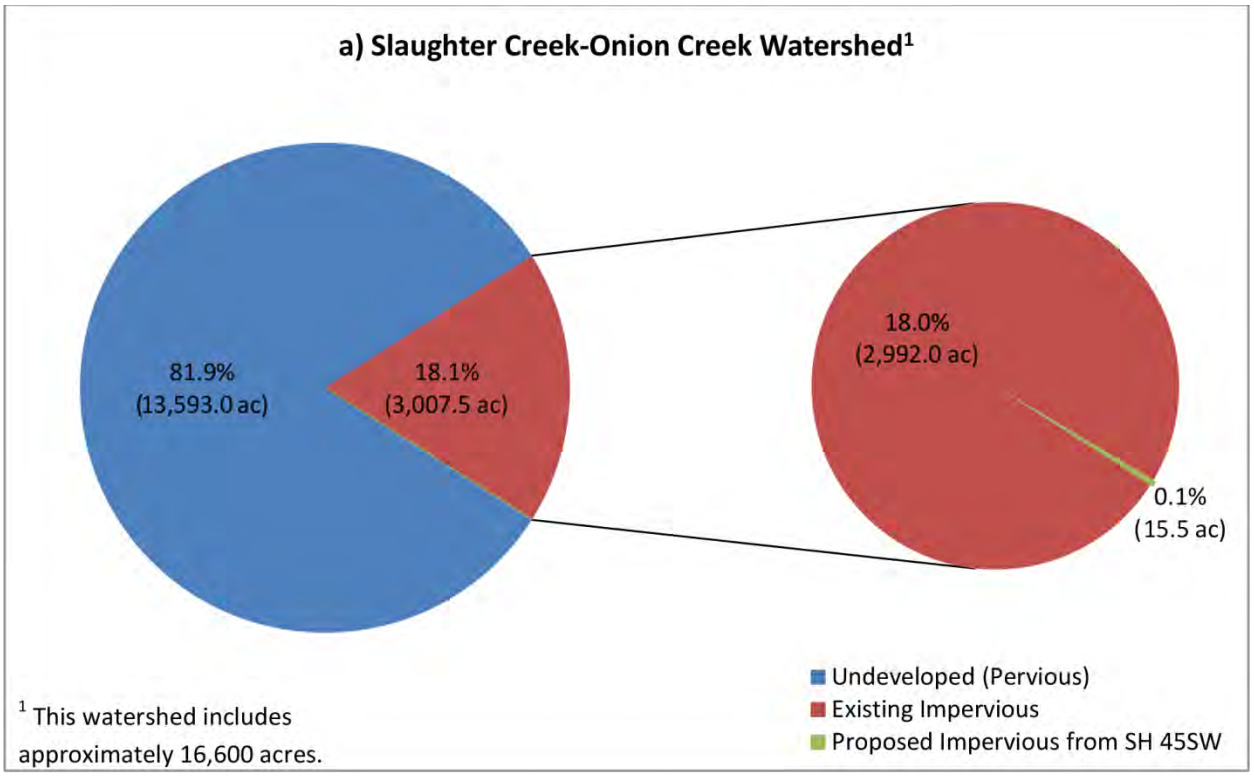
Impervious Cover Resulting from the Proposed Project

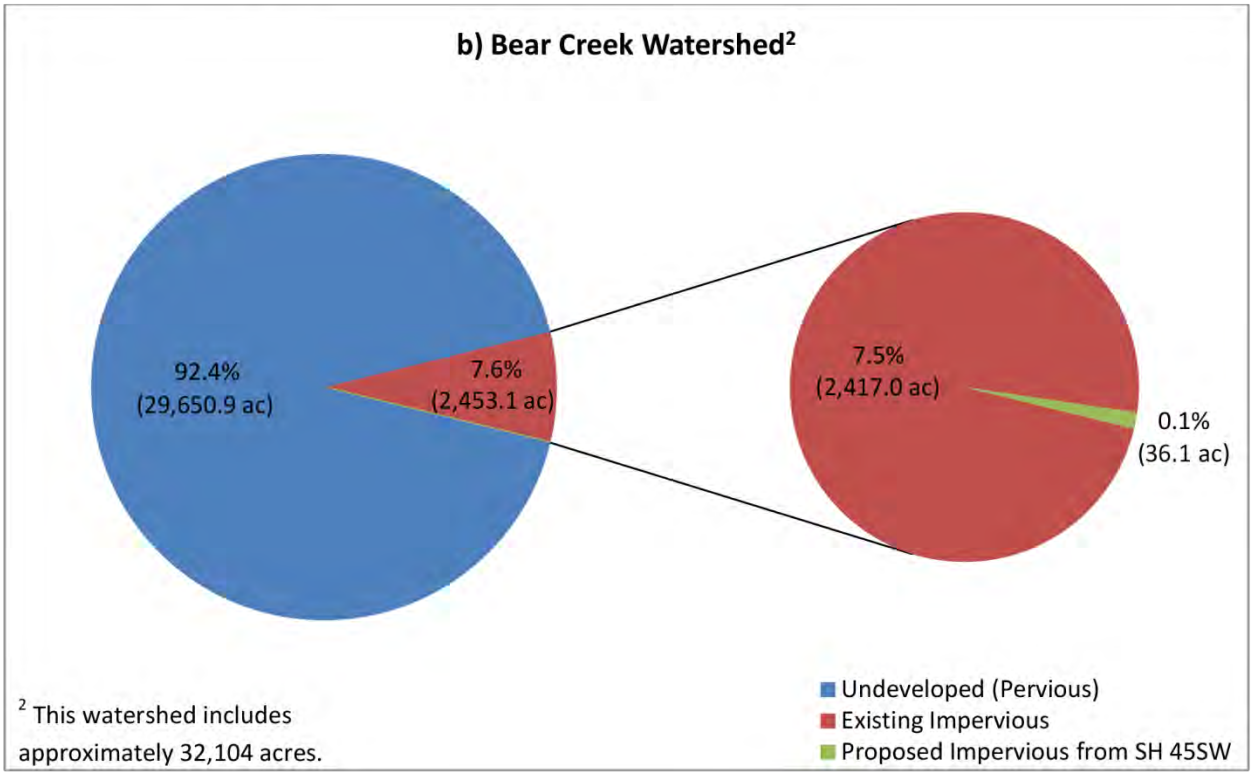
Implementation of the Build Alternative would add impervious cover to the state-owned ROW. The term “impervious cover” describes surfaces applied to the ground that are not penetrated by water, such as asphalt, concrete, and buildings. Increasing impervious cover reduces the area where water can soak into the ground and increases the area potentially exposed to contaminants. With the increased impervious surface, stormwater runoff volume and velocity would increase. The increased quantity and velocity of runoff may increase erosion and streambank destabilization, which in turn can lead to increased sediment loadings, channel widening, and detrimental changes in the morphology and aquatic ecology of the affected stream system (USFWS, 2010). Sediment can affect aquatic organisms in a number of ways. Sediments suspended in water can clog gill structures, which impairs breathing of aquatic organisms, and can reduce their ability to avoid predators or locate food sources due to decreased visibility (USFWS, 2010). The proposed project would address these issues through engineered BMPs that would control runoff quantity and velocity and remove at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone, as discussed in the **Groundwater Quality Protection Measures** below.

The proposed project would lie in two watersheds, the Slaughter Creek-Onion Creek watershed and the Bear Creek watershed (see **Section 3.7**). The Slaughter Creek-Onion Creek watershed is approximately 16,600 acres, of which approximately 2,992 acres (18.0 percent) are currently impervious (**Figure 3.6-2a**). The Bear Creek watershed is approximately 32,104 acres, of which approximately 2,417 acres (7.5 percent) are currently impervious (**Figure 3.6-2b**). The proposed project would increase impervious cover within the state-owned ROW by approximately 51.6 acres (approximately 16.6 percent of the 311.65-acre state-owned ROW); when combined with existing impervious cover, the proposed project would result in approximately 75.0 acres of impervious cover in the state-owned ROW (approximately 24.1 percent). While these values reflect an increased percentage of impervious cover in the state-owned ROW, a comparison of the impervious cover associated with the proposed project to the area of the watersheds the proposed project would cross indicates that the proposed project would result in a minor increase of impervious cover. The addition of the proposed project would add approximately 15.5 acres of impervious cover to the Slaughter Creek-Onion Creek watershed, or approximately 0.1 percent (**Figure 3.6-2a**). The construction of the proposed project would add approximately 36.1 acres of impervious cover to the Bear Creek watershed, or approximately 0.1 percent (**Figure 3.6-2b**). These values demonstrate that the proposed project would result in a minor increase of impervious cover. In addition, stormwater runoff from the proposed project would be treated by multiple layers of BMPs as described in the **Groundwater Quality Protection Measures** section below. Therefore, adverse effects on water quality at Barton Springs are not anticipated to occur as a result of the increase in impervious cover from the proposed project.

The most commonly reported impervious cover level at which noticeable degradation to aquatic ecosystems begins to occur is approximately ten percent of the watershed (USFWS, 2013). However, studies have found that levels of impervious cover below ten percent can result in degradation (Schueler, Fraley-McNeal, and Cappiella, 2009; Coles et al., 2012); therefore, no assumptions can be made with regard to a “safe zone” of impervious cover (USFWS, 2013). While the general percentage of impervious cover within a watershed can be helpful in estimating effects of urbanization on the watershed, a more thorough examination of where impervious cover occurs and what other threats to water quality are present is necessary to fully determine effects on aquatic ecosystems (USFWS, 2013). For example, non-point source runoff, highways and other sources of hazardous materials, livestock, and mining may all affect water quality.

Figure 3.6-2: Percent of Pervious and Impervious Cover by Watershed





Source: Blanton and RTG, 2014

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Groundwater Quality Protection Measures

TxDOT and the Mobility Authority are committed to implementing a variety of methods to reduce the risk of water quality degradation during construction and operation of the proposed SH 45SW. Phased construction would be considered and aimed at limiting the area of disturbance at any given time. Approximately 90 percent of the proposed roadway between FM 1626 and MoPac would be constructed on fill to limit natural ground disturbance, and the roadway footprint would be minimized. Approaches to water quality management during construction include early installation of permanent water quality features; prevention of natural drainage from outside the ROW from mixing with construction runoff prior to treatment; separating and treating construction runoff; and construction oversight by an independent, on-site environmental compliance manager. Operation and maintenance considerations include water quality treatment ponds/hazardous materials traps, and concepts from the Green Mobility Challenge such as PFC pavement, VFS, and grassy swales.[4] Planning for water quality treatment methods and approaches is ongoing through the SH 45SW Engineering Work Group, which includes representatives from BSEACD, the Mobility Authority, COA, Hays County, Travis County, and TxDOT. Specific methods and approaches to minimize water quality degradation are addressed in this section.

In accordance with the Edwards Aquifer Rules regulating construction over the Recharge Zone, permanent BMPs and measures must be designed, constructed, operated, and maintained to ensure that 80 percent of the incremental increase in the annual mass loading of TSS from the site caused by the proposed project would be removed. TSS loads calculated for the proposed project utilized the TCEQ guidance on complying with the Edwards Aquifer Rules (TCEQ, 2005a). Load calculations are based on the following equation:

$$L = A \times P \times Rv \times C \times 0.226$$

where:

L = annual pollutant load (pounds)

A = contributing drainage area (acres)

P = average annual precipitation (inches)

Rv = appropriate runoff coefficient

C = average TSS concentration (mg/L)

0.226 = units conversion factor

[4] The Green Mobility Challenge was a design competition to identify innovative ways to build, operate, and maintain future transportation projects, including SH 45SW, hosted by TxDOT and the Mobility Authority.

This equation was used to calculate the existing TSS load in the state-owned ROW and the proposed TSS load (Build Alternative before treatment). Calculations of both the existing and proposed TSS loads include the areas of existing impervious cover (at existing roadways) and existing pervious cover (i.e., undeveloped areas); the proposed TSS load calculation is based on the area of new impervious cover associated with the proposed project. When calculating TSS loads, the appropriate runoff coefficients (*Rv*) are 0.03 for landscaped or natural areas and 0.90 for impervious areas, as recommended in the TCEQ guidance (TCEQ, 2005a). The average TSS concentrations (*C*) as presented in the TCEQ guidance are 80 mg/L for undeveloped or landscaped areas and 170 mg/L for impervious areas; these values are based on COA monitoring data (TCEQ, 2005a).

Calculations of TSS load removed through treatment with water quality protection measures and BMPs were based on proposed BMP types and locations. On the majority of the new roadway, including at-grade construction, PFC pavement and water quality ponds would be used for a minimum of two levels of water quality treatment. In most areas, VFS would provide a third level of treatment. A portion of the design would also include grassy swales, which would provide an additional level of treatment. For the super-structure areas including bridges (where use of PFC pavement is not appropriate), stormwater runoff would drain through a collection system into water quality ponds for treatment. Ten new water quality ponds would be placed at strategic locations within the state-owned ROW; the six existing hazardous materials trap vertical sand filters at MoPac and SH 45 would remain (see **Figure 3.7-6** in **Section 3.7.3**). The approximate locations of these ponds as currently proposed would be as follows:

- Pond 1: Near the intersection with FM 1626
- Pond 2: Under the bridge on the north side of Bliss Spillar Road
- Ponds 3 and 4: Downstream of the culvert approximately 1,200 feet north of Bliss Spillar Road
- Pond 5: East of the proposed roadway and south of Bear Creek
- Pond 6: Under the bridge at the north side of Bear Creek
- Pond 7: Between the main lanes and SUP approximately 2,500 feet north of Bear Creek
- Pond 8: Downstream of the culvert approximately 2,600 feet south of the connection from SH 45SW to MoPac
- Pond 9: Under the connection from SH 45SW to MoPac
- Pond 10: Next to the exit lane from MoPac to SH 45SW
- Six existing hazardous materials traps and vertical sand filters at the existing MoPac and SH 45 facilities (one of which does not drain the project area)

Water quality ponds would be used to capture runoff and remove TSS and other pollutants. These ponds may include batch detention ponds, sand filter systems/sedimentation ponds, or bioretention ponds; descriptions of specific treatment options are provided in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**. Water

would be released from ponds in a slow release such that velocity would be controlled and erosion at the discharge site would be reduced. In this way, stormwater runoff velocities would be reduced prior to release to receiving waters, therefore reducing streambank erosion along receiving waters. Water quality ponds would also function as hazardous materials traps and contain potential hazardous materials in the event of a spill.

During operation and maintenance of the SH 45SW facility, these levels of treatment and BMPs would be used in a series, with each in the series removing additional TSS and other pollutants. The standard TSS removal efficiencies of selected TCEQ-approved BMPs are provided in **Table 3.6-4**. The efficiency of multiple BMP types used in a series increases the total TSS removal efficiency, although the efficiency of each subsequent control would be expected to be less since the sediment that is most easily removed is captured in the first control (i.e., less than the values presented in **Table 3.6-4**; TCEQ, 2005a). The TCEQ equation for total TSS removal efficiency of BMPs in series was used to determine total TSS load that would be removed by the proposed BMPs and accounted for up to three levels of treatment. Removal efficiencies of BMPs used in series are discussed in **Section 3.7.2**.

Table 3.6-4: TSS Removal Efficiencies of Selected BMPs

BMP	TSS Removal Efficiency (%)
PFC	90
Grassy Swales	70
Vegetative Filter Strips	85
Sand Filter Systems[1]	89
Batch Detention Ponds[1]	91
Bioretention Basins[1]	89

[1] *Examples of water quality pond types that may be utilized for the proposed project.*
Source: TCEQ (2005a), TCEQ (2012)

Calculated values of the existing TSS load (before treatment and after treatment), the TSS load generated by the proposed project (before treatment), and the TSS load removed through existing and proposed water quality treatment measures are provided in **Table 3.6-5**. These TSS loads over the Recharge Zone include existing TSS loads generated by undeveloped areas and portions of existing MoPac and SH 45 located within the state-owned ROW. Of the approximately 17.7 acres of existing impervious cover over the Recharge Zone, approximately 14.3 acres are part of the existing MoPac and SH 45 facilities. Runoff from these facilities is currently treated by vertical sand filters designed in the 1980s and constructed in the early 1990s that remove approximately 80 percent of TSS loads generated from the roadway. This reduces the existing TSS load over the Recharge Zone as a large amount of the TSS generated on the existing MoPac and SH 45 facilities is removed through existing BMPs (approximately 12,451 lbs/year). Over the Transition Zone, approximately 5.7 acres of existing impervious cover contribute TSS loads in addition to the existing TSS load generated by undeveloped areas. The proposed TSS loads in **Table 3.6-5** provide the estimated TSS loads

generated by the proposed project before and after application of water quality treatment measures and are based on the amount of impervious cover associated with the proposed project. The increase in impervious cover would be greater over the Recharge Zone (approximately 48.1 acres of new impervious cover) than the Transition Zone (approximately 3.5 acres of new impervious cover), accounting for the larger proposed TSS load over the Recharge Zone under the Build Alternative. However, the TSS load removed through treatment would also be greater over the Recharge Zone than over the Transition Zone for a number of reasons. The state-owned ROW in the Transition Zone, including existing FM 1626 ROW, is generally narrow and has limited space for water quality ponds, VFS, or grassy swales. PFC would be used in most areas but was not included in TSS calculations where steep cross slopes would occur. The TCEQ describes roadways with PFC pavement as having a typical cross slope of about two percent (TCEQ, 2012). The proposed project would have steep cross slopes (approximately five percent) due to existing conditions on FM 1626, which the proposed project has been designed to match. PFC pavement operates by allowing stormwater to drain into the permeable pavement layer and conveying stormwater along the boundary between the permeable pavement layer and the underlying impervious pavement (TCEQ, 2012). TSS and other pollutants are captured in the pore space, and stormwater is discharged at the edge of the roadway where it can be diverted to a treatment area. On a roadway with steep cross slopes, such as the proposed SH 45SW, it is anticipated that some water would run off the steep road surface as surface sheet flow rather than draining into the permeable pavement layer, thereby decreasing the overall TSS removal rate of PFC pavement in that area. While the proposed PFC pavement over the Transition Zone was not used to calculate treatment, it would provide some amount of TSS removal.

Table 3.6-5: Changes in TSS Load Resulting from the Proposed SH 45SW

	TSS Load (lbs/yr)		
	Recharge Zone	**Transition Zone**	**Total**
Existing Conditions			
TSS Load Generated Without Construction (Existing conditions before treatment)	24,071	6,562	30,633
TSS Load Removed through Existing BMPs	12,451	0	12,451
TSS Load Remaining	11,620	6,562	18,182
Proposed Conditions			
Incremental Increase in TSS Load Generated (Build Alternative before treatment)	52,432	3,801	56,233
Total TSS Load Generated (Build Alternative before treatment)	76,502	10,363	86,865

Table 3.6-5: Changes in TSS Load Resulting from the Proposed SH 45SW cont'd

	TSS Load (lbs/yr)		
	Recharge Zone	**Transition Zone**	**Total**
TSS Load Removed through Proposed BMPs	54,955	5,384[1]	60,339
Total TSS Load Removed through treatment (Existing and Proposed BMPs)	67,406	5,384[1]	72,790
TSS Load Remaining	9,096	4,979	14,075
TSS Load Change (Difference between Existing and Proposed TSS Load Remaining values)	-2,524	-1,583	-4,107
Removal Criteria			
Required TCEQ Criteria (80% of Incremental Increase)	41,946	3,041	44,987
90% of Incremental Increase	47,189	3,421	50,610

[1] *Note that PFC pavement was not used in treatment calculations over the Transition Zone due to steep cross slopes of the proposed roadway. However, the proposed PFC pavement over the Transition Zone would provide some amount of TSS removal*
Source: RTG (2014)

Based on the current design and as shown in **Table 3.6-5**, a total of approximately 86,865 lbs of TSS would be generated within the project area annually following construction, of which 30,633 lbs are generated under existing conditions before application of existing treatment (five vertical sand filters located within the limits of the project along the existing MoPac and SH 45 facilities; a sixth existing vertical sand filter within the limits of the project along the existing SH 45 facility does not drain the project area). Based on an assumed 80 percent treatment efficiency, these five existing ponds remove 12,451 lbs/year of TSS. When this TSS removal is factored into the natural background loads, the existing project generates 18,182 lbs/year of TSS (30,633 – 12,451 = 18,182). Of the 86,865 lbs/year of TSS that would be generated by the project, 56,233 lbs/year would be directly attributed to the incremental increase in impervious cover associated with the proposed project. Of those 56,233 lbs/year of TSS generated by the project, 52,432 lbs/year would be generated over the Recharge Zone. Based on the TCEQ's Edwards Aquifer Rules, TxDOT is responsible for an 80 percent reduction in the expected incremental increase in TSS annual load caused by its projects, not for reducing background loads.

Accordingly, the minimum TSS load required by the Edwards Aquifer Rules to be removed from the project area is 44,987 lbs/year of TSS (56,233 x 80 percent = 44,986; **Table 3.6-5**). The more stringent goal of TxDOT to achieve 90 percent removal of the incremental

increase in TSS load would require the removal of 50,610 lbs/year of TSS over the project area. The combined water quality treatment measures for SH 45SW as designed are expected to remove 72,790 lbs/year of TSS. However, these 72,790 lbs/year of TSS incorporates the existing 12,451 lbs/year currently being removed from the existing project by the five sand filtration systems. When these 12,451 lbs/year are factored out of the overall load removed, calculations indicate that 60,339 lbs/year would be removed by new BMPs only. This is approximately 107.3 percent of the amount of TSS for which the project would be responsible ([60,339 / 56,233] x 100 percent = 107.3 percent). Thus, with water quality treatment as proposed, the TSS load expected to leave the state-owned ROW would be approximately 14,075 lbs/year. This is 4,107 lbs/year less than the existing project load (18,182 – 14,075 = 4,107).

The TSS annual load numbers provided above are based on total project area. For just that segment of SH 45SW that would occur on the Recharge Zone, annual natural background load is 24,071 lbs/year, not taking into account existing treatment (**Table 3.6-5**). When the existing sand filtration ponds are accounted for, the existing project generates 11,620 lbs/year of TSS. TxDOT would be required to reduce TSS based on the expected additional increase of 52,432 lbs/year. Proposed water quality treatment measures as designed would remove approximately 54,955 lbs/year of TSS on the Recharge Zone. Thus, the proposed BMPs are expected to annually remove the full incremental increase in TSS load expected to be generated on the Recharge Zone, plus an additional 2,523 lbs/year generated by the existing facilities (i.e., approximately 104.8 percent of the incremental increase in TSS over the Recharge Zone would be removed).

Based on the net load calculated for the proposed project and rainfall data for the area (65.8 acres of existing and proposed impervious surface over the Recharge Zone and a 32 inch/year average rainfall), [(9,096 pounds (lbs) TSS/yr) / (175.5 acre-feet of rainfall/yr)], average TSS concentrations of stormwater runoff over the Recharge Zone from the proposed project would be approximately 19.1 mg/L (1 lb/acre-foot equals 0.368 mg/L). **Table 3.6-6** provides the estimated reduction in TSS concentration for SH 45SW after applying the engineered BMPs. **Table 3.6-6** also compares the estimated TSS concentration for SH 45SW to other studies and technical guidance.

Table 3.6-6: Total Suspended Solids (TSS) Concentration Comparison and Estimated SH 45SW TSS Concentration After Application of Water Quality Treatment Measures

Background/Undeveloped TSS Concentrations (mg/L)			Highway Runoff TSS Concentrations (mg/L)		Estimated TSS Concentrations over Recharge Zone for SH 45SW After Application of Water Quality Treatment Measures (mg/L)
Danz Creek at SH 45 (upstream) (Barrett et al., 1995d)	Undeveloped or landscaped areas (used in TCEQ Technical Guidance) (TCEQ, 2005a)	Average of various undeveloped watersheds in Austin (COA, 2006)	Danz Creek at SH 45 (downstream) (Barrett et al., 1995d)	Nationwide study of urban highways (Driscoll, Shelley, and Strecker, 1990a)	
64	80	103.6	109	142	19.1

The TSS removal rates presented in **Tables 3.6-5** and **3.6-6** would be accomplished through engineered water quality protection features that would be designed in accordance with the Edwards Aquifer Rules to offset the increase in impervious cover and any potential increase of roadway contaminants. The analysis indicates that the TSS load remaining after construction is less than what would occur if the proposed project were not built, both overall and within the Recharge Zone. Over the Recharge Zone, approximately 21.7 percent (100 percent - [9,096 / 11,620]; **Table 3.6-5**) of the existing baseline/No Build yearly TSS load would be reduced through treatment via BMPs. TSS loading levels would improve over this section of the aquifer under the Build Alternative.

There is no applicable regulatory requirement to demonstrate removal of constituents besides TSS; therefore, no specific performance goals are described for pollutants other than TSS. However, information is presented herein that explains what constituents in highway runoff would be expected to be removed by permanent water quality controls. Although BMPs and other water quality protection measures are designed to remove TSS from runoff to comply with the Edwards Aquifer Rules, these measures have also been found to remove additional pollutants from stormwater runoff. A number of studies have measured the removal rates of other pollutants from highway stormwater runoff in the Austin area. **Table 3.6-7** presents removal efficiencies from four studies (percent of pollutant removed from highway runoff) for four BMPs (PFC pavement, sand filter water quality pond, vegetative filter strip, grassy swale) that would be used to treat stormwater runoff from the proposed SH 45SW. These BMPs exhibit high removal rates of a variety of pollutants, including nutrients, oil and grease, and metals.

Table 3.6-7: Published Data Regarding Pollutant Removal Efficiencies of Water Quality Protection Measures

Pollutant	PFC Pavement Removal (%)[1]	Water Quality Pond Removal (%)[2]	Vegetative Filter Strip Removal (%)[3]	Grassy Swale Removal (%)[4]
Total Suspended Solids (TSS)	92	91	85	74
Volatile Suspended Solids (VSS)	n/a	92	n/a	72
Turbidity	n/a	n/a	78	n/a
5-Day Biochemical Oxygen Demand	n/a	30	n/a	46
Chemical Oxygen Demand	7	53	63	35
Total Carbon	n/a	n/a	53[5]	48
Dissolved Total Carbon	n/a	n/a	n/a	9
Nitrite and Nitrate	8	-75[6]	23	59
Total Phosphorus	51	61	34	31
Oil & Grease	n/a	n/a	n/a	88
Copper	51	42	n/a	49
Iron	n/a	n/a	75	79
Lead	91	82	17	35
Zinc	81	74	75	74

[1] *Stanard, Barrett, and Charbeneau (2008); comparison of conventional asphalt and PFC pavement at Site 1*
[2] *Barrett (2010); study evaluated sand filter systems, a type of water quality pond*
[3] *Walsh et al. (1997); Walnut Creek site*
[4] *Barrett et al. (1995c)*
[5] *Total Organic Carbon*
[6] *The increase in nitrite and nitrate concentration observed for sand filter water quality ponds was attributed to biochemical processes that turn organic nitrogen and ammonia into nitrite and nitrate during the dry period between storm events and to a pronounced first flush effect in sand filter discharge due to buildup of nitrite and nitrate (Barrett, 2010). This premise is supported by the fact that the study found a decrease in concentration of total Kjeldahl nitrogen, a measure of the sum of organic nitrogen, ammonia, and ammonium.*

In summary, the TSS analyses presented in **Tables 3.6-5** and **3.6-6** and published data regarding pollutant removal efficiencies of BMPs (**Table 3.6-7**) indicate that the proposed project would have a negligible impact on groundwater quality in the Barton Springs segment of the Edwards Aquifer. Engineered water quality protection features would be designed in accordance with the Edwards Aquifer Rules to offset the increase in impervious cover and any potential increase of roadway contaminants. These water quality protection measures and BMPs would remove at least 90 percent of the incremental increase in TSS load generated by

the increase in impervious cover over the Recharge Zone and would exceed the Edwards Aquifer Rules requirements. Therefore, the proposed project would comply with the Edwards Aquifer Rules and groundwater quality would not be degraded.

Groundwater Quantity

Groundwater quantity impacts within the aquifer occur for two reasons: 1) Changing output from the aquifer (e.g., groundwater withdrawal via wells); or 2) changing the input to the aquifer (e.g., aquifer recharge rate). The Build Alternative would result in temporary impacts to groundwater quantity during construction as changes in vegetation coverage, soil compaction, and soil roughness (a measure of how easily water will flow over ground) all change infiltration rates and flow dynamics. A decrease in soil roughness and an increase in soil compaction are common on construction sites where heavy machinery travels over the same areas repeatedly. Increased soil compaction leads to decreased infiltration and, therefore, increased volumes of stormwater runoff. Use of temporary BMPs during construction would minimize impacts to groundwater quantity as discussed in **Section 4.1** of **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report*.**

Existing roadways (e.g., MoPac, SH 45, Bliss Spillar Road, FM 1626) in the state-owned ROW represent approximately 23.4 acres of impervious cover, of which approximately 17.7 acres (75.6 percent) are located within the Recharge Zone. The existing impervious cover over the Recharge Zone is mainly located at the existing MoPac and SH 45 facilities (14.3 acres); the remaining 3.4 acres are at Bliss Spillar Road. Implementation of the Build Alternative would add a total of approximately 51.6 acres of impervious cover, of which approximately 48.1 acres (93.2 percent) would be added within the Recharge Zone and approximately 3.5 acres (6.8 percent) would be added within the Transition Zone. **Table 3.6-8** summarizes the changes in impervious cover resulting from the proposed project. The proposed impervious cover associated with the Build Alternative accounts for less than 0.2 percent of the Recharge and Transition Zones within the watersheds crossing the proposed project (Bear, Little Bear, and Slaughter Creeks) and less than 0.1 percent of the entire Recharge and Transition Zones of the Barton Springs segment of the Edwards Aquifer.

Table 3.6-8: Changes in Impervious Cover Resulting from the Proposed Project by Edwards Aquifer Zone

Area of Impervious Cover (acres)		
Recharge Zone	**Transition Zone**	**Total**
48.1	3.5	51.6

Source: Blanton and RTG, 2014

Although the proposed project would add new impervious cover over the Recharge Zone, as proposed, stormwater generated from the road would be treated through water quality ponds and then released over time (after any single event, the water would be retained for a

minimum of 12 hours and released over a 48-hour period) to recharge back into the aquifer. BMPs would be utilized to treat and then release stormwater runoff such that recharge would still occur. Some BMPs, such as VFS, grassy swales, and water quality ponds, allow for recharge by slowing runoff velocities, thereby increasing infiltration, in addition to removing TSS and other pollutants from runoff (see **Table 3.7-4**). During large storm events, in which much more runoff is produced than is recharged to the aquifer during high-flow periods (Slade, Dorsey, and Stewart, 1986), the retention of stormwater runoff and gradual release from water quality ponds may allow for greater recharge to the Edwards Aquifer. The proposed water quality ponds and other BMPs would function as dams that would impound stormwater runoff; this stored runoff would slowly be released to receiving waters following peak flows and would allow more runoff to recharge the Edwards Aquifer (Slade, Dorsey, and Stewart, 1986). Additionally, in accordance with the TCEQ's Edwards Aquifer Rules, BMPs would maintain flow to naturally occurring sensitive features to the extent practicable. In the vicinity of Flint Ridge Cave, BMPs would be placed such that the amount of water draining to Flint Ridge Cave would be maintained (see **Flint Ridge Cave** subsection). Examples of BMPs that could be used during project construction are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**.

Recharge and Discharge Features in the Edwards Aquifer

Recharge to the Edwards Aquifer

The Edwards Aquifer has porosity and permeability that allow water to enter and travel through the limestone matrix. Most recharge to the aquifer occurs through karst features including fractures, caves and sinkholes; these features can rapidly provide large volumes of water to the aquifer and therefore are sensitive to potential contamination that can ultimately impact the quality of groundwater in the aquifer (Mahler et al., 2006; Slade, Dorsey, and Stewart, 1986). However, recharge to the aquifer occurs both as direct infiltration into karst features and as diffuse infiltration into the rock matrix (Mahler et al., 2006; Slade, Dorsey, and Stewart, 1986). Notable sensitive features in the Barton Springs segment of the Edwards Aquifer include recharge along streambeds (including Bear Creek in the study area) and discrete recharge through a variety of caves, pits, and sinkholes (BSEACD, 2003; Slade, Dorsey, and Stewart, 1986). No open-mouthed recharge features are present in the Bear Creek channel within the state-owned ROW (**Appendix M: Biological Evaluation and Technical Reports**), but recharge to the aquifer undoubtedly occurs in the Bear Creek channel within the state-owned ROW through fractures and fissures.

Portions of outcrop areas that exhibit more porosity and permeability are inherently more vulnerable to receiving pollutants. Karst features allow for rapid water movement and potential point contamination of the underlying aquifer. Karst features in the state-owned ROW and potential impacts to those features are discussed in **Section 3.3** and in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological**

Evaluation and Technical Reports). The TCEQ Edwards Aquifer Rules state that, to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in the Geologic Assessment and that the permanent sealing of, or diversion of, flow from a naturally occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure should be avoided. The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of sensitive karst features. As discussed in **Appendix M: Biological Evaluation and Technical Reports**, the surface drainage basins of three sensitive features (F-55, F-23 [Hat Sink], and Flint Ridge Cave) would be directly impacted by the proposed roadway. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features. The proposed project would not impact the openings, surface expressions, or surface drainage basins of the fifteen remaining sensitive features.

Flint Ridge Cave

Flint Ridge Cave is a sensitive recharge feature that has its surface opening located approximately 150 feet outside and east of the state-owned ROW (Feature 2732 on **Figure 3.3-3**); however, a portion of the drainage area of the cave is within the state-owned ROW. Encroachment of impervious roadway cover on the drainage basin associated with Flint Ridge Cave could result in a decrease in water volume, resulting in potential drying of the cave environment and impacts to troglobites or aquifer-dependent species, as well as in a loss of recharge to the underlying Edwards Aquifer.

The Build Alternative would be located near Flint Ridge Cave and would result in approximately 1.3 percent (approximately 0.7 acre out of approximately 55.5 acres) of the surface catchment basin being covered by impervious surfaces (see **Figure 3.7-7** in **Section 3.7**). However, with the proposed design, no runoff from disturbed areas or the proposed roadway would enter the cave. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom on the rail. These inlets would be connected to accompanying stormwater infrastructure that would convey roadway runoff to a water quality pond situated outside the Flint Ridge Cave surface catchment basin, where the water would be treated and then discharged to Bear Creek. No untreated runoff associated with the roadway would enter Flint Ridge Cave or its surface watershed. In addition, to mitigate for the portion of the catchment basin of Flint Ridge Cave being removed by the Build Alternative, drainage to Flint Ridge Cave would be maintained by re-routing an equivalent acreage of natural runoff into the cave's surface drainage area. This natural runoff would not be allowed to comingle with roadway runoff. The size of the Flint Ridge Cave watershed would be maintained. Additional information regarding water quality protection measures in the vicinity of Flint Ridge Cave is provided in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**.

Flowpaths in the Edwards Aquifer

As discussed above, studies in the Barton Springs segment of the Edwards Aquifer have identified general flow paths in the aquifer. Dye tracing studies have indicated that water recharging in the study area appears to follow the Manchaca flow route to arrive at Barton Springs (BSEACD 2003; Hauwert, 2012). One study was conducted by COA to determine flow paths and rates of flow from the proposed project (Hauwert, 2012). This study injected dyes in three upland caves and within the channel of Bear Creek, and recovered the dyes at Barton Springs within two to four days. The discrepancies in groundwater flow rates among various studies can be attributed to a number of factors, including proximity and connection of the injection site to major preferential groundwater flow routes and hydrologic conditions during and after a dye injection. Dye recovery peaks associated with rain events have been observed, indicating that dye may be stored in the vadose (unsaturated) zone until sufficient rain events occur and carry the dye to the water table (Hauwert, 2012). Additionally, groundwater flow conditions may vary; under high flow conditions at Barton Springs, groundwater may travel as much as ten times faster across the aquifer than under low flow conditions (BSEACD, 2003).

Discharges from the Edwards Aquifer

Springs

The Barton Springs segment of the Edwards Aquifer discharges at a number of springs, including one spring located in the study area on Bear Creek upstream of the state-owned ROW (BSEACD, 2014a). No springs were observed in the state-owned ROW during field surveys. The most well-known outlet of the Barton Springs segment of the Edwards Aquifer is Barton Springs. The environment near the springs provides habitat for two federally listed species (Barton Springs salamander and Austin blind salamander; see **Section 3.8**). Barton Springs is located approximately nine miles north of the study area. If pollutants entered the Edwards Aquifer in the Recharge Zone within the ROW, the flow direction would likely take the pollutants toward Barton Springs. Because of the engineered BMPs that would remove at least 90 percent of the incremental increase in TSS load generated by the proposed project over the Recharge Zone and the relatively small amount of stormwater that would recharge from the proposed project area to the Edwards Aquifer (compared to the total water storage in the aquifer and daily discharge amount at the Barton Springs complex), no adverse impact to springs would be expected as a result of the proposed project. In fact, TSS load from the proposed project would be less than existing conditions (see **Table 3.6-5**), resulting in lower volumes of TSS recharging into the aquifer and potentially discharging at springs. In addition, no negative impacts to spring flow rates are anticipated as runoff from the proposed project would be treated through water quality ponds and then released over time (after any single event, the water would be retained for a minimum of 12 hours and released over a 48-hour period) to recharge back into the aquifer (see **Groundwater Quantity** above).

Wells

Groundwater Quantity

Approximately 8,733 acre-feet of water per year is extracted from water wells in the Barton Springs segment of the Edwards Aquifer through pumping authorized by the BSEACD or exempt from authorization (BSEACD, 2014b). This pumping accounts for approximately 2.9 percent of the volume of stored water in the aquifer, as shown in **Table 3.6-9**. As runoff from the proposed project would be treated through water quality ponds and then released over time (after any single event, the water would be retained for a minimum of 12 hours and released over a 48-hour period) to recharge back into the aquifer (see **Groundwater Quantity** above), no impacts to the availability of water in water wells or other hydrologic features in the study area are anticipated.

Table 3.6-9: Estimate of Storage Volume Loss Due to BSEACD-Authorized Pumping at Wells

Estimate of Volume of Water Removed from Aquifer Storage Annually (acre-feet)	Estimated Total Water Stored in Aquifer (acre-feet)[1]	Estimated Maximum Water Storage Lost Annually (%)
8,733[2]	306,000	2.9%

[1] *Slade, Dorsey, and Stewart (1986)*
[2] *BSEACD (2014b)*

Groundwater Quality

Quality of groundwater extracted from water wells would not be impacted by the proposed SH 45SW under the Build Alternative. As described above (see **Groundwater Quality Protection Measures**), the water that would runoff the proposed SH 45SW and recharge to the Barton Springs segment of the Edwards Aquifer would be treated by BMPs used in a series, with each in the series removing additional TSS and other pollutants. Examples of these BMPs include PFC pavement, water quality ponds, VFS, and grassy swales. TSS removal rates through these BMPs used in a series would be at least 90 percent of the TSS load generated by the increase in impervious cover over the Recharge Zone.

Several program areas help protect groundwater quality for public drinking water systems. TCEQ's Source Water Protection Program (SWPP) was created by the 1996 Amendments to the Safe Drinking Water Act and is the centerpiece of the Act's prevention focus. The program sets into motion a process by which local governments and suppliers of drinking water are encouraged to take proactive steps to protect local drinking water supplies before costly treatment enhancements are required. COA and BSEACD have also implemented programs and BMPs to protect water quality throughout the region.

Potential hazardous material containment would be addressed through the use of several BMPs. Hazardous material traps would be incorporated into the function of proposed

water quality ponds. Implementation of robust BMPs during construction and operation of SH 45SW, including erosion controls, sedimentation controls, and post-construction TSS controls, would avoid or reduce impacts to water quality. Examples of structural BMPs that would be used during project construction include mulch logs, rock filter dams, silt fences, PFC pavement, VFS, grassy swales, and water quality ponds. Non-structural BMPs typically emphasize source control practices designed to minimize and/or prevent the accumulation of pollutants; examples of non-structural BMPs include native/xerophytic vegetation propagation, pesticide management, mowing schedule, and street sweeping. These BMPs are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H.** During operation and maintenance of the SH 45SW facility, BMPs would be used in a series with each in the series removing additional TSS and other pollutants. TSS removal rates through these BMPs would be at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone. In addition, any construction would comply with applicable regulations, including the TCEQ Edwards Aquifer Rules (see **Groundwater Regulations and Mitigation** section).

Groundwater Regulations and Mitigation

Within the proposed project area, TCEQ and BSEACD have regulatory authority over the Edwards Aquifer and enforce protective measures that may affect the construction and operation of the proposed project. The following paragraphs discuss the regulations in more detail.

TCEQ regulates development within the Edwards Aquifer Contributing Zone and the Edwards Aquifer Recharge Zone in accordance with 30 TAC 213, commonly referred to as the Edwards Aquifer Rules. The Edwards Aquifer Rules are intended to protect Edwards Aquifer groundwater quality. The Edwards Aquifer Rules require the use of temporary and permanent BMPs for treatment of stormwater runoff from areas of impervious cover. The Edwards Aquifer Rules have specific standards that must be achieved to treat stormwater runoff. For example, temporary BMPs must include stabilization and structural practices. Permanent BMPs and measures must ensure that 80 percent of the incremental increase in TSS due to the regulated activity is removed for construction projects over the Recharge Zone (TCEQ, 2008b). Through the use of BMPs in a series, TSS removal rates for the proposed project would be at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone. Stormwater runoff would also be treated by BMPs over the Transition Zone, although this is not required by TCEQ. The Edwards Aquifer Rules also require that, to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features and that the permanent sealing of, or diversion of, flow from a naturally occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure should be avoided. TCEQ enforces the Edwards Aquifer Rules by requiring the submittal and approval of Contributing Zone Plans (CZPs) and WPAPs before initiation of a regulated activity. A WPAP would be prepared for the proposed project. The Edwards Aquifer

Rules require that TCEQ provide copies of the WPAP to affected cities, counties, and groundwater conservation districts. These entities and the general public may review and comment on the WPAP application when it is filed, thus there would be a public participation opportunity at that time (30 TAC 213.4 (a) (2)).

In 1987, BSEACD was established as a groundwater conservation district for the Barton Springs segment of the Edwards Aquifer (BSEACD, 2010). BSEACD was created with the directive to conserve, protect, and enhance the groundwater resources in its jurisdictional area. The jurisdictional area of BSEACD includes the Recharge and Transition Zones of the Barton Springs segment of the Edwards Aquifer, as well as additional area east of the Transition Zone in Travis, Hays, and Caldwell counties. BSEACD regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2010). The drought management program allows BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevation at an observation well.

Because a portion of the Barton Springs segment of the Edwards Aquifer is designated a Sole Source Aquifer, the EPA may evaluate any proposed projects within the designated project review area that are supported by federal financial assistance. As the proposed project is entirely state-funded, review by the EPA is not required.

No Build Alternative

Under the No Build Alternative, no project-related impacts to the Edwards Aquifer/groundwater resources would occur in the study area. Stormwater runoff from the undeveloped ROW would continue to exhibit background/undeveloped TSS concentrations (see **Table 3.6-2**) as the proposed roadway would not be constructed. No impacts would occur to sensitive karst features in the state-owned ROW or their surface drainage basins.

3.6.3 Encroachment-Alteration Effects

Encroachment-alteration effects to groundwater quality occur primarily due to increased impervious surface area which could result in increased runoff, alter recharge (flow and quality) into the aquifer, and decrease water quality downstream. Impervious cover would increase directly by the addition of the roadway and its associated infrastructure, and may increase due to induced changes that result from the proposed project. Effects would also occur in areas where vegetation in the proposed project area is cleared during construction, which could accelerate off-site erosion due to runoff. Placement of the roadway could encroach on the surface or subsurface drainage areas of adjacent caves/sensitive features, altering the hydrologic regime in those features.

3.7 Surface Water Resources

3.7.1 Existing Conditions

The following sections describe surface water resources within the SH 45SW study area. Surface water resources are closely connected to groundwater quality and quantity within the study area, as rainfall recharges the Edwards Aquifer through numerous pathways, particularly via recharge features/caves and creek flow. Surface water quality is likewise an important component of the health of surface and subsurface aquatic resources, including local springs. This section includes a discussion of local watersheds, floodplains, and waters of the U.S., including a summary of potential impacts and regulatory compliance issues. A more detailed discussion of potential water quality impacts and proposed measures to protect water quality is included in ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H**).

Jurisdictional Waters of the United States

The EPA and the USACE are charged with the protection of "waters of the U.S." under the Federal Water Pollution Control Act of 1972, amended in 1977 to the Clean Water Act (CWA). The term "waters of the U.S.," as defined in 33 Code of Federal Regulations (CFR) 328.3, denotes: all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters including wetlands; and all other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce.

To characterize surface drainage systems (streams), the designations *perennial*, *intermittent*, and *ephemeral* are used:

- *Perennial streams* flow year-round during a typical year. The water table is located above the stream bed for most of the year and groundwater is a primary source for stream flow. A perennial stream is typically capable of supporting aquatic life.
- *Intermittent streams* flow during certain parts of the year, typically seasonally, when groundwater provides water for stream flow. Rainfall is a supplemental source of flow, and during dry periods intermittent streams may not have flowing water. Biological constituents are adapted to wet and dry fluctuations.

- *Ephemeral streams* only flow for short durations after precipitation events. Ephemeral stream beds are located above the water table year round, and runoff from rainfall is the primary source of flow. Aquatic life is extremely scarce or typically absent. Many ephemeral streams are not USACE-regulated waters; in order to be considered jurisdictional, ephemeral streams must have a surface connection to jurisdictional waters and exhibit an ordinary high water mark (OHWM).

All tidal waters, interstate waters, and intrastate waters whose use, designation, or destruction could affect interstate commerce are considered jurisdictional and subject to USACE regulation. In practical application, this includes all perennial and intermittent streams and all ephemeral streams exhibiting an OHWM. Also included are natural lakes and ponds with surface connections to navigable water or other ties to interstate commerce, all impounded lakes or ponds created from jurisdictional waters described above, and their adjacent wetlands.

Waters of the U.S. present in the state-owned ROW include Danz Creek, Danz Creek Split, Bear Creek, and Little Bear Creek. One additional feature, an isolated livestock pond, extends into the western portion of the state-owned ROW but is not expected to be considered a water of the U.S. by the USACE because it is not connected to a USACE jurisdictional stream. No wetlands were observed in the state-owned ROW during field investigations. Descriptions of the water bodies in the two watersheds within the study area, Bear Creek and Slaughter Creek-Onion Creek, are provided below.

Watersheds

A watershed is an area that includes a stream or river and all the land that drains into it. The Colorado River watershed stretches across Texas and a portion of eastern New Mexico, from Cochran, Yoakum, and Gaines counties in the northwest to Brazoria, Matagorda, and Calhoun counties where the Colorado River drains into the Gulf of Mexico (LCRA, 2013b). The study area for SH 45SW falls within the Austin Basin of the Colorado River watershed. Water bodies (and their associated floodplains) that occur in the study area include Danz Creek, Danz Creek Split, Bear Creek and Little Bear Creek. In addition, tributaries to Bear Creek, Little Bear Creek, and Slaughter Creek exist within the study area (**Figure 3.7-1**). In the study area, streams generally flow from the west to the east, flowing into Onion Creek and eventually into the Colorado River (**Figure 3.7-2**).

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Figure 3.7-1: Watersheds within the Study Area

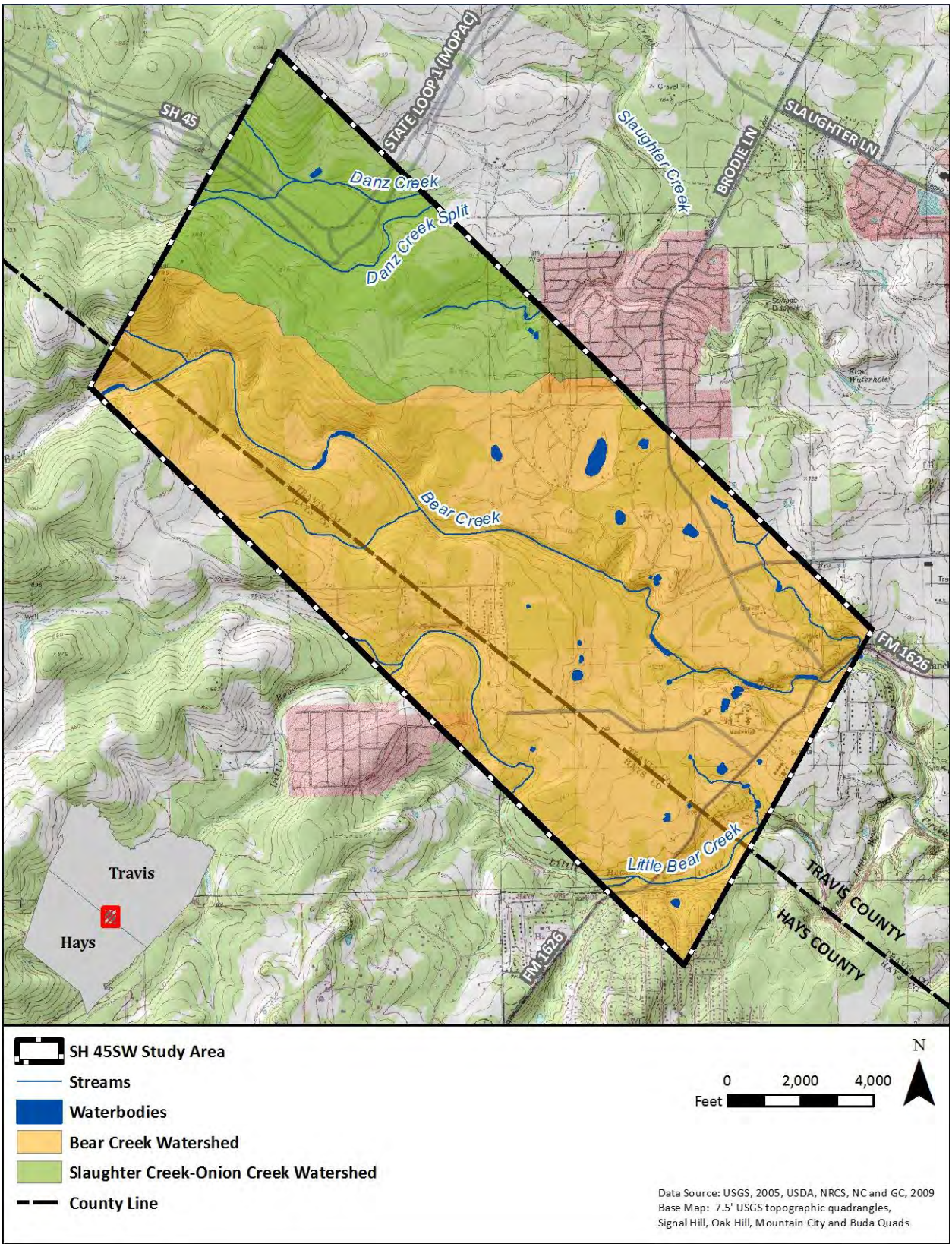

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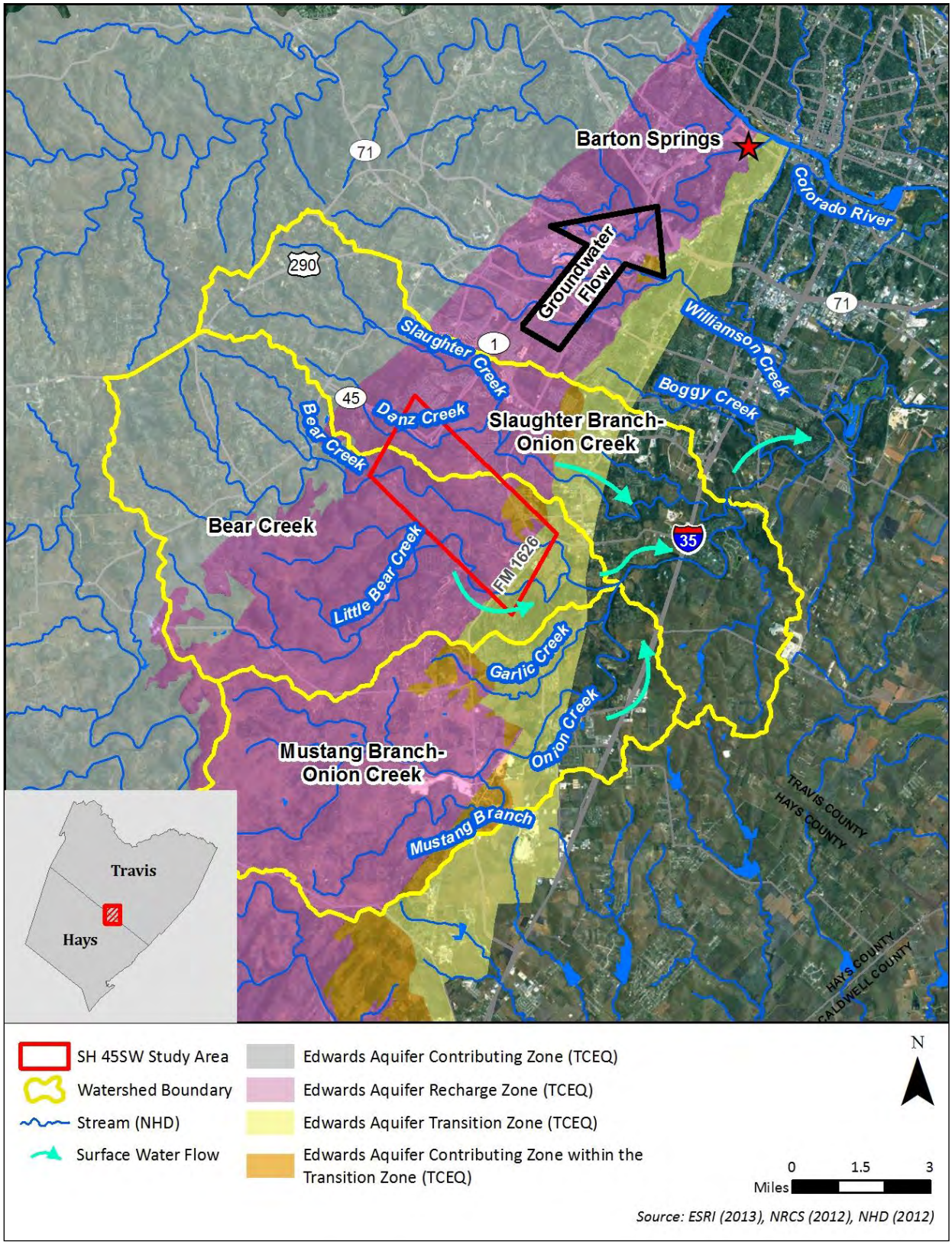
Figure 3.7-2: Water Flow from SH 45SW Study Area



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Watersheds are divided and sub-divided into successively smaller hydrologic units that encompass successively smaller geographic areas (USGS, 2013a). The largest hydrologic units are regions, which are divided into sub-regions, accounting units, and cataloging units. The Colorado River watershed falls within the Texas-Gulf Region (Region 12). The two watersheds within the study area are Bear Creek and Slaughter Creek-Onion Creek (**Figure 3.7-1**). **Table 3.7-1** provides general information about each watershed. The following paragraphs describe each watershed.

Table 3.7-1: Acreages of Watersheds in Study Area

Watershed	Watershed Area (acres)
Bear Creek	4,094
Slaughter Creek-Onion Creek	1,233

Source: (USGS, 2013b)

Bear Creek

The Bear Creek watershed is located in the southern portion of the study area and includes Bear Creek and Little Bear Creek (USGS, 2013b). Bear Creek is 17 miles long and flows from northern Hays County to southern Travis County to its confluence with Onion Creek. Bear Creek is identified as a perennial stream by the National Hydrography Dataset, but is observed to be intermittent with perennial pools in the study area. Little Bear Creek is an intermittent stream that is 15 miles long and flows into Bear Creek.

Slaughter Creek-Onion Creek

The Slaughter Creek-Onion Creek watershed is located north of the Bear Creek watershed. This watershed includes a portion of Onion Creek, as well as two intermittent water bodies that flow into Onion Creek: Slaughter Creek and Rinard Creek (USGS, 2013b). Only two streams from this watershed are present in the study area; they are Danz Creek and Danz Creek Split, two tributaries of Slaughter Creek.

Floodplains

A floodplain is a low-lying area adjacent to a river or stream that is subject to flooding. The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRMs) that delineate the base floodplain elevations and floodways for the major rivers and streams. The FEMA FIRMs (FEMA, 2013) were consulted to determine floodplains within the study area. The regulatory floodway indicates the corridor of effective flow area within the floodplain where, if the base flood encroaches equally on both banks in terms of flow

conveyance, the base flood elevation is increased no more than one foot. The 100-year floodplain includes areas that would be inundated by a flood event that has a one percent chance of being equaled or exceeded in any given year.

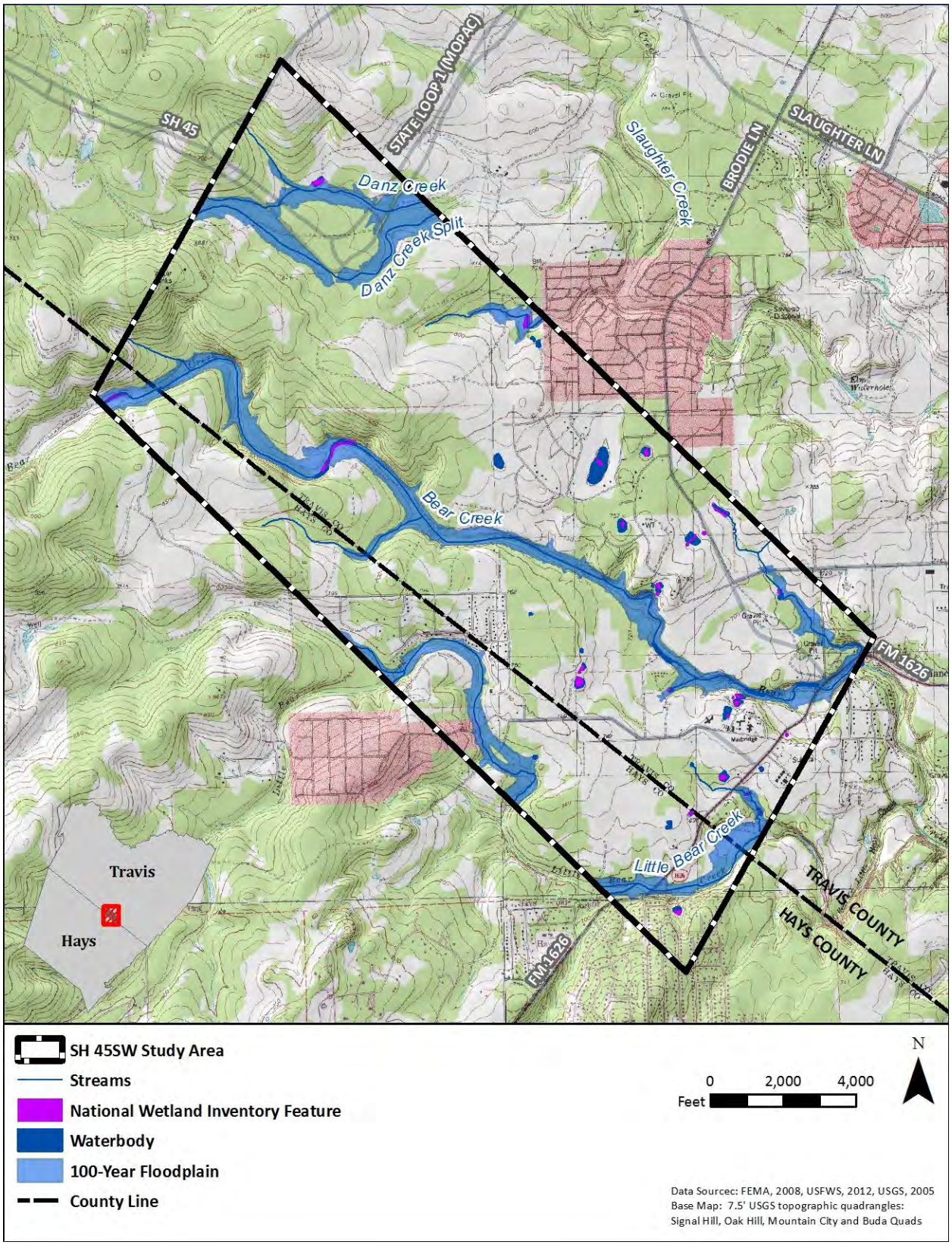
Floodplains in the study area are depicted in **Figure 3.7-3** and listed in **Table 3.7-2**. FEMA administers the National Flood Insurance Program (NFIP). Travis and Hays counties are participating members of the NFIP. If work occurs within a designated 100-year floodplain, the hydraulic design for the proposed project would need to permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream, or other property. Projects that may increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances would require coordination with the local Floodplain Administrator. Based on proposed designs, construction at all waters of the U.S. would span the OHWMs. As previously stated, the placement of support structures would not be expected to raise flood elevations; however, the placement of new structures would require coordination with the Travis County and Hays County Floodplain Administrators.

Table 3.7-2: FEMA Floodplains in Study Area

Watershed	Area of 100-year Floodplain in Study Area (acres)
Bear Creek	433
Slaughter Creek-Onion Creek	157

Source: FEMA, 2013.

Figure 3.7-3: Surface Waters and 100-Year Floodplains in Study Area



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Wetlands

Jurisdictional wetlands (i.e., wetlands that are subject to permitting under Section 404 of the CWA) are transitional areas between terrestrial and aquatic systems that are inundated or saturated by surface or groundwater at a duration and frequency sufficient to support a prevalence of hydrophytic vegetation and anaerobic soil conditions under normal circumstances. Jurisdictional wetlands are determined by the 1987 *Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region* according to three criteria: 1) the presence of hydrophytic vegetation; 2) hydric soil characteristics; and 3) wetland hydrology.

The CWA recognizes the "functions and values" of wetlands as the principle reasons for regulating wetlands and avoiding unnecessary impacts. The "function" of wetlands relates to their physical, chemical, and biological attributes. Examples of wetland functions include flood flow alteration, wildlife habitat, and groundwater recharge. The term "values" may be used to describe those functions that are generally regarded as beneficial to society. Recreation and uniqueness are examples of values. Functions and values are typically associated and weighed by a combination of a wetland's inherent capabilities and the opportunity to perform those capabilities.

In general, wetland resources can be classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin system. The Cowardin system differentiates wetland types on the basis of ecological systems, subsystems, and classes (Cowardin, 1979). Systems are broad groupings of wetland habitats which share similar hydrology, geomorphology, chemistry, and biological characteristics. Only one of the three parameters required by USACE is necessary to establish a wetland using the Cowardin designation as applied on National Wetlands Inventory (NWI) maps; therefore, wetlands mapped by NWI may not be jurisdictional wetlands regulated by USACE. Wetland types identified within the study area include freshwater emergent wetlands and freshwater ponds. **Figure 3.7-3** identifies NWI wetlands within the surface water study area, and **Table 3.7-3** lists acreages of each type of potentially jurisdictional wetland and other waters within the surface water study area.

Table 3.7-3: Potentially Jurisdictional Wetlands and Other Waters in Surface Water Study Area (Polygons)

Wetland Type	Potentially Jurisdictional Wetlands or Other Waters	Acreage Within Study Area
Palustrine	Freshwater Emergent Wetland	11.7
	Freshwater Pond	1.9
Total		**13.6**

Source: USFWS, 2012.

Palustrine features include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent. Palustrine systems are bounded by uplands or any of the other Cowardin systems. Examples of palustrine systems include marshes, swamps, and bogs.

According to the NWI, there are approximately 13.6 acres of palustrine wetlands within the watershed study area (**Table 3.7-3**) (USFWS, 2013). This acreage includes approximately 11.7 acres of freshwater emergent wetlands and approximately 1.9 acres of freshwater ponds Freshwater emergent wetlands would be jurisdictional provided they are adjacent to navigable waters, within the 100-year floodplain, and/or are connected by a surface tributary to a navigable water. The jurisdictional status of these areas would be determined during the USACE verification process.

Aerial photographs and NWI maps were analyzed and used to identify the location and extent of potential wetland resources within the study area. Potential wetlands and other waters of the U.S. identified within the study area occur in various sizes, but are generally small and associated with 100-year floodplains along streams. No wetlands were identified within the state-owned ROW during field investigations (see **Appendix J: *Waters of the U.S. Evaluation Technical Report***).

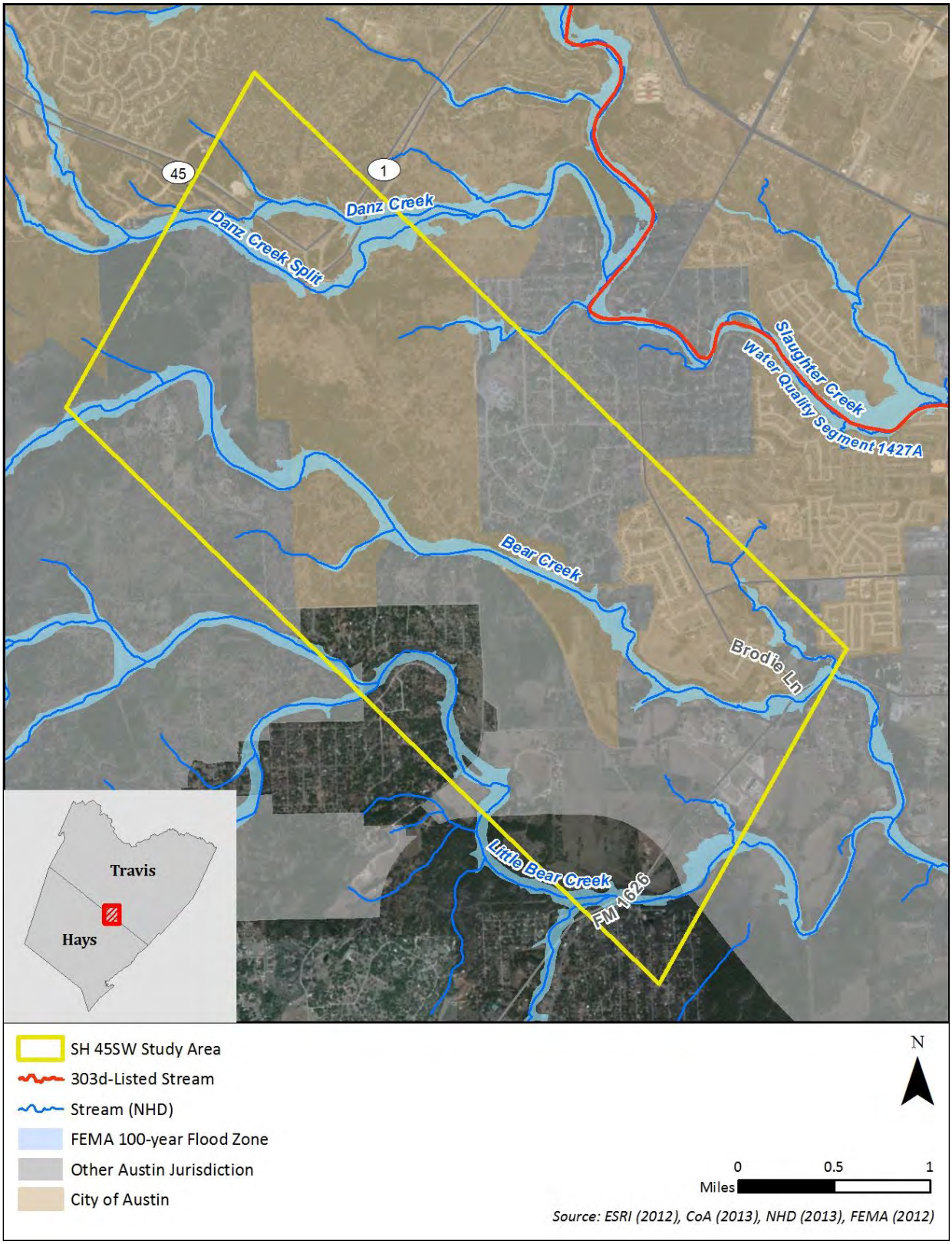
Water Quality

The SH 45SW study area is located within the Colorado River basin. The Colorado River stretches approximately 900 miles across Texas, making it the longest river in the United States contained within the borders of one state.

The COA Water Utility department provides potable treated water for the majority of the study area. Sources for the drinking water include surface water from the Colorado River. Contaminants in the source water may include microbes, inorganic and organic substances, pesticides and herbicides, and radioactive materials (COA, 2012b). Data regarding water quality trends in the study area are found in the ***Cumulative Impacts Technical Report*** (**Appendix I**).

For the purposes of water quality management, the Colorado River basin has been divided into 34 segments. Elevated nutrient levels and fecal coliform densities found in many of the tributary streams in the Austin area originate mostly from unidentified non-point source runoff (TCEQ, 2011). According to the TCEQ 2012 Section 303(d) list, the study area encompasses Water Quality Segment 1427A – Slaughter Creek, which is just north of the study area (**Figure 3.7-4**). Defined uses of the segment include aquatic life use, contact recreation use, and fish consumption use (TCEQ, 2002). The segment is identified on the 303(d) list due to an impaired macrobenthic community (visible organisms found on/in the creek soil) (TCEQ, 2013). Only natural and unknown sources were identified as potential sources of impairments for this segment (TCEQ, 2013).

Figure 3.7-4: Water Resources in Study Area



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Per the MOU between TxDOT and TCEQ described in 43 TAC Chapter 2, Subchapter I, TxDOT may coordinate with TCEQ in the development of proposed projects in the interest of water quality protection. Water quality protection through permitting programs, BMP requirements, and monitoring are discussed further in **Section 6.5.1**. TSS is a constituent of stormwater that is often measured as an indicator of overall water quality and is a focus of water quality regulations and performance standards in part because of its correlation to other pollutants that occur as particles (it serves as a surrogate in calculating removal efficiencies), the tendency of hydrophobic pollutants to adsorb to clay and silt particles, and the positive effects that TSS removal has on the removal of other constituent pollutants (Texas Register, 1998).

3.7.2 Direct Effects

Build Alternative

The proposed project would involve construction of a new location roadway within previously acquired state-owned ROW. This section discusses the potential impacts of project construction, including an assessment of temporary construction impacts and long-term operation and maintenance related impacts. Water quality protection strategies proposed for the proposed project are summarized below and detailed in the ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H**).

Waters of the U.S./Wetlands

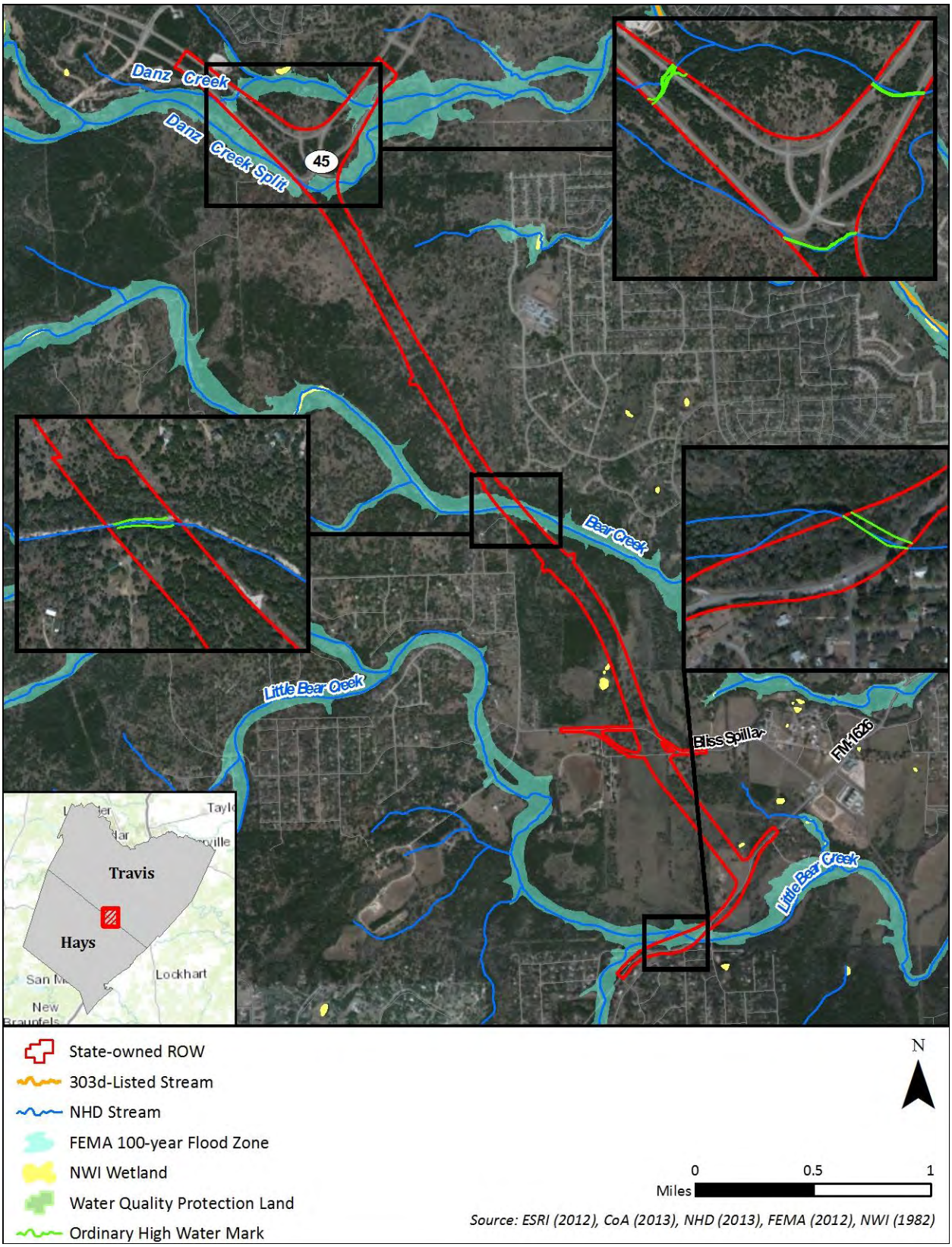
A review of USGS topographic maps, mapped FEMA floodplains, National Hydrography Dataset (NHD) data, recent and historic aerial imagery, soil surveys, and NWI wetland data was conducted for this analysis. Field investigations to identify waters of the U.S. features in the state-owned ROW were conducted between December 2013 and February 2014. Waters of the U.S. present in the state-owned ROW include Danz Creek, Danz Creek Split, Bear Creek, and Little Bear Creek (see **Figure 3.7-5**). One additional aquatic feature, an isolated livestock pond, extends into the western portion of the state-owned ROW but is not expected to be considered a water of the U.S. by the USACE because it is not connected to a USACE jurisdictional stream. No wetlands subject to USACE jurisdiction were identified within the state-owned ROW during field investigations. Further details are provided in the ***Waters of the U.S. Evaluation Technical Report*** in **Appendix J**.

Impacts to waters of the U.S. resulting from the discharge of dredged or fill material are regulated by USACE under Section 404 of the CWA. If a linear transportation project places less than 0.5 acre of fill into a single and complete crossing of a water of the U.S., it would typically be authorized under Nationwide Permit (NWP) 14; impacts of more than 0.5 acre require an Individual Permit (IP). Impacts authorized under NWP 14 which equal or exceed 0.1 acre require a Pre-Construction Notification (PCN) to USACE. Impacts to wetlands (of any

amount) would also require a PCN. If no fill is placed into the creek, then no Section 404 permits would be required for the proposed project. Based on current design concepts, the OHWM of creeks would be bridged at the crossing locations; therefore, a NWP would not be required.

Temporary construction impacts would be minimal due to construction techniques or activities (e.g. coffer dams, temporary access roads, work platforms).

Figure 3.7-5: Surface Water Resources in SH 45SW ROW



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Surface Water Resources

A summary of potential impacts resulting from the construction of SH 45SW is provided below. A more detailed discussion of potential impacts as well as project-specific minimization and mitigation measures is provided in the ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H**). During the construction phase, site preparation activities such as grading, excavating, trenching, boring, and clearing vegetation result in exposed soil. In addition to this disturbance of native soil, it is often necessary to bring new soil onto the site to be used, for example, in building up roadbeds. Construction sites, therefore, may create areas of loose soil that are particularly susceptible to erosion. Though these areas of loose soil are not permanent, they may be erodible until final revegetation of the ROW. Erosive forces associated with stormwater come both from rain that falls directly onto the proposed project site and from overland flow that originates up-gradient and crosses the proposed project site. Once eroded, soil will be transported down-gradient and deposited. This deposition, also known as sedimentation, may occur on a variety of locations including on another upland site, in a water body, or in an aquifer recharge feature (such as a cave or sink). Dye trace studies have shown that potential pollutants in Bear Creek can reach Barton Springs (through groundwater paths) in about two days (Hauwert, 2012). Groundwater flow is dependent on aquifer conditions. (See **Section 3.6**.)

The erosion and sedimentation of soil and other particles from construction sites can have direct negative impacts on water quality. When introduced into aquatic environments, particles can impact biota by abrading or clogging sensitive organs (e.g. gills). Excessive sedimentation may also cover essential habitat of aquatic animals and plants. Aquatic plants may also be directly shaded by particles suspended in the water column. Sediment may be indirectly associated with a number of other impacts as well by acting as a vector for pollutants and contributing to the degradation of a variety of water quality indicators. Typical TSS loads from undeveloped areas and from highway runoff are given in **Table 3.6-2.**

The potential impacts to water quality and aquatic resources that may result from construction and operation of the proposed project have been quantified based on the use of specific BMPs which are proposed to avoid, reduce, or compensate for these impacts. Utilizing the proposed approach, construction phase contamination would be prevented by adherence to environmental commitments, while post-construction TSS levels in treated stormwater would be lower than “background” loads of stormwater runoff from areas similar to the state-owned ROW (the No Build). While TSS is a principal concern during both construction and operation of roadways, the BMPs that are proposed as part of this proposed project would address other roadway-associated pollutants such as heavy metals, nutrients, and hydrocarbons.

Construction Phase Water Quality Impacts

The proposed aquatic resource protection measures would, if fully implemented, result in negligible impacts to surface and groundwater quality during construction. Staged construction, limited soil disturbance, and the preservation of natural vegetation would minimize erosion and decrease the likelihood of sediment discharges. In addition to the six existing sand filtration basins (vertical sand filters) located at the existing MoPac and SH 45 facilities (one of which does not drain the project area), ten water quality ponds with hazardous material trap capabilities are proposed to be built for the treatment of stormwater throughout the SH 45SW corridor. These permanent BMPs would be installed as early as practicable during the construction phase of the proposed project to allow for the temporary detention and treatment of on-site stormwater. Ponds similar in design to those proposed have been shown to reduce TSS levels by 91 percent (Middleton et al., 2006). To further protect against sediment discharge, sediment control BMPs such as rock berms and erosion control logs would also be installed as appropriate. Standard rock berms have been shown to retain approximately 70 (FDEP, 2013) to 95 percent of TSS loads (EPA, 2014). Erosion control logs have demonstrated a 95 percent TSS removal rate (COA, 2012a). Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable. Utilization of a full-time Environmental Compliance Manager would ensure strict adherence to environmental commitments and provide direction regarding continual improvement. The proposed approach has been used successfully on other recent local projects in environmentally sensitive areas (such as COA Water Treatment Plant 4, SH 130, and 183A) in order to ensure non-degradation of water quality.

Water Quality Impacts Associated with Roadway Operation and Maintenance

During the operation of the proposed roadway, multiple levels of treatment of stormwater runoff would be in place. PFC pavement and water quality ponds are currently proposed for a minimum of two levels of treatment. In most areas, VFS would provide a third level of treatment. In addition, a portion of the design would also include grassy swales, which would provide an additional level of treatment. In areas where PFC pavement is not appropriate (such as bridges) stormwater from the roadway would be drained through a collection system into water quality ponds for treatment. Several of these key permanent BMPs are presented in **Table 3.6-7** along with their removal efficiencies related to TSS as well as other highway-associated pollutants. The efficiencies noted represent the potential removal rates of these BMPs in a stand-alone situation and variation in efficiencies may be found between studies. For example, Sampson et al. (2013) reported TSS removal rates for PFC equaled 92 percent.

As previously mentioned, stormwater would be treated by a series of BMPs, thus increasing the potential pollutant removal rates. TCEQ establishes accepted removal efficiencies for use in TSS treatment calculations, and while these efficiencies may vary slightly

from other published data (for example, see **Table 3.6-7**), they would be used for final treatment calculations on the proposed SH 45SW. Based on these TSS removal and efficiency calculations for BMPs in series, select BMP efficiencies in stand-alone applications and in series are presented in **Table 3.7-4**. Refer to **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report*** for further discussion of different types of water quality ponds.

Table 3.7-4: TCEQ-Accepted Removal Efficiencies

	Stand-alone					In Series	
	PFC	**Water Quality Ponds (Sand Filter Systems)**	**VFS[1]**	**Batch Detention Ponds**	**Grassy Swales**	**PFC & VFS[1]**	**PFC & Ponds**
TCEQ Accepted TSS Removal Efficiencies (%)	90	89	85	91	70	96	95

Source: TCEQ, 2005, 2009, 2012.
[1] Vegetative Filter Strips

With existing BMPs in place, there are currently 18,182 pounds of TSS generated per year within the state-owned ROW. Of that total, 11,620 pounds per year are generated over the Recharge Zone (see **Table 3.7-5**). If the proposed project were implemented, approximately 86,865 pounds TSS load would be generated within the state-owned ROW each year before treatment. Of that amount, approximately 56,233 pounds per year would be associated with the impervious cover added by the project, this is the project's total incremental increase in TSS load. The Edwards Aquifer Rules (30 TAC 213) require the treatment of stormwater runoff from projects over the Edwards Aquifer Recharge Zone such that 80 percent of the incremental increase in TSS load generated is removed before the water is released. Through the proposed configuration and new BMPs, 60,339 pounds of TSS would be removed from stormwater in the state-owned ROW. Because this would include removal of a portion of the existing load, the treatment scenario proposed by TxDOT would exceed the 80 percent removal required by the Edwards Aquifer Rules and remove a load equal to 107.3 percent of the incremental increase. This would essentially result in an improvement over the existing condition whereby the annual TSS load generated over the Recharge Zone is reduced by 21.7 percent from an existing level of 11,620 pounds per year to approximately 9,096 pounds of TSS per year after construction (see **Table 3.7-5**). Although stormwater treatment is not required over the Transition Zone (30 TAC 213), current design proposals would include stormwater treatment in these areas as well.

Treatment of stormwater runoff would thus allow for a net decrease of 4,107 pounds per year in annual TSS loading within the state-owned ROW (an improvement over the No Build). Based on the net load of TSS that would be generated over the Recharge Zone and rainfall data for the area (65.8 acres [existing plus proposed impervious cover] over the Recharge Zone and a 32 inch/year average rainfall), [(9,096 lbs TSS/yr) / (175.5 acre-feet of rainfall / year)], average TSS concentrations of treated stormwater runoff from areas of the proposed project over the Recharge Zone would average approximately 19.1 milligrams/liter (mg/L) (1 lb/acre-foot equals 0.368 mg/L).

Table 3.7-5: TSS Load and Removal Amounts for Proposed BMP Configuration

Condition	Total Area (ac)	Existing		Proposed		Existing Post-Treatment Load Generated (lbs/yr)	Proposed Load Generated (lbs/yr)	TCEQ Required Removal (lbs/yr)	Actual Removal		Load in Treated Runoff (lbs/yr)
		Impervious Area (ac)	Pervious Area (ac)	Impervious Area (ac)	Pervious Area (ac)				Lbs/yr	%	
Recharge Zone	278.02	17.67	260.35	65.81	212.21	11,620	52,432	41,946	54,955	104.8	9,096
Transition Zone	21.66	5.68	15.98	9.17	12.49	6,562	3,801	3,041	5,384	141.6	4,979
Total Project	299.68	23.35	276.33	74.98	224.7	18,182	56,233	44,987	60,339	107.3	14,075

Source: RTG, 2014
Note: The area of the transition zone used in this calculation does not include 11.97 acres of the total project area, as the additional 11.97 acres would not require any ground disturbance since work in this area would be limited to pavement marking.

Water quality sampling reported by COA in Onion Creek below its confluence with Bear Creek, and also below the proposed project site showed TSS loads (reported as total non-filterable residue) ranged from less than one mg/L to 23 mg/L (LCRA, 2013a). The same range was reported at a TCEQ sampling site on Upper Bear Creek downstream from RM 1826 (LCRA, 2014). TSS measurements in Danz Creek reported by Barrett et al. (1995a) above a roadway construction site ranged as high as 266 mg/L and averaged 59.9 mg/L. The expected 19.1 mg/L TSS concentration shown in **Table 3.6-6** is well within the typical range of surface water in streams near the state-owned ROW and well below TSS peaks that have been recorded. A 2006 study by COA evaluating stormwater runoff quality and quantity from small watersheds in Austin showed no significant trends in TSS levels associated with impervious cover or development condition, and found that 153.7 mg/L was reflective of TSS concentrations in stormwater runoff city-wide (COA, 2006).

Impacts to Aquatic Resources/Potential Salamander Habitat

The following section provides background information regarding the connection between surface water quality and spring habitat. Surface water within the study area can enter groundwater recharge features, thus the focus on surface water quality protection strategies proposed for SH 45SW serves a dual purpose of protecting groundwater quality as well as spring-dependent species. Studies have shown that water in the aquifer may move at rates of 2.3 to 7.4 miles per day (Hunt, 2006), and increased storm flow in creeks in the Recharge Zone has been shown to result in predictable changes in water quality parameters in Barton Springs after a short temporal lag (Hunt, 2013). Sediment-laden stream water may also plug swallets

with sediment, closing off potentially important paths of aquifer recharge. Low flows in Barton Springs have been associated with increased specific conductance (Mahler, 2006) and decreased dissolved oxygen levels (Turner, 2009), both of which can negatively affect spring-dependent biota.

Water quality degradation is identified as a threat to both the Austin Blind salamander (USFWS, 2013a) and the Barton Springs Salamander (USFWS, 2005). The Barton Springs salamander Recovery Plan identifies dissolved oxygen, conductivity, sediments, metals, nutrients, pesticides, and hydrocarbons (including PAHs) as key water quality parameters of concern. To reduce potential water quality threats, TxDOT and the Mobility Authority would agree to abstain from the use of pesticides (including herbicides) in conjunction with the maintenance of the proposed SH 45SW. Many of the other parameters listed are interrelated, and mitigation efforts can affect them broadly.

TSS is often used in regulatory frameworks as a water quality parameter that may act as a surrogate parameter or design parameter because its concentration may indicate broader water quality. This is due in part to the occurrence of some pollutants as particles and also to the tendency for other pollutants to adsorb to particles. TSS is related to each of the parameters of concern identified for the Barton Springs salamander. TSS, as a design parameter, can include many constituents, and these constituents may vary by source. For instance, constituents found in agricultural runoff, roadway runoff, and grassland runoff may differ in the types and relative amounts of constituents present. Barrett and others (1995b) and Geismar (2000) point out that metals, hydrocarbons, chlorinated pesticides, and polychloronated biphenyl (PCB) are hydrophobic constituents that adsorb to sediment particles. Sediment-associated pollutants can also introduce an oxygen demand and influence conductivity (USFWS, 2005). A design goal of the proposed project would be to achieve, at a minimum, a 90 percent removal of the post-construction TSS load generated by the increase in impervious cover over the Edwards Aquifer Recharge Zone. Currently proposed BMP configurations would exceed the design goal and remove a TSS load that would equal 107.3 percent of the incremental increase in TSS associated with the project.

Untreated roadway runoff may have elevated amounts of heavy metal constituents that can induce toxic effects in aquatic environments (Kearfott et al., 2005). Lead is a roadway-associated heavy metal that may be strongly adsorbed to particles while others such as zinc, cadmium, and copper may be largely dissolved (Sansalone et al., 1997). Each of the elements in the proposed system of BMPs has been shown to reduce concentrations of both adsorbed and dissolved heavy metal constituents (see ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H** for more detailed discussion). TCEQ Surface Water Quality Standards establish concentrations of potentially toxic constituents, including heavy metals, below which aquatic life should be protected (30 TAC 307). Aquatic life protection standards of many heavy metals are determined based on the hardness of the water body being sampled, with toxicity decreasing as water hardness increases. A formula for these standards can be

found in Table 1 of 30 TAC 307.6(c)(1). Water discharged at Barton Springs is classified as very hard (USFWS, 1992). Therefore, possible effects of heavy metal constituents would be reduced by the use of BMPs and further diminished by natural chemical processes.

Boyles et al. (2006) related increases in urban stormwater constituents including chloride, magnesium, nitrate, potassium, sodium, and sulfate to increases in specific conductance. Of these water pollutants, magnesium and potassium are not attributed to roadway stormwater, while chloride and sodium arising from deicing operations are frequently attributed to roadway stormwater, as are sulfates from roadbeds and derivatives of fuels (EPA, 1993). Given the rarity of deicing operations in the study area, only one pollutant examined by Boyles et al. (2006) (sulfates) would be expected to arise from the proposed project and possibly contribute to changes in specific conductance. Mahler et al. (2006) reported specific conductance measurements with an equilibrium value between 530 and 630 microsiemens per centimeter (µS/cm) in the major outlets of the Barton Springs complex except Old Mill Spring, which was frequently above 700 µS/cm. The equilibria in values were disrupted, it was presumed, by storm events which resulted in short peaks followed by sharp drops in conductance. The higher readings in Old Mill Spring may be due to differences in groundwater flow paths. Specific conductance varies due to aquifer levels, recharge rates, and groundwater chemistry. Recent surface water-specific conductance readings measured by COA in Bear Creek range between 530 and 1,140 µS/cm (LCRA, 2013a), and levels reported at a TCEQ site on Onion Creek below the proposed project site and below its confluence with Bear Creek ranged from 481 to 692 µS/cm (LCRA, 2014). The proposed project is not expected to have a substantial effect on specific conductance in surface waters or Barton Springs discharge due to the natural variation of specific conductance and due to the lack of contributing stormwater runoff constituents.

The risk of harm to the Barton Springs salamander and Austin blind salamander would be minimized through the use of robust BMPs proposed for construction, operation and maintenance of the proposed facility; adherence to Edwards Aquifer Rules including the preparation, submittal, and approval of a WPAP; and adherence to TPDES through the preparation of a Storm Water Pollution Prevention Plan (SW3P). Based on high TSS removal rates and the chemical processes that limit the availability of heavy metals, the proposed project would not be expected to have a measureable effect on water quality-dependent sensitive aquatic resources such as the Barton Springs or Austin blind salamanders. Potential impacts to groundwater quantity are discussed in **Section 3.6.2**.

Sensitive Feature Impacts

Sensitive features may serve as conduits to the aquifer below or may serve as habitat to troglobitic species. In each regard, the quality and quantity of the water that reaches these features would be protected to the greatest extent practicable to ensure that the aquifer's water and the potential habitat are protected.

Sensitive features would be protected, where applicable, by buffers and temporary BMPs. Permanent protections would include stormwater treatment by water quality ponds as well as by structural and vegetative BMPs in other areas. The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge.

Hazardous Materials Impacts to Water Quality

The proposed project could increase the potential for accidental spills of hazardous materials in the state-owned ROW due to introduction of a new-location roadway facility. However, unlike many of the existing roadways in the area, the SH 45SW facility would include water quality ponds/hazardous material traps (HMTs) with detainment capabilities. These ponds would capture roadway runoff, including hazardous materials spills, from all portions of the roadway except in certain small areas in intersections where it is not practicable to establish grades that would allow draining runoff to HMTs.

Detainment volumes would meet or exceed applicable requirements, with the goal of full containment of probable spill volumes. TCEQ (2007) recommends 10,000-gallon HMT as an optional enhanced Edwards Aquifer protection measure on roads with the ability to convey at least 25,000 vehicles a day. Currently proposed water quality ponds would be sized to accommodate up to four inches of rain from a single rainfall event. These ponds would be sized to capture more than ten times the recommended volumes. This would reduce the likelihood that spill detainment would be compromised in the event of spills that occur during rain events.

The Barton Springs Salamander Recovery Plan (USFWS, 2005) identifies hazardous materials spills on bridges as being of particular concern because of the high recharge potential associated with creeks. Current design would allow for total capture of runoff from bridge surfaces. This would allow for the detainment of hazardous material spills and prevention of contaminated water recharging to the aquifer.

The risk of harm to the Barton Springs salamander and Austin blind salamander from potential hazardous material spills associated with the proposed SH 45SW would be reduced to insignificant levels by the capture and detainment capabilities of the proposed HMTs.

Floodplains

Approximately 18.55 acres of floodplains associated with Slaughter Creek and its tributaries, 5.91 acres of floodplains associated with Bear Creek, and 4.74 acres of floodplains associated with Little Bear Creek occur within the SH 45SW ROW (see **Figure 3.7-5**). Based on current design, the OHWM of the creeks would be bridged. Bridge piers would not be placed

such that they would increase the base flood elevation; therefore, no floodplain impacts would be expected to occur as a result of the proposed project. However, because the proposed project would consist of new construction, coordination with the local Floodplain Administrator would be required.

Surface Water Quality Regulatory Compliance

A portion of the study area is drained by two tributaries of Slaughter Creek (known as Danz Creek and Danz Creek Split). Slaughter Creek is classified as impaired on the most recent (2012) Texas Water Quality Inventory and 303(d) list due to an impaired macrobenthic community. Measures would be taken to prevent the further degradation of water quality as a result of the proposed project, as described below.

EPA's National Pollutant Discharge Elimination System (NPDES) permit program under the CWA controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered by TCEQ as part of the TPDES. Stormwater runoff resulting from the proposed project would be addressed through compliance with the TPDES Construction General Permit. More than five acres of earth disturbance would occur as a result of the project; therefore, a SW3P, construction site notice, and Notice of Intent (NOI) would be required.

Implementation of robust BMPs and a WPAP during construction and operation of SH 45SW, including erosion controls, sedimentation controls, and post-construction TSS controls, would avoid or reduce impacts to water quality. Examples of BMPs that could be used during project construction include mulch logs, rock filter dams, and silt fences, which are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H**). Potential hazardous material detainment and treatment would be addressed through the use of several structural and non-structural BMPs, including the placement of water quality ponds/hazardous material traps at key locations. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series with each in the line removing additional TSS and other pollutants, including the use of PFC pavement and VFS/grassy swales. Pollutant removal rates through these combined BMPs can exceed 90 percent, as discussed in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***. At least 90 percent of the incremental increase in TSS load that is generated over the Recharge Zone would be removed by permanent, post-construction BMPs.

No Build Alternative

Under the No Build Alternative, no project-related direct impacts to waters of the U.S. or other surface water resources would occur.

3.7.3 Proposed Surface Water Quality Protection Measures

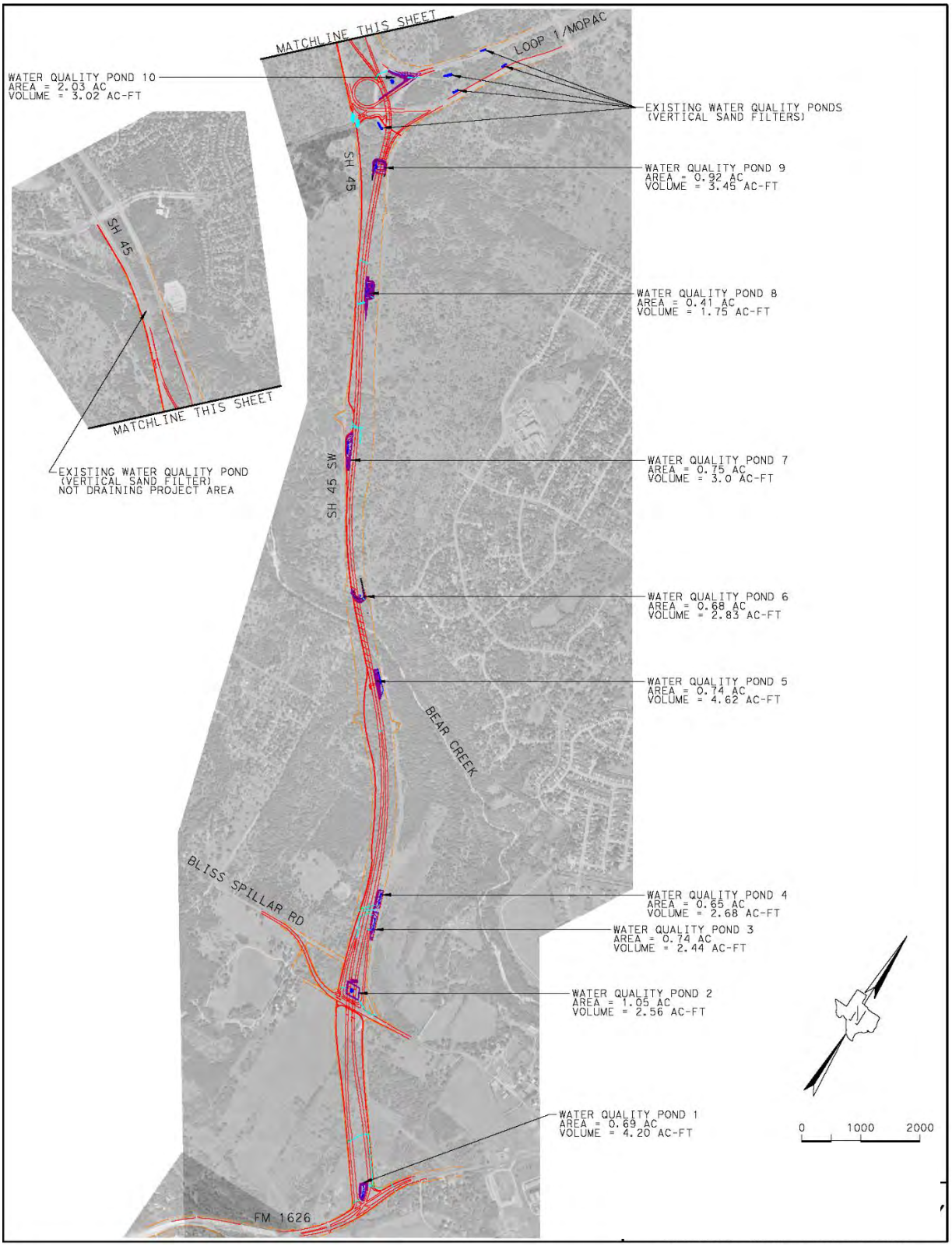
Minimization of impacts to sensitive resources would be achieved through specific design measures and BMPs implemented for the proposed project.

Research grants provided by TxDOT funded several studies beginning in the 1990s which characterized the effects of highway construction and operation on stormwater quality and quantity. Several of these studies were conducted along MoPac and used simulated rain events to generate runoff that could be systematically collected and analyzed. Among the final conclusions pertaining to highway operation and maintenance were that "little adverse impacts would be expected for all but the most sensitive receiving waters based on the quantity and quality of runoff generated during storms" and that "a grassy swale was found to be effective for reducing runoff volumes and pollutant concentrations." See Barrett, et al. (1995b) for a more complete review of early studies and findings. Further research into vegetative control measures such as VFS and grassy swales found that VFS can remove up to 97 percent of TSS and up to 99 percent of metals (Barrett, 2004). The use of PFC pavements, which were initially intended to improve aspects of traffic noise and wet weather visibility, has proven to yield water quality benefits as well. Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008) can be removed from highway runoff as it passes through these permeable road layers. The use of these and other water quality control measures can substantially reduce pollutant loading associated with highway stormwater runoff. When design constraints allow, the proposed project would use these and other water quality tools in series to further reduce pollutant loading in highway stormwater runoff. See the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H** for a more complete discussion of design goals, related studies, and findings.

For the majority of the SH 45SW roadway, PFC and water quality ponds are currently proposed for a minimum of two levels of treatment. Water quality ponds are designed to allow sediment to settle out of runoff and also to capture any potential hazardous material spills. Ponds would be sized to accommodate up to four inches of rain from a single rainfall event while meeting the treatment goal of removing at least 90 percent of the post-construction TSS load associated with the incremental increase in impervious cover over the Recharge Zone. Furthermore, they would be designed to slowly release detained water, which decreases peak flows. In addition to the six existing vertical sand filters with hazardous material containment capabilities at the existing MoPac and SH 45 facilities (one of which does not drain the project area), ten new water quality ponds/hazardous material traps are proposed for the treatment of stormwater throughout the SH 45SW corridor. Previous designs, which were presented in the DEIS, included 11 new water quality ponds; however, the project was realigned in response to public and agency comments and information gathered during karst investigations and a Geologic Assessment (SWCA and Cambrian Environmental, 2014), and the number of new ponds necessary was reduced to ten. These new permanent BMPs would be installed as early

as practicable during the construction of the proposed project to allow for the detention and treatment of on-site stormwater. Staged construction, limited soil disturbance/preservation of natural vegetation, and soil stabilization BMPs would be in place through construction to decrease erosion and ensure that off-site discharge of sediment is minimized to the greatest extent practicable. All SH 45SW roadway runoff would flow through a water quality pond except for small areas at the intersections where it would not be possible to establish grades that would drain surface flow to ponds (see **Figure 3.7-6** for proposed locations). The areas at MoPac, however, would flow into existing sand-filtration ponds. In these areas, the runoff would still flow along PFC as one form of treatment. In most areas, VFS would provide a third level of treatment. In addition, a portion of the design would also include grassy swales, which would provide an additional level of treatment. In areas where PFC is not appropriate (such as bridges) stormwater from the roadway would be drained through a collection system into water quality ponds for treatment – all runoff from bridge decking would be captured and treated.

Figure 3.7-6: Proposed SH 45SW Water Quality Pond/HAZMAT Trap Locations



Source: RTG, 2014

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Sensitive karst features would be protected, where applicable, by buffers and temporary BMPs as described in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**. Permanent protections would include stormwater treatment by water quality ponds as well as by structural and vegetative BMPs in other areas. The quality and quantity of recharge reaching sensitive karst features would be preserved to the greatest extent practicable, as would be the case at Flint Ridge Cave where the state-owned ROW intersects part of the cave's surface catchment basin. Previous estimates of the cave's surface catchment basin have ranged from approximately 40 acres to approximately 69 acres. By combining digital data with one-foot contour intervals and field reconnaissance, the SH 45SW team has delineated an approximately 55.5-acre catchment basin that they believe best represents true conditions. In response to public and agency comments and information gathered during karst investigations and a Geologic Assessment (SWCA and Cambrian Environmental, 2014), new efforts were made to further minimize impacts to the surface catchment basin as compared to the alignment previously presented in the DEIS. A previously proposed surface water management berm is no longer needed to maintain the size of the surface catchment basin for Flint Ridge Cave and has been removed. The alignment was shifted to the west as much as physical constraints would allow. This resulted in impacts to approximately 0.7 acre (approximately 1.3 percent) of the surface catchment basin, which is considerably less than the previously proposed 5.6 acres of impacts. To compensate, an equivalent area of adjacent land would be re-graded to allow surface water to flow into the catchment basin. In order to protect the recharge water quality, untreated stormwater runoff from the roadway would be prevented from entering the catchment basin. This would be accomplished through the installation of concrete traffic barriers and accompanying stormwater infrastructure that would convey roadway runoff to a water quality pond situated outside of the surface catchment basin where the water would be treated and then discharged to Bear Creek. See **Figure 3.7-7**. Previously proposed alignments would have impacted approximately 5.6 acres of Flint Ridge Cave's surface catchment basin. In addition to the minimization of basin impacts, the re-alignment allowed for the roadway to be moved outside of the 345-foot foraging radius of sensitive troglophilic species associated with karst features such as Flint Ridge Cave.

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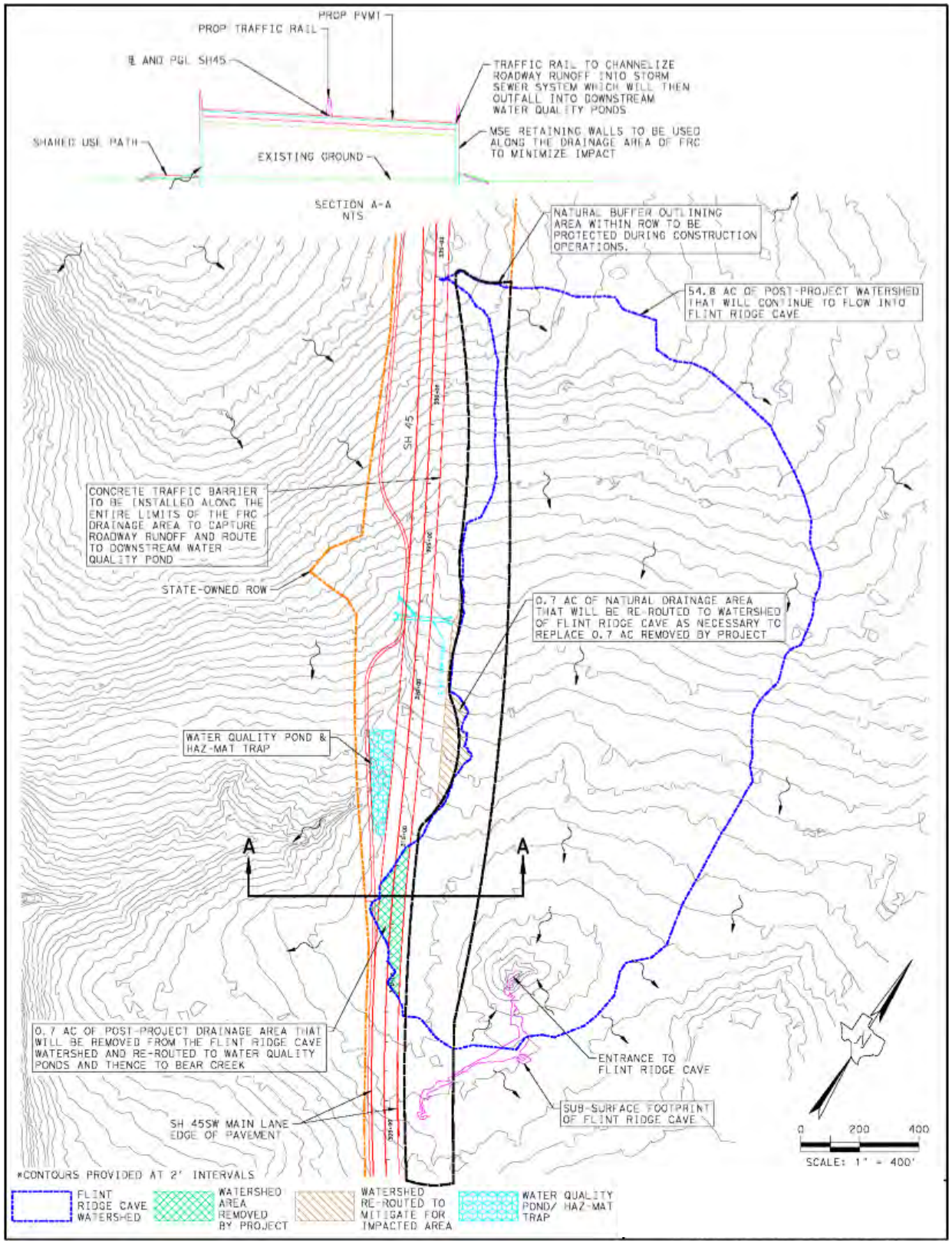
Figure 3.7-7: Flint Ridge Cave Protection Measures



Source: RTG, 2014

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Two sensitive features that have surface openings and portions of their surface catchment basins located in the state-owned ROW would be impacted by the proposed alignment. Additional specific measures have been incorporated into the current project design to minimize impacts to these sensitive features and to mitigate impacts that were found to be practically unavoidable. Feature #55 and Feature #23 (a.k.a. Hat Sink), two sensitive features identified in the *Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays Counties, Texas* (SWCA and Cambrian Environmental, 2014) would each have portions of their surface catchment basins removed; however, current design would not require either of these features to be filled. Efforts made to protect the function of each feature and its catchment basin are described below. Additional information on these and other sensitive features is available in ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**.

Based on current design information, Feature #55, a sensitive feature located within a minor drainage channel, would be covered by roadway construction. The current alignment resulted from efforts to protect the integrity of Flint Ridge Cave. Approximately 2.24 acres (approximately 13.8 percent) of the 16.26-acre drainage area of Feature #55 would be impacted. Compensatory surface flow would be diverted by vegetated diversion dikes and the raised road bed from adjacent areas into the surface catchment basin of Feature #55. Because the surface expression of this feature occurs directly beneath the roadway's proposed alignment, and because the feature occurs in a drainage channel, the roadway design has been modified to include a bottomless culvert that would span the feature and the drainage channel that it occurs in. Stormwater from the roadway would not be allowed to comingle with surface flow from the catchment basin. Stormwater from the roadway would be collected via traffic rails and conveyed conduits to a water quality pond for treatment before its eventual release to Bear Creek. See **Figure 3.7-8** and the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H** for additional details.

Approximately 0.13 acre (approximately 10.9 percent) of the 1.194-acre surface drainage basin of Hat Sink (Feature #23) would be intersected by the proposed roadway. A vegetated diversion dike would allow surface flow to be captured on an adjacent, equivalently sized area to compensate for the lost catchment. Surface flow would be conveyed under the roadway via culverts, and natural buffers would be established surrounding the openings to both the feature and the culvert. Stormwater from the roadway would not be allowed to comingle with surface flow from the catchment basin. Stormwater from the roadway would be collected via traffic rails and conveyed conduits to a water quality pond for treatment before its eventual release to Slaughter Creek. See **Figure 3.7-9** and the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H** for additional details.

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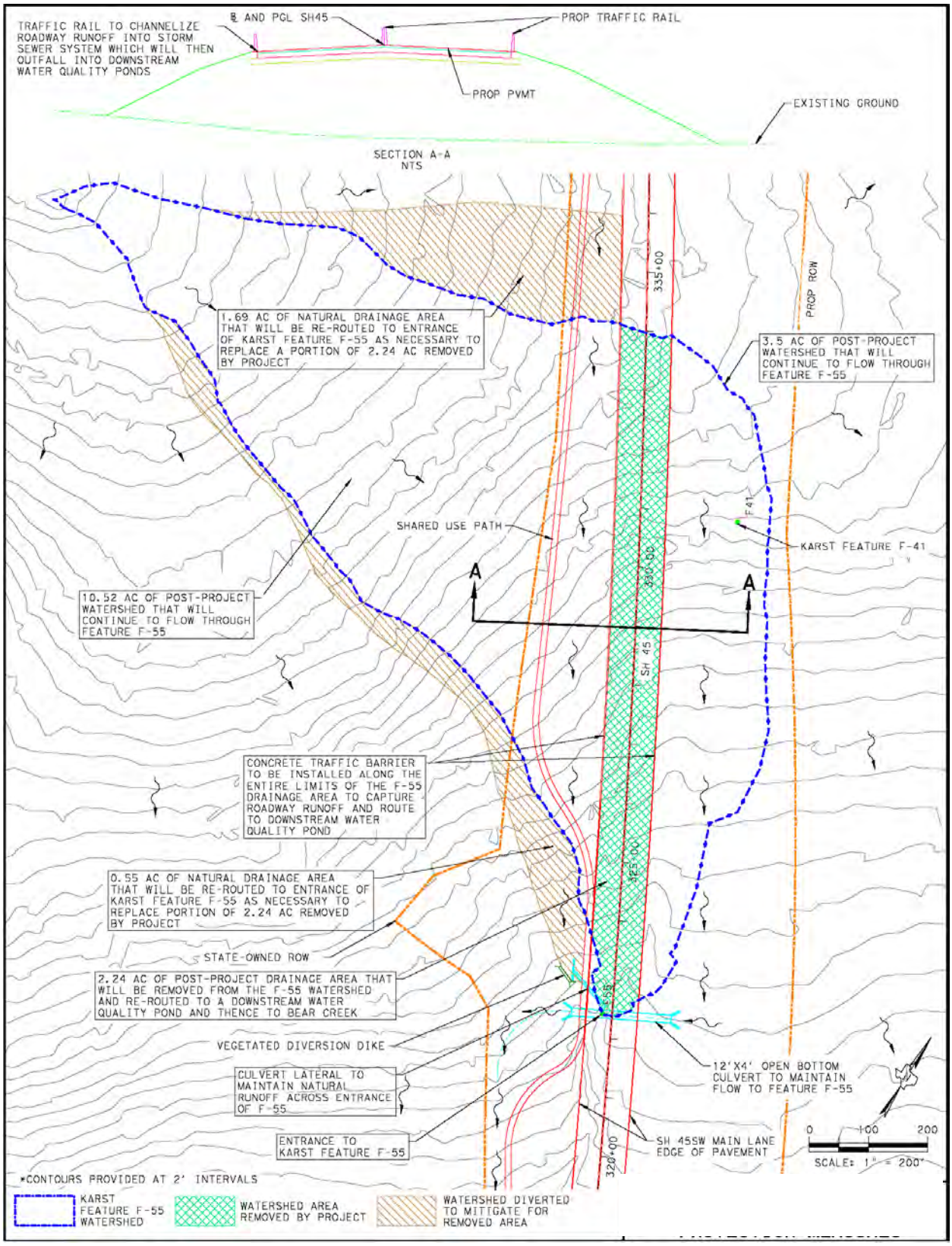
Figure 3.7-8: Feature #55 Protection Measures



Source: RTG, 2014

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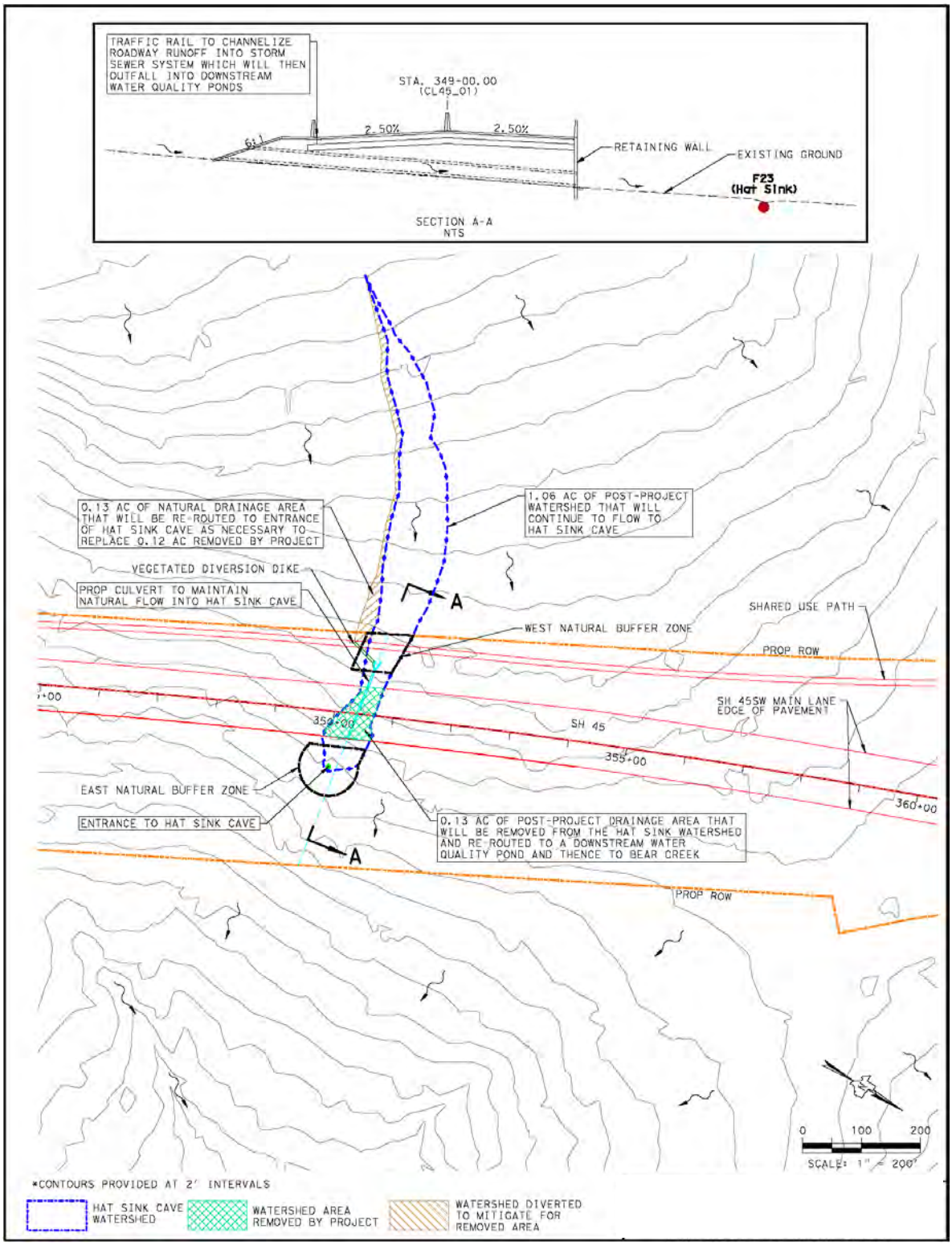
Figure 3.7-9: Feature #23 (Hat Sink Cave) Protection Measures



Source: RTG, 2014

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3.7.4 Encroachment-Alteration Effects

Encroachment-alteration effects to water quality occur primarily due to increased impervious surface area which could result in increased runoff, alter recharge (flow and quality) into the aquifer, and decrease water quality downstream. Construction of the roadway and its associated infrastructure would directly contribute to increases in impervious cover and may indirectly contribute to increases in impervious cover through induced development that may result from the proposed project. Effects would also occur in areas where vegetation in the proposed project area is cleared during construction, which could accelerate off-site erosion due to runoff. Placement of the roadway could encroach on the surface or subsurface drainage areas of adjacent caves/sensitive features, altering the hydrologic regime in those features. Use of BMPs within the proposed project area would minimize water quality effects downstream.

3.8 Ecological Resources

Ecological resources within the SH 45SW ROW have been studied in detail, beginning with a karst terrain feature survey in 2007 (aci, 2007). Preliminary site reconnaissance in support of the preparation of this EIS was conducted in August 2013, followed by detailed investigations in 2014. The results of the investigations are discussed in **Section 3.8.2**. The limits of the study area are consistent with the study area discussed for prior resources and are described at the beginning of **Section 3.0.**

3.8.1 Regulatory Authority

The following state codes and federal environmental regulations apply to the proposed project.

Texas Administrative Code: Texas Department of Transportation – Texas Parks and Wildlife Department Memorandum of Understanding

Transportation Code 201.607 requires TxDOT to adopt a memorandum of understanding (MOU) with each state agency that has responsibilities for the protection of the natural environment or for the preservation of historical or archeological resources, and requires TxDOT and each of the agencies to adopt the memoranda and all revisions by rule.

Texas Administrative Code, Title 43, Chapter 2, Subchapter G contains the MOU between TxDOT and Texas Parks and Wildlife Department (TPWD), effective September 1, 2013. A different MOU ("prior MOU") was in effect when TxDOT began consultation with TPWD. The current MOU mandates that coordination be completed under the procedures of the prior MOU because TxDOT initiated coordination with TPWD before the current MOU's effective date. See 43 TAC § 2.201(e). The prior MOU explained in Section 2.22(d)(2) that coordination was to be conducted under certain circumstances, including but not limited to projects that are

within the range and suitable habitat of any state or federally listed threatened or endangered species.

Because the proposed project would be located within the range of a state threatened or endangered species or Species of Greatest Conservation Need (SGCN), and suitable habitat would be present, TxDOT initiated coordination by mailing TPWD a letter on July 2, 2013 inviting TPWD to be a participating agency in the SH 45SW project (see **Appendix K: Agency Coordination**). During coordination, the agencies determined potential impacts from the proposed project by using information from Texas Conservation Action Plan (TCAP), Ecological Mapping Systems of Texas (EMST), Texas Natural Diversity Database (TXNDD), county lists of Rare and Protected Species of Texas maintained by TPWD, county lists of endangered, threatened, and candidate species maintained by the US Fish and Wildlife Service (USFWS), and the most current aerial photography available.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 states it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, or egg in part or in whole, without a federal permit issued in accordance with the Act's policies and regulations. Nearly all native species of North American birds are protected by the MBTA, regardless of whether or not they are actually migratory.

The original purpose of the MBTA was to protect migratory birds – specifically to end the commercial trade in birds and feathers that was popular in the late 19th and early 20th centuries. The MBTA does not prohibit disturbance or destruction of habitat used by migratory birds. The MBTA is enforced by the USFWS. Violation of the MBTA can result in misdemeanor or felony charges, including fines and imprisonment.

The MBTA does not require a person or entity to consult with the USFWS prior to committing an act in a location occupied by birds protected by the MBTA. Rather, it is incumbent upon the person or entity to ensure its actions are performed in compliance with the provisions of the MBTA. For most projects involving land disturbance, compliance with the MBTA is achieved via seasonal restriction on the clearing of vegetation in order to avoid destruction of active bird nests.

Endangered Species Act of 1973

The Endangered Species Act (ESA), as amended (16 United States Code (USC) 1531-1544), prohibits the take of listed threatened and endangered species and ensures that any actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of any listed endangered or threatened species or adversely modify or destroy critical habitat of such species. An "endangered" species is defined as one that is in danger of

extinction throughout all or a significant portion of its range. A "threatened" species is defined as one that is likely to become endangered in the foreseeable future.

The purpose of the ESA is to conserve threatened and endangered species as well as to establish a process for adding qualified species (and habitat critical to their continued existence) to the official list through a formal rulemaking procedure that includes public input and involvement. The ESA applies to any project that may impact threatened or endangered animal species and/or their associated critical habitat.[5] The ESA defines critical habitat as "a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection." Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery.

Any time a federal action may affect a listed species or its critical habitat, the lead federal agency taking the action must consult with USFWS or National Marine Fisheries Service (NMFS) as appropriate. Proponents of non-federal actions may coordinate with USFWS or NMFS at their discretion. Failure to comply with the ESA can result in civil and criminal penalties. No portion of the study area has been designated by USFWS as critical habitat for a threatened or endangered species.

Section 10 of the ESA allows USFWS to issue permits for the "incidental taking" of protected species. Approval must be obtained prior to conducting any activity that may "take" a threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a threatened or endangered species, or to attempt to engage in any such conduct. A Section 10 incidental take permit allows the holder to take a listed species when the action involved is incidental to, and not the purpose of, an otherwise lawful activity.

The following federal environmental regulation does not apply to the proposed project.

Magnuson-Stevens Fishery Conservation and Management Act

According to the Essential Fish Habitat Mapper maintained by the National Oceanic and Atmospheric Administration (NOAA), no Essential Fish Habitat is present in the study area (NOAA, 2013). Therefore, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) does not apply to the proposed project.

[5] The ESA does not include a take prohibition against listed plant species occurring on private property.

3.8.2 Existing Conditions

Vegetation

Ecoregions

Ecoregions denote areas of general similarity in ecosystems and in the type and quality of environmental resources (EPA, 2004). The study area lies entirely within the Level IV Balcones Canyonlands ecoregion as mapped by the EPA (EPA, 2004). The Balcones Canyonlands ecoregion is a subdivision of the Level III Edwards Plateau ecoregion and occupies the southeastern portion of this larger region. The Edwards Plateau as a whole is a dissected limestone plateau that contains a sparse network of perennial streams and primarily supports vegetation communities characterized by Ashe juniper (*Juniperus ashei*), oak (*Quercus* spp.), and honey mesquite (*Prosopis glandulosa*) (EPA, 2004).

The Balcones Canyonlands ecoregion is highly dissected by erosion from springs, streams, and rivers; supports a variety of endemic plants; and has a higher representation of deciduous woodland than the rest of the Edwards Plateau (EPA, 2004). While mapped within this Level IV ecoregion by the EPA, the study area, which overall is relatively flat, appears to share more characteristics with another Level IV subdivision of the Edwards Plateau, the Edwards Plateau Woodland ecoregion. The Edwards Plateau Woodland ecoregion is less dissected than the Balcones Canyonlands and historically supported savanna grassland with scattered plateau live oak (*Quercus fusiformis*), Texas oak (*Quercus buckleyi*), Ashe juniper, and honey mesquite trees (EPA, 2004). Woody species have become increasingly abundant in this ecoregion as a result of fire suppression and livestock grazing (EPA, 2004).

TPWD Ecological Mapping Systems of Texas (EMST)

The Texas Ecological Systems Classification is a cooperative effort between TPWD and private, state, and federal partners to produce a new land classification map for Texas. The EMST is the product of that partnership. The EMST recently produced a map of vegetation and other land cover that has spatial resolution useful at about 1:24,000 scale (a USGS 7.5' quadrangle), and has a sufficient number of land cover classes (thematic resolution) to provide improved insights for planning and management at a sub-county, or large ownership, scale of resolution. This map was produced by first classifying land cover, and then using ancillary data (e.g. hydrology, environmental data, highways, and cities) to model final mapped vegetation types. TPWD and partner personnel also collected ground data on land cover, composition, ecological system, and mapped vegetation type using a legend developed via an expert committee.

A total of 34 land cover types occur within the SH 45SW study area, according to EMST data available online on TPWD's website. The land cover types were consolidated into the five major land cover types present within the study area, as shown in **Figure 3.8-1**. **Table 3.8-1**

provides the approximate acreage of each of the 34 land cover types present within the study area and the approximate percentage of the study area the land cover type occupies. As indicated in **Table 3.8-1**, 23 of the 34 land cover types each occurs across less than one percent of the study area, while four of the 34 types account for 76.75 percent of the total land cover in the study area. These four cover types are Edwards Plateau: Deciduous Oak/Evergreen Motte and Woodland (33.90 percent), Urban Low Intensity (19.84 percent), Edwards Plateau: Savanna Grassland (12.44 percent), and Edwards Plateau: Live Oak Motte and Woodland (10.57 percent). EMST descriptions of each land cover type (Diamond and Elliott, undated), as modified to apply to Travis and Hays counties, are provided following **Table 3.8-1**. Example photographs of land cover types are provided in **Appendix G: Study Area Photographs**.

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Figure 3.8-1: Texas Parks and Wildlife Ecological Mapping Systems of Texas in Study Area

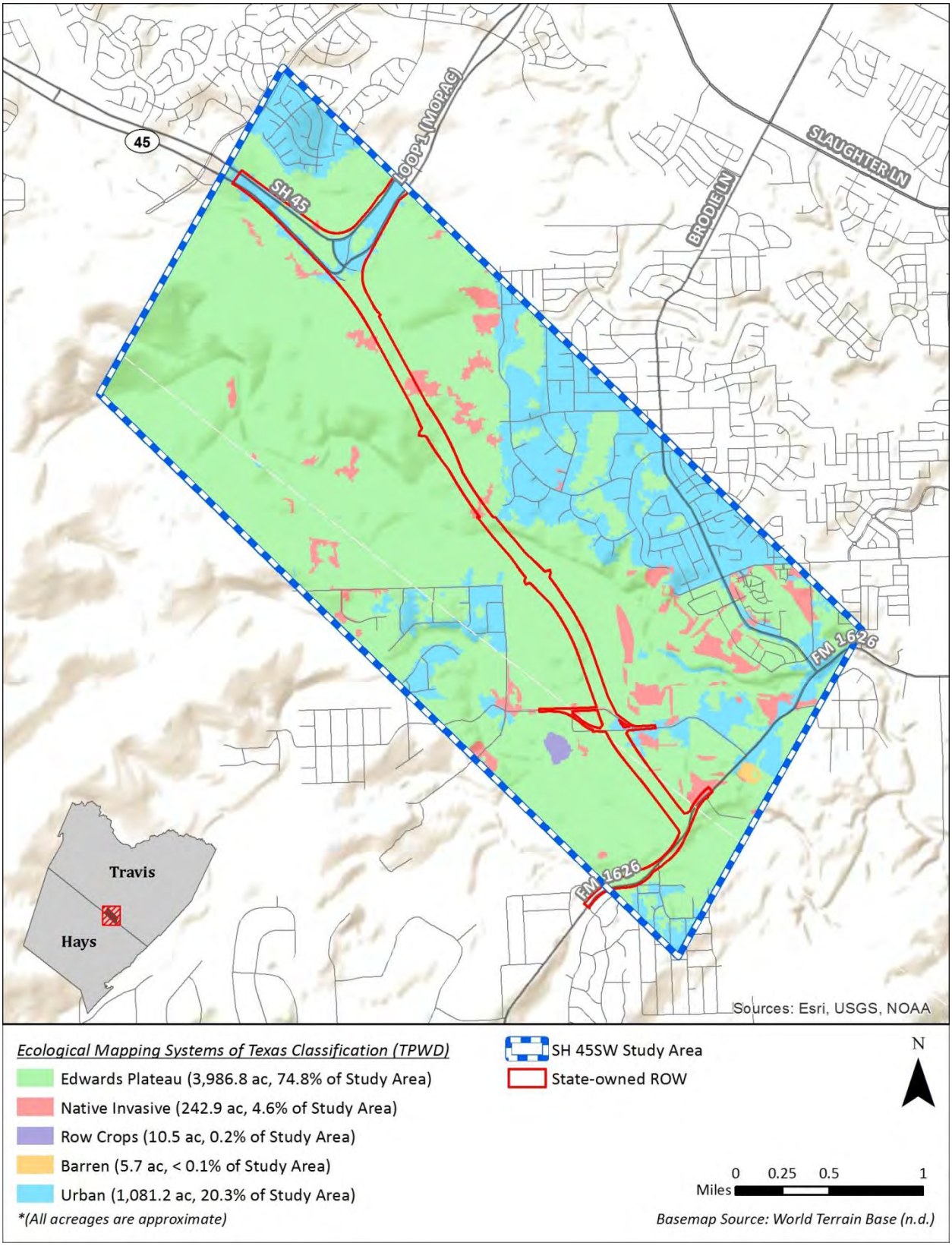

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Table 3.8-1: Vegetation Types in the SH 45SW Study Area

Vegetation Type	Acreage	Percentage of Study Area*
Edwards Plateau: Ashe Juniper Slope Forest	3.4	0.06%
Edwards Plateau: Live Oak Slope Forest	2.4	0.05%
Edwards Plateau: Oak / Ashe Juniper Slope Forest	26.6	0.50%
Edwards Plateau: Oak / Hardwood Slope Forest	3.6	0.07%
Edwards Plateau: Floodplain Ashe Juniper Forest	11.6	0.22%
Edwards Plateau: Floodplain Live Oak Forest	6.8	0.13%
Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest	110.2	2.07%
Edwards Plateau: Floodplain Hardwood Forest	21.6	0.41%
Edwards Plateau: Floodplain Ashe Juniper Shrubland	6.6	0.12%
Edwards Plateau: Floodplain Deciduous Shrubland	2.1	0.04%
Edwards Plateau: Floodplain Herbaceous Vegetation	1.7	0.03%
Edwards Plateau: Ashe Juniper Motte and Woodland	155.4	2.92%
Edwards Plateau: Live Oak Motte and Woodland	562.9	10.57%
Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland	1,805.9	33.90%
Edwards Plateau: Oak / Hardwood Motte and Woodland	131.9	2.48%
Edwards Plateau: Savanna Grassland	662.9	12.44%
Edwards Plateau: Post Oak Motte and Woodland	311.3	5.84%
Edwards Plateau: Ashe Juniper / Live Oak Shrubland	22.2	0.42%
Edwards Plateau: Shin Oak Shrubland	2.3	0.04%
Edwards Plateau: Ashe Juniper / Live Oak Slope Shrubland	0.5	0.01%
Edwards Plateau: Riparian Ashe Juniper Forest	4.6	0.09%
Edwards Plateau: Riparian Live Oak Forest	7.4	0.14%
Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest	104.8	1.97%
Edwards Plateau: Riparian Hardwood Forest	15.6	0.29%
Edwards Plateau: Riparian Deciduous Shrubland	0.9	0.02%
Edwards Plateau: Riparian Herbaceous Vegetation	1.5	0.03%
Barren	5.7	0.11%
Native Invasive: Juniper Woodland	0.1	0.00%
Native Invasive: Deciduous Woodland	63.7	1.20%
Native Invasive: Juniper Shrubland	8.0	0.15%
Native Invasive: Mesquite Shrubland	171.0	3.21%
Row Crops	10.5	0.20%
Urban High Intensity	24.3	0.46%
Urban Low Intensity	1,056.9	19.84%
TOTAL	**5,326.9**	**100.00%**

Source: TPWD, 2013f
** Values have been rounded to the nearest 100th.*

Edwards Plateau: Ashe Juniper Slope Forest

Ashe juniper and plateau live oak are often the dominant species of this mainly evergreen woodland or forest, and other oaks such as Texas oak (*Quercus buckleyi*) and white shin oak (*Quercus sinuata* var *breviloba*) may be important. Ashe juniper is often the dominant understory species, along with species such as Texas persimmon (*Diospyros texana*), Texas mountain-laurel (*Sophora secundiflora*), and fragrant mimosa (*Mimosa borealis*).

Edwards Plateau: Live Oak Slope Forest

Plateau live oak is the most important tree of this mainly evergreen slope woodland or forest, but Ashe juniper and deciduous trees such as Texas oak, white shin oak, cedar elm (*Ulmus crassifolia*), and sugar (or netleaf) hackberry (*Celtis laevigata* or *C. reticulata*) may be important in the overstory. The understory may contain Ashe juniper along with species such as Texas persimmon and Texas mountain-laurel.

Edwards Plateau: Oak/Ashe Juniper Slope Forest

Deciduous oaks such as Texas oak and white shin oak share dominance with Ashe juniper in this mixed woodland or forest. Other deciduous trees such as cedar elm, netleaf hackberry, escarpment black cherry (*Prunus serotina* var. *eximia*), and Arizona walnut (*Juglans major*) may be in the canopy. Understory species may include red buckeye (*Aesculus pavia*), Texas redbud (*Cercis canadensis* var *texensis*), and roughleaf dogwood (*Cornus drummondii*), along with Ashe juniper.

Edwards Plateau: Oak/Hardwood Slope Forest

A fairly wide diversity of deciduous trees such as Texas oak, white shin oak, Texas ash (*Fraxinus texensis*), escarpment black cherry, Arizona walnut, cedar elm, and sugar hackberry may be in the overstory of this mainly deciduous woodland or forest. Plateau live oak is often important in the canopy. The understory may also contain a diversity of woody plants such as elbowbush (*Forestiera pubescens*), roughleaf dogwood, Texas redbud, red buckeye, Mexican buckeye (*Ungnadia speciosa*), Carolina buckthorn (*Frangula caroliniana*), and rusty blackhaw (*Viburnum rufidulum*). Dense deciduous shrublands, such as white shin oak shrubland, may sometimes be mapped as this type.

Edwards Plateau: Floodplain Ashe Juniper Forest

Ashe juniper and plateau live oak are frequent canopy dominants of this primarily disturbance-type woodland or forest.[6]

[6] Diamond and Elliott (undated) do not define a "disturbance-type" woodland. It is assumed this type of woodland develops in areas subject to disturbance by flooding.

Edwards Plateau: Floodplain Live Oak Forest

Plateau live oak is a dominant canopy tree, together with deciduous trees such as cedar elm, sugar hackberry, pecan (*Carya illinoensis*), and Texas ash. Ashe juniper may be present as a tree or understory shrub.

Edwards Plateau: Floodplain Hardwood/Ashe Juniper Forest

Ashe juniper trees or shrubs are a primary component of this mixed forest type. Cedar elm, plateau live oak, pecan, American elm (*Ulmus americana*), sugar hackberry, pecan, bur oak (*Quercus macrocarpa*), and sycamore (*Platanus occidentalis*) may be present.

Edwards Plateau: Floodplain Hardwood Forest

Cedar elm, American elm, pecan, plateau live oak, bur oak, western soapberry (*Sapindus saponaria* var *drummondii*), Arizona walnut, green ash (*Fraxinus pennsylvanica*), and plateau live oak are common components of this broadly-circumscribed, mainly deciduous forest. Understory species may include gum bumelia (*Bumelia lanuginosa*), roughleaf dogwood, red mulberry (*Morus rubra*), Texas persimmon, and possumhaw (*Ilex decidua*).

Edwards Plateau: Floodplain Ashe Juniper Shrubland

Ashe juniper, plateau live oak, and mesquite are frequent components of this mainly disturbance evergreen shrubland.[7]

Edwards Plateau: Floodplain Deciduous Shrubland

This type contains various shrublands, and mesquite, cedar elm, and plateau live oak (scattered trees or shrubs) are common components. Huisache (*Acacia farnesiana*), western soapberry, little walnut (*Juglans microcarpa*), sugar hackberry, Ashe juniper, and common buttonbush (*Cephalanthus occidentalis*) may be components.

Edwards Plateau: Floodplain Herbaceous Vegetation

This mapped type circumscribes various grasslands, including areas dominated by Bermuda grass (*Cynodon dactylon*) or King Ranch bluestem (*Bothriochloa ischaemum* var *songarica*). Native species that may be present, common, or dominant include switchgrass (*Panicum virgatum*), bushy bluestem (*Andropogon glomeratus*), Virginia wildrye (*Elymus virginicus*), Texas wintergrass (*Nassella leucotricha*), little barley (*Hordeum pusillum*), eastern gamagrass (*Tripsacum dactyloides*), and Lindheimer muhly (*Muhlenbergia lindheimeri*). Plateau live oak trees and mesquite trees or shrubs are often components of these grasslands.

[7] Diamond and Elliott (undated) do not define a "disturbance" evergreen shrubland. It is assumed this community develops in areas subject to disturbance by flooding.

Edwards Plateau: Ashe Juniper Motte and Woodland

Ashe juniper and plateau live oak are the most frequent dominants of this evergreen woodland. Some areas are characterized by nearly pure stands of Ashe juniper, while others have taller plateau live oaks with an understory of smaller Ashe juniper. White shin oak may be important in the central and eastern parts of the range. Persimmon and agarito (*Mahonia trifoliolata*) are common shrubs.

Edwards Plateau: Live Oak Motte and Woodland

Plateau live oak dominates this evergreen woodland, and Ashe juniper is the most frequent understory species. Ashe juniper may also appear in the overstory, along with Texas oak, white shin oak, and post oak (*Quercus stellata*). Frequent shrubs include Texas persimmon and agarito.

Edwards Plateau: Deciduous Oak/Evergreen Motte and Woodland

This mixed woodland type contains significant variation, but deciduous oaks such as Texas oak and white shin oak are often important in the overstory, together with Ashe juniper, plateau live oak, cedar elm, or sugar hackberry. The understory often contains Ashe juniper and plateau live oak, and Texas persimmon, agarito, and Texas mountain-laurel are common.

Edwards Plateau: Oak/Hardwood Motte and Woodland

This deciduous woodland or forest may contain a diversity of species in the overstory, including cedar elm, Texas oak, sugar hackberry, post oak, white shin oak, or pecan. Plateau live oak is often an important component, and Ashe juniper may be in the overstory as well as the understory. Some areas of dense white shin oak shrubland and highly productive (especially tame) grassland are mapped as this type.

Edwards Plateau: Savanna Grassland

Grassland condition varies for this mapped type, but many areas contain non-native King Ranch bluestem as an important species, and Bermuda grass is also frequent. Common native grasses include little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), silver bluestem (*Bothriochloa saccharoides*), Texas wintergrass, purple three-awn (*Aristida purpurea*), and common curly mesquite (*Hilaria belangeri*). Trees and shrubs are usually present, and may include plateau live oak, Ashe juniper, mesquite, agarito, or cedar elm. Shrub cover may be dense enough to qualify as shrubland rather than grassland in some areas.

Edwards Plateau: Post Oak Motte and Woodland

Post oak and plateau live oak are often the most important overstory dominants of this mainly deciduous woodland, and cedar elm, blackjack oak (*Quercus marilandica*), Texas oak, and sugar hackberry are often present. Ashe juniper may be in the overstory and understory.

Edwards Plateau: Ashe Juniper/Live Oak Shrubland

Ashe juniper and plateau live oak are the most frequent dominants of this evergreen shrubland. Plateau live oak trees may form a sparse canopy and white shin oak, Texas mountain laurel, and evergreen sumac (*Rhus virens*) may be present. This type is usually mapped on moderate slopes, and is similar to the Native Invasive: Juniper Shrubland where the two occur together, but the latter is mapped on 'better' (deeper, more moist) soils.

Edwards Plateau: Shin Oak Shrubland

White shin oak is the most common dominant of these shrublands, and plateau live oak and Ashe juniper are components. Plateau live oak or Texas oak may form a sparse tree canopy, and mesquite is a common component along with species such as Texas persimmon, elbowbush, netleaf forestiera (*Forestiera reticulata*), Texas redbud, and skunkbush sumac (*Rhus trilobata*). This type is similar to the Edwards Plateau: Shin Oak Slope Shrubland, but is mapped on gentle, rather than steep, slopes.

Edwards Plateau: Ashe Juniper/Live Oak Slope Shrubland

This type is similar to the Edwards Plateau: Ashe Juniper / Live Oak Shrubland but is mapped on slopes greater than 20 percent. Species such as evergreen sumac and Lindheimer's silk-tassel (*Garrya ovata* subsp. *lindheimeri*) are more frequent on this type versus the former.

Edwards Plateau: Riparian Ashe Juniper Forest

Ashe juniper, plateau live oak, and sugar hackberry trees are common dominants of this narrow evergreen woodland along mainly first-order streams.

Edwards Plateau: Riparian Live Oak Forest

Plateau live oak and Ashe juniper are the common canopy dominants of this mainly evergreen forest. Other important species may include sugar hackberry, pecan, Texas oak, cedar elm, and little walnut.

Edwards Plateau: Riparian Hardwood/Ashe Juniper Forest

Ashe juniper and plateau live oak are the frequent dominant trees of this mixed forest, and cedar elm, American sycamore, green ash, and sugar hackberry are common trees.

Edwards Plateau: Riparian Hardwood Forest

This narrow, deciduous forest may contain cedar elm, plateau live oak, Texas oak, sugar hackberry, American sycamore, green ash, pecan, or boxelder (*Acer negundo*) as important

overstory trees. Ashe juniper, elbowbush, Texas persimmon, whitebrush (*Aloysia gratissima*), false-willow (*Baccharis neglecta*), little walnut, or buttonbush may be present in the shrub layer.

Edwards Plateau: Riparian Deciduous Shrubland

A variety of small trees or shrubs such as black willow, sugar hackberry, mesquite, desert willow (*Chilopsis linearis*), false-willow, Texas persimmon, little walnut, or whitebrush may dominate this broadly circumscribed type.

Edwards Plateau: Riparian Herbaceous Vegetation

This is a broadly defined grassland that is often dominated by King Ranch bluestem or Bermuda grass in the modern landscape, and Johnson grass (*Sorghum halepense*) is a common component. Plateau live oak and Ashe juniper trees or shrubs often form a sparse canopy. Important native grasses may include bushy bluestem, switchgrass, southwestern bristelgrass (*Setaria scheelei*), Texas wintergrass, Lindheimer muhly, sideoats grama, curly mesquite, and eastern gamagrass.

Barren

This type includes areas where little or no vegetation cover existed at the time of image data collection. Large areas cleared for development are included, as well as rural roads and buildings and associated clearings in primarily rural areas. Stream beds with exposed gravel or bedrock, rock outcrops, quarries, and year-round fallow fields are also included.

Native Invasive: Juniper Woodland

This is a diverse type mapped throughout Phase 1 wherever junipers dominate woodlands or forests, except on the Cretaceous limestone soils of the Edwards Plateau and Grand Prairie, which are mapped as Edwards Plateau: Ashe Juniper Motte and Woodland. Eastern red cedar (*Juniperus virginiana*) or Ashe juniper may dominate the overstory and also occur in the understory. Common associated species include plateau or coastal live oak (*Quercus virginiana*), sugar hackberry, cedar elm, and post oak.

Native Invasive: Deciduous Woodland

This broadly defined type often has sugar hackberry, cedar elm, or mesquite among the dominants, and post oak or plateau live oak may be important. Eastern redcedar or Ashe juniper may also be present.

Native Invasive: Juniper Shrubland

This type is mapped across Phase 1 where junipers occur on ‘better soils,’ so Eastern redcedar, or Ashe juniper may be dominant. Associated species include coastal or plateau live oak, cedar elm, sugar hackberry, and mesquite.

Native Invasive: Mesquite Shrubland

Mesquite is often the dominant species of this broadly defined type, but may occur in a variety of open woodlands to dense shrublands with a variety of other species such as plateau live oak, Ashe juniper, sugar or netleaf hackberry, cedar elm, lotebush (*Ziziphus obtusifolia*), Texas persimmon, and agarito. Some areas of other deciduous shrubs, such as white shin oak and prairie sumac (*Rhus lanceolata*), may be mapped as this type.

Row Crops

This type includes all cropland where fields are fallow for some portion of the year. Some fields may rotate into and out of cultivation frequently, and year-round cover crops are generally mapped as grassland.

Urban High Intensity

This type consists of built-up areas and wide transportation corridors that are dominated by impervious cover.

Urban Low Intensity

This type includes areas that are built up but not entirely covered by impervious cover, and includes most of the non-industrial areas within cities and towns.

Results of Preliminary and Detailed Site Reconnaissance

Project biologists conducted preliminary site reconnaissance of the study area in August 2013 to determine the nature and extent of vegetative communities present within the study area. The site reconnaissance was limited to vegetation observable from the road as right of entry had not yet been provided. (Rights of entry to state-owned ROW and COA WQPLs were later provided. Results of those field surveys, conducted in state-owned ROW in December 2013, are discussed in **Section 3.8.2** of this document). Based on the results of the reconnaissance, the study area can be divided into two broad categories: developed areas and undeveloped and/or agricultural areas (**Figure 3.8-2**). Developed areas were defined as any areas that have been improved by developments such as residential, commercial, or recreational structures. Undeveloped and/or agricultural areas were defined as any areas that lacked improvements beyond minimal trails to allow for human access into greenbelts or similar areas, or minor improvements for agricultural purposes such as fences, windmills, stock tanks, etc.

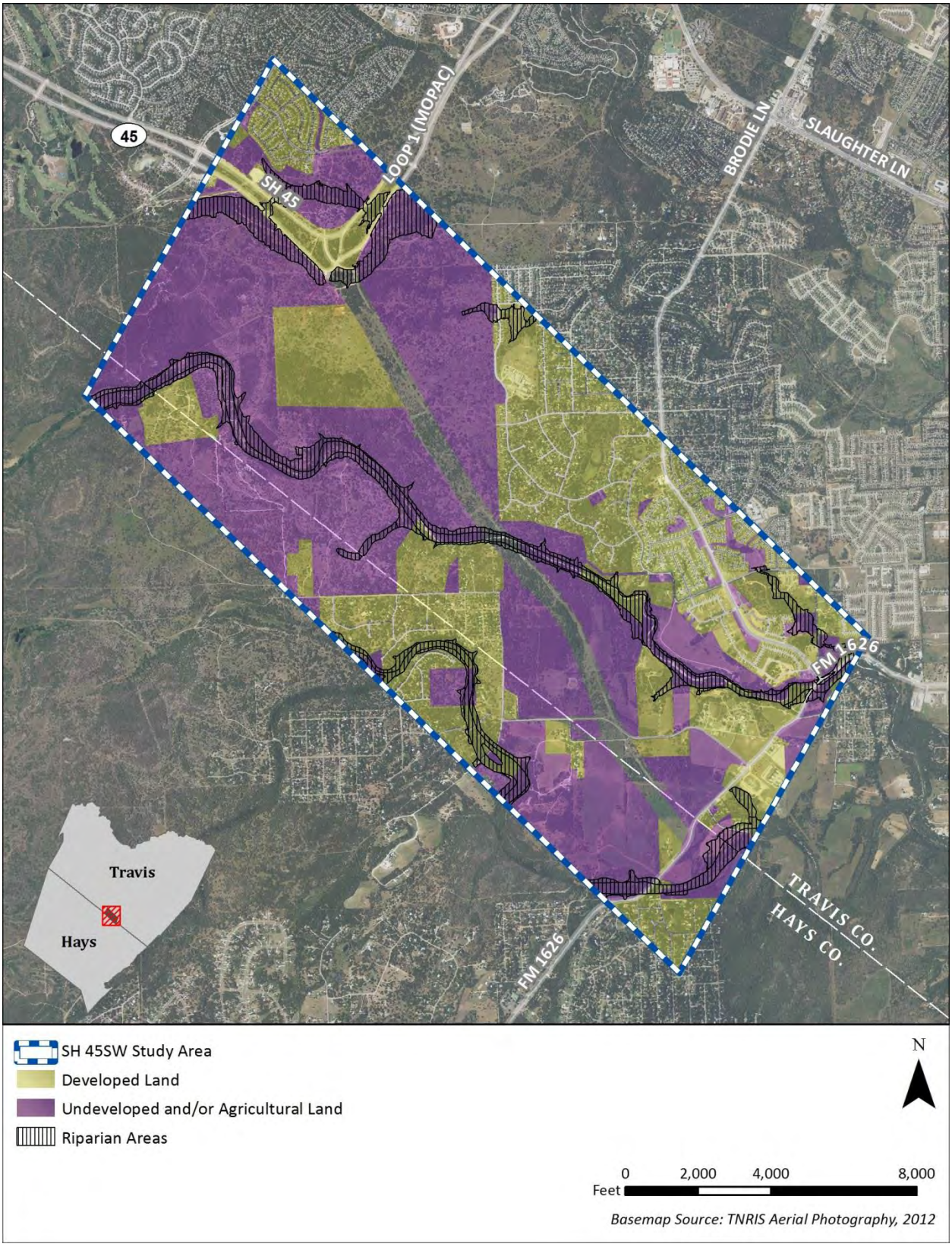
As shown on **Figure 3.8-2**, developed areas are most extensive in the central and southeastern portions of the study area. Most developed areas consist of residential neighborhoods, some of which contain small areas of landscaped parks and undeveloped greenspace, but some high density commercial development and major roads (e.g. MoPac,

existing SH 45, and Brodie Lane) are also present. Developed areas are typified by plants common to commercial and residential landscaping, planted or preserved for aesthetic purposes as well as to provide shade to people and buildings. Common species in these areas include Bermuda grass and plateau live oak trees along with plants common to landscaping such as mountain-laurels and cenizo. Trees present in recently developed areas tend to be less mature than trees present in older developments, though some new developments have integrated existing mature trees into their plans.

Undeveloped and/or agricultural areas are most extensive in the northwestern and south-central portions of the study area. Undeveloped areas consist primarily of COA WQPLs and agricultural land. For reasons of scale, some low density residential and commercial developments were mapped as undeveloped land where undeveloped and vegetated areas make up the majority of the area and structures and improvements are widely spaced.

Undeveloped areas tend to be dominated by Ashe juniper, plateau live oak, mesquite, retama (*Parkinsonia aculeata*), cedar elm, netleaf hackberry, prairie tea (*Croton monanthogynus*), and prickly pear (*Opuntia* sp.), with some Johnson grass and grape vines (*Vitis* sp.) in riparian areas. Grasses in undeveloped areas are typically a mix of native grasses, such as little bluestem, three-awn (*Aristida* spp.), Texas wintergrass, and panicgrass (*Panicum* sp.), along with non-native species such as Bermuda grass. Trees in undeveloped areas appear to be more mature than those occurring in developed areas. Undeveloped areas within WQPLs are discussed in more detail in **Section 3.1** of this document.

Figure 3.8-2: Developed vs. Undeveloped and/or Agricultural (including WQPL) Land Distribution in Study Area



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No signs of oak wilt were observed during the site reconnaissance, although a large oak wilt center is known to occur on a COA WQPL to the east of the SH 45SW ROW (Li and Spillar, 2014). Oak wilt is an affliction affecting oak trees caused by the fungus *Ceratocystis fagacearum*. It is spread from infected trees to adjacent healthy trees through interconnecting roots. It can also be spread by sap beetles carrying fungal spores and by pruning tools that have been used on infected plants. Infected Spanish and red oak trees tend to die within one to four weeks whereas infected live oak trees may die anywhere from one month to two years after infection. There is no cure for oak wilt, though it can be controlled if detected in the early stages and fungicide is applied to affected trees (TxDOT, 2013).

The vegetation observed during the preliminary site reconnaissance was considered generally consistent with communities described for the EPA ecoregions and the TPWD EMST vegetation data for the study area.

In December 2013, project biologists walked the existing state-owned ROW in order to perform a detailed site reconnaissance. Vegetation was observed to be generally composed of juniper-bluestem savannas and oak-juniper woodlands, which is generally consistent with vegetation described for the proposed project area within the TPWD EMST database. Dominant species observed include little bluestem, silver bluestem, broomweed (*Gutierrezia sarothrae*), plateau live oak, and Ashe juniper. Other species observed include: sideoats grama, purple three-awn, switchgrass, bristle grass (*Setaria* sp.), orange wedelia (*Wedelia hispida*), southern dewberry (*Rubus trivialis*), prairie tea, silverleaf nightshade (*Solanum elaeagnifolium*), western ragweed (*Ambrosia psilostachya*), senna (*Cassia* spp.), wine cup (*Callirhoe involucrata*), chile pequin (*Capsicum annuum*), grape vines (*Vitis* sp), Texas prickly pear, horse crippler cactus (*Echinocactus texensis*), grooved nipple cactus (*Coryphantha sulcata*), false-willow, mesquite, Texas persimmon, yaupon holly (*Ilex vomitoria*), possumhaw, agarito, cedar elm, hackberry, eve's necklace (*Sophora affinis*), post oak, and sycamore in riparian areas.

Additional Detailed Studies Within State-Owned Right-of-Way

In addition to the aforementioned site visits, detailed studies were performed within the state-owned ROW as detailed in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* included as **Appendix M: Biological Evaluation and Technical Reports**. These studies and associated technical reports include:

- *State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* (SWCA, 2014);
- *Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (Mopac) to Farm-to-Market 1626, TxDOT ROW, Travis and Hays Counties, Texas* (SWCA and Cambrian Environmental, 2014);

- *Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas* (SWCA and Cambrian Environmental, 2014);
- *Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas* (SWCA and Cambrian Environmental, 2014);
- *Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas* (SWCA and Cambrian Environmental, 2014).

Rare Vegetative Communities

TXNDD does not include any records of rare vegetative communities within the study area (TXNDD, 2013). In addition, no rare vegetative communities were observed within the study area during the site visits.

Wildlife and Fish

The study area is located within the Edwards Plateau ecoregion. This area supports a variety of native wildlife species that have the potential to occur within the study area. Species common to the southern Travis County and northern Hays County area include but are not limited to: white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), Virginia possum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), Texas spiny lizard (*Sceloporus olivaceus*), bullsnake (*Pituophis catinefer sayi*), western diamondback rattlesnake (*Crotalus atrox*), cricket frog (*Acris crepitans*), and bullfrog (*Rana catesbeiana*) (Kutac and Caran, 1994).

A variety of bird species also occur within this area of Texas, many of which are migratory. Some of these species are Northern Mockingbird (*Mimus polyglottos*), Northern Cardinal (*Cardinalis cardinalis*), Blue Jay (*Cyanocitta cristata*), Carolina Wren (*Thryothorus ludovicianus*), Carolina Chickadee (*Poecile carolinensis*), Black-crested Titmouse (*Baeolophus atricristatus*), White-winged Dove (*Zenaida asiatica*), Mourning Dove (*Zenaida macroura*), Inca Dove (*Columbina inca*), House Finch (*Haemorhous mexicanus*), a variety of native sparrows, White-eyed Vireo (*Vireo griseus*), Ruby-crowned Kinglet (*Regulus calendula*), Killdeer (*Charadrius vociferous*), Red-shouldered Hawk (*Buteo lineatus*), Black Vulture (*Coragyps atratus*), and Turkey Vulture (*Cathartes aura*) (TPWD, 2013b).

Fish species common to rivers and streams in central Texas include: Texas shiner (*Notropis amabilis*), golden shiner (*Notemigonus crysoleucas*), blacktail shiner (*Cyprinella venusta*), common carp (*Cyprinus carpio*), fathead minnow (*Pimephales promelas*), green sunfish (*Lepomis cyanellus*), and longear sunfish (*Lepomis megalotis*), among many others

(TPWD, 2013c). See Tables 4 – 6 in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**) for comprehensive lists of wildlife species that are known to occur, or may occur, in the SH 45SW ROW.

Threatened and Endangered Species

According to USFWS, 19 federally endangered, four federally threatened, and six federal candidate species are known to occur or may potentially occur in Travis and Hays counties, or occur in Comal County but have the potential to be adversely impacted by activities occurring in Hays County within the Recharge Zone for the San Antonio segment of the Edwards Aquifer (USFWS, 2015). According to TPWD, 12 state-endangered and 13 state-threatened species occur, could occur, or formerly occurred in Travis and Hays counties (TPWD, 2014). All of these species are identified in **Table 3.8-3** along with information concerning the potential for each species to occur in the study area used for the threatened and endangered (T&E) species assessment as presented in **Figure 3.8-3**. The number of federally listed endangered species identified in **Table 3.8-3** (21 species) is greater than the number of federally listed endangered species identified by USFWS as having the potential to occur in Travis and Hays counties because the table also includes federally listed endangered species identified by TPWD as having the potential to occur in, or having formerly occurred in, this two-county area. All species that are known to occur, or are considered to have the potential to occur, within the study area are discussed in detail following **Table 3.8-2**.

As identified in **Table 3.8-2**, several of the listed species from Travis County are cave-dwelling (karst) invertebrates known only from locations north of the Colorado River and many of the listed species from Hays and Comal counties are aquatic species that occur in habitats that are hydrologically isolated from the study area.

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Figure 3.8-3: Karst Zones in Study Area

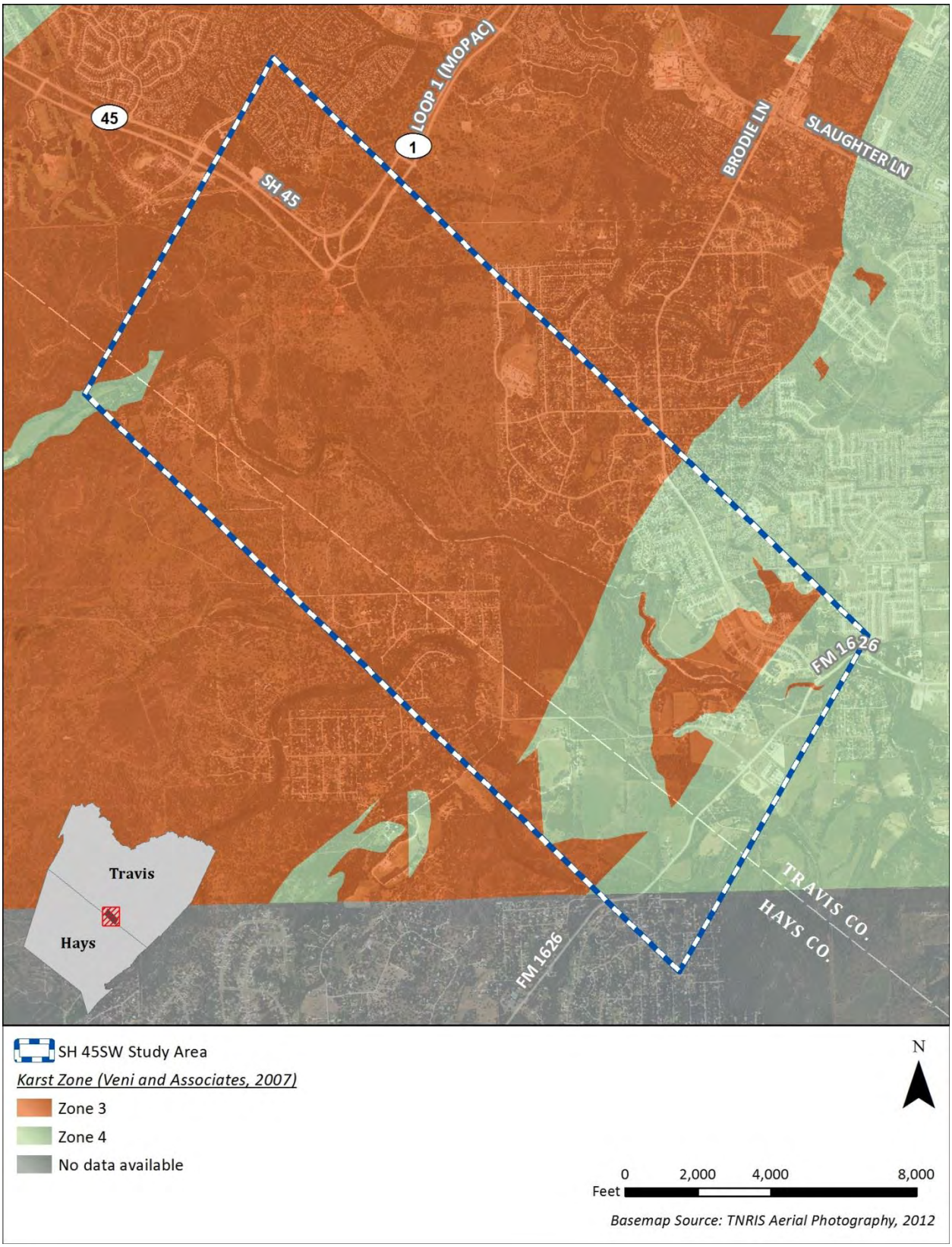

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Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Amphibians					
Austin blind salamander	*Eurycea waterlooensis*	E	--	Restricted to subterranean cavities of the Edwards Aquifer; only definitively known from the outlets of Barton Springs; potentially occurs in other spring outlets or subterranean aquatic habitat.	Uncertain – only definitively known from the outlets of Barton Springs, which do not lie within the study area; may occur more extensively in subterranean aquatic habitat; groundwater from the study area reaches Barton Springs through creeks and recharge features.
Barton Springs salamander	*Eurycea sosorum*	E	E	Known from the outlets of Barton Springs, possibly other springs in the Barton Springs segment of the Edwards Aquifer, and subterranean water-filled caverns; found under rocks, in gravel, or among vascular plants and algae.	No – no known springs or subterranean, water-filled caverns known to harbor the species within the study area; groundwater from the study area reaches Barton Springs through creeks and recharge features.
Blanco blind salamander	*Eurycea robusta*	--	T	Water-filled subterranean caverns; has only been found in the Balcones Aquifer near the Blanco River.	No – study area does not overlap this species' range. This species will not be addressed further in this document.
Jollyville Plateau salamander	*Eurycea tonkawae*	T	--	Known from springs and waters of some caves north of the Colorado River in the area of the Jollyville Plateau.	No – study area does not overlap this species' range. This species will not be addressed further in this document.
San Marcos salamander	*Eurycea nana*	T	T	Known in the headwaters of the San Marcos River in watershed of San Antonio segment of Edwards Aquifer; water over gravelly substrate characterized by dense algal mats.	No – study area does not overlap this species' range, nor does it provide recharge to San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Texas blind salamander	*Eurycea rathbuni*	E	E	Water-filled subterranean caverns of San Antonio segment of Edwards Aquifer along a six-mile stretch of the San Marcos Springs Fault in the vicinity of San Marcos.	No – study area does not overlap this species' range, nor does it provide recharge to San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document.
Arachnids					
Bee Creek Cave harvestman	*Texella reddelli*	E	--	Known from caves and talus in Travis and Burnet counties.	No – based on best available information (aci, 2007; USFWS, 2009a; **Appendix M: Biological Evaluation and Technical Reports**), this species is not known to occur within the state-owned ROW.
Bone Cave harvestman	*Texella reyesi*	E	--	Endemic to caves north of the Colorado River in Travis and Williamson counties.	No – study area is outside the range of this species.
Tooth Cave pseudoscorpion	*Tartarocreagris texana*	E	--	Known from small limestone caves of the Edwards Plateau in Travis County north of the Colorado River.	No – study area is outside the range of this species. This species will not be addressed further in this document.
Tooth Cave spider	*Neoleptoneta myopica*	E	--	Cave adapted spider known only from caves in Travis County north of the Colorado River.	No – study area is outside the range of this species. This species will not be addressed further in this document.
Birds					
American Peregrine Falcon	*Falco peregrinus anatum*	--	T	Not known to nest in Travis or Hays counties; migrant across state; winters along coast and farther south; occupies wide range of habitats, including urban areas; stopovers at lake shores, coastlines, and barrier islands.	Yes – possible incidental migrant through study area. However, there are no resources in the study area that are used by this species; therefore; this species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Bald Eagle	*Haliaeetus leucocephalus*	--	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water.	No – possible incidental migrant through area; no appropriate breeding or wintering habitat. This species will not be addressed further in this document.
Black-capped Vireo	*Vireo atricapilla*	E	E	Requires broad-leaved shrublands, usually containing oak or sumac, with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground for nest cover.	Doubtful – no habitat in state-owned ROW. No Black-capped Vireos found in the state-owned ROW during a survey conducted in accordance with USFWS survey protocols in the spring of 2014.. Species has not been found in study area during surveys conducted on COA WQPLs. The TXNDD, Hays County Habitat Conservation Plan (RHCP), and the Balcones Canyonlands Conservation Plan (BCCP) do not indicate habitat for this species within the study area.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Golden-cheeked Warbler	*Setophaga chrysoparia*	E	E	Requires oak-juniper woodlands, usually with a closed or nearly closed canopy; dependent on Ashe juniper (aka cedar) for long, fine bark strips only available from mature trees, used in nest construction; nests in a variety of trees and only requires a few mature junipers for nesting materials.	Yes – oak-juniper woodlands occur within the study area. Surveys conducted on COA WQPLs within the study area have documented irregular occurrence of birds. Golden-cheeked Warbler habitat assessment and presence/absence survey were conducted within the state-owned ROW in the spring of 2014. Presence/absence survey was conducted in accordance with USFWS protocols. No birds were detected in or adjacent to the state-owned ROW in 2014; no habitat known to be used by Golden-cheeked Warblers in the state-owned ROW (**Appendix M: Biological Evaluation and Technical Reports**).
Interior Least Tern	*Sterna antillarum athalassos*	E	E	Nests along sand and gravel bars within braided streams and rivers; also known to nest at constructed habitats (inland beaches, wastewater treatment plants, etc.).	No – possible incidental migrant over the area; no appropriate stopover habitat. This species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Piping Plover	*Charadrius melodus*	T	--	Does not nest or winter in Travis or Hays counties. Potential migrant in region, where it occurs on beaches and mudflats in association with aquatic habitats.	No – possible incidental migrant over the area; no appropriate stopover habitat. This species will not be addressed further in this document.
Red Knot	*Calidris canutus*	T	--	Does not nest or winter in Travis or Hays counties. Potential migrant in region, where it occurs on beaches and mudflats in association with aquatic habitats.	No – possible incidental migrant over the area; no appropriate stopover habitat. This species will not be addressed further in this document.
Whooping Crane	*Grus americana*	E	E	Potential migrant across the central part of the state to/from the coast; stopover habitat includes lakes, ponds, and marshes; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	No – possible incidental migrant over the area; no appropriate stopover habitat. This species will not be addressed further in this document.
Zone-tailed Hawk	*Buteo albonotatus*	--	T	Arid, open country including mountains of west Texas and Hill Country of Edwards Plateau; often found near water courses; nests in sites ranging from small trees in lower desert, giant cottonwoods in riparian areas, and mature conifers in high mountain regions.	No – not known nor expected to nest or winter regularly in study area. Possible incidental migrant and very occasional winter visitor through area. No resources in the study area used regularly by this species so this species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Crustaceans					
Peck's cave amphipod	*Stygobromus pecki*	E	--	Exclusively inhabits subterranean aquatic habitat of San Antonio segment of Edwards Aquifer. Only known to occur near Comal and Hueco Springs.	No – Comal and Hueco Springs do not fall within the study area. Study area does not provide recharge to San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document.
Fish					
Fountain darter	*Etheostoma fonticola*	E	E	Known only in the San Marcos and Comal Rivers in watershed of San Antonio segment of Edwards Aquifer; springs and spring-fed streams in dense beds of aquatic plants growing close to the bottom.	No – study area does not include the San Marcos or Comal River, nor does it provide recharge to San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document.
San Marcos gambusia	*Gambusia georgei*	E	E	Thought to be extinct; formerly known from the upper San Marcos River; restricted to shallow, quiet, mud-bottomed shoreline areas without dense vegetation in thermally constant main channel.	No – most likely extinct. Study area does not extend into the San Marcos River. This species will not be addressed further in this document.
Smalleye shiner	*Notropis buccula*	E	--	Endemic to upper Brazos River system and its tributaries; may have been introduced to Colorado River system; medium to large prairie streams with sandy substrate and turbid to clear warm water.	No – study area outside native range of the species; no appropriate riverine habitat in the study area. This species will not be addressed further in this document.
Insects					
Comal Springs dryopid beetle	*Stygoparnus comalensis*	E	E	Only known from in outlets of Comal Springs which discharges San Antonio segment of Edwards Aquifer and feeds the Comal River; generally found clinging to objects in a stream; sometimes found crawling on stream bottoms or along shores.	No – study area does not include the Comal River, nor does it recharge the San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Comal Springs riffle beetle	*Heterelmis comalensis*	E	E	Known in Comal and San Marcos Springs, which discharge San Antonio segment of Edwards Aquifer; gravel substrates and riffles in spring runs; may be able to retreat back into spring opening or burrow down to wet areas below surface of streambed.	No – study area does not include Comal or San Marcos Springs, nor does it recharge San Antonio segment of Edwards Aquifer. This species will not be addressed further in this document..
Kretschmarr Cave mold beetle	*Texamaurops reddelli*	E	--	Occurs in very small, isolated caves within in the Edwards Limestone Formation on the Jollyville Plateau in Travis County north of the Colorado River; only found under rocks lightly buried in silt in total darkness.	No – study area is outside the range of this species. This species will not be addressed further in this document.
Tooth Cave ground beetle	*Rhadine persephone*	E	--	Known only from small isolated karst caves within the Edwards Limestone Formation of Travis and Williamson counties north of the Colorado River; prefers areas with deep compacted silt.	No – study area is outside the range of this species. This species will not be addressed further in this document.
Mammals					
Red wolf	*Canis rufus*	E	E	Extirpated from the wild in Texas; formerly known throughout the eastern half of Texas in brushy and forested areas as well as coastal prairies.	No – This species will not be addressed further in this document.
Mollusks (Freshwater Mussels)					
False spike mussel	*Quadrula mitchelli*	--	T	Possibly extirpated in Texas; medium to large rivers; substrates varying from mud through mixtures of sand, gravel, and cobble; Rio Grande, Brazos, Colorado, and Guadalupe (historic) River Basins.	No – Bear Creek is too small; surveys conducted by Cordova et al (2013) were negative. Bear Creek was found to be dry during the winter of 2012.
Golden orb	*Quadrula aurea*	C	T	Found in the Guadalupe, San Antonio, Lower San Marcos, and Nueces River Basins; sand and gravel substrates in some locations and mud in others; found in lentic and lotic areas.	No – study area is in Colorado River watershed, outside the range of this species. This species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Smooth pimpleback	*Quadrula houstonensis*	C	T	Found in small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel substrates; tolerates very slow to moderate flow rates; lower Trinity (questionable), Brazos, and Colorado River Basins.	No – not known from Bear Creek (USFWS, 2011); surveys conducted by Cordova et al (2013) were negative.
Texas fatmucket	*Lampsilis bracteata*	C	T	Colorado and Guadalupe River Basins; streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and coarse gravel or sand in moderately flowing water.	No – not known from Bear Creek (USFWS, 2011); surveys conducted by Cordova et al (2013) were negative.
Texas fawnsfoot	*Truncilla macrodon*	C	T	Little known; possible rivers and larger streams; likely tolerant of impoundments; broken bedrock and coarse gravel or sand in moderately flowing water; Colorado and Guadalupe River Basins.	No – not known from Bear Creek (USFWS, 2011); surveys conducted by Cordova et al (2013) were negative.
Texas pimpleback	*Quadrula petrina*	C	T	Colorado and Guadalupe River Basins; mud, gravel, and sand substrates; generally in areas with slow flow rates.	No – There is no perennial stream in the study area; surveys conducted by Cordova et al (2013) were negative.
Plants					
Bracted twistflower	*Streptanthus bracteatus*	C	--	Oak-juniper woodlands and associated openings on slopes and in canyon bottoms with shallow, well drained, gravelly clays and clay loams over limestone. The bracted twistflower is often found amid dense shrub growth where some protection from browsing animals is afforded.	No – The geology and topography of the state-owned ROW do not match the geology and topography present in areas where this species is known to occur, and most vegetation within the ROW does not have the structure typically associated with species occurrence (TxDOT et al., 2014). This species will not be addressed further in this document.

Table 3.8-2: Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Study Area
Texas wild-rice	*Zizania texana*	E	E	Endemic to upper reach of the San Marcos River as fed by discharge from San Marcos Springs; clear, cool, swift water mostly less than one meter deep; coarse, sandy soils rather than finer clays.	No –only known from the San Marcos River (TPWD, 2013d), which is outside the study area. This species will not be addressed further in this document.
Reptiles					
Cagle's map turtle	*Graptemys caglei*	--	T	Endemic to Guadalupe River system; shallow waters with swift to moderate flow and gravel or cobble bottom, connected by deeper pools with a slower flow rate and a silt or mud bottom.	No – study area is outside the Guadalupe River system. This species will not be addressed further in this document.
Texas horned lizard	*Phrynosoma cornutum*	--	T	Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows in soil, enters rodent burrows, or hides under rocks when inactive.	Yes – open, semi-arid, sparsely vegetated areas are present within the study area.

Statuses: E – Endangered; T – Threatened; C – Candidate; DL - Delisted
Source: USFWS, 2013c and 2015; TPWD,2014.

Evaluation of the USFWS Critical Habitat Portal indicates that no critical habitat for any listed species occurs in the study area. A desktop review of suitable habitat was conducted for each federally and state listed species in Travis and Hays counties. A review of the TXNDD was also conducted. A windshield survey of vegetation within the study area was conducted in August 2013 and field surveys for habitat of terrestrial and avian species were conducted within the state-owned ROW in December 2013. A presence/absence survey for Golden-cheeked Warblers (*Setophaga chrysoparia*) and Black-capped Vireos (*Vireo atricapilla*) was conducted in the state-owned ROW in accordance with USFWS survey protocols in the spring of 2014. No birds of either species were found during the survey.

Based on the information provided in **Table 3.8-2**, those species warranting further discussion relative to the proposed project include Austin blind and Barton Springs salamanders, Bee Creek Cave and Bone Cave harvestmen, Black-capped Vireo, Golden-cheeked Warbler, the freshwater mussels, and Texas horned lizard. Discussion of each of these species relative to the proposed project is provided below.

Austin Blind Salamander; Federally Listed Endangered

The **Austin blind salamander** (*Eurycea waterlooensis*) is a neotenic species of salamander, meaning that it does not metamorphose into a final terrestrial form. This species retains external feathery gills and inhabits subterranean aquatic habitat throughout its life (Chippindale et al. 2000). Austin blind salamanders respire through gills and permeable skin, and are notable for their lack of external eyes and lungs. The species has been collected only at three of four spring outlets collectively referred to as Barton Springs in the city of Austin, Travis County, approximately nine to ten miles northeast of the state-owned ROW. Based on morphologic characters typical of subterranean existence such as absence of eyes and weak pigmentation, the primary habitat for this species is believed to be underground aquatic habitats of the Barton Springs segment of the Edwards Aquifer. As such, this species does not have potential to occur in the surface of the study area. Extent of occupation of the aquifer by this species is unknown. Flint Ridge Cave, which occurs in immediate proximity to the state-owned ROW, contains a water passage at its base approximately 152 feet below the surface (Elliott 1997). Biological surveys have been conducted in Flint Ridge Cave on numerous occasions and no *Eurycea* salamanders have been reported as having been detected there (Elliott 1997, Hauwert et al. 2011, Travis County and City of Austin 2011, 2012, 2013). This suggests the species may not occur in the sub-grade of the study area.

Austin blind salamander is considered highly dependent on water quality within the aquifer as it is believed to be tolerant of a narrow range of environmental conditions such as water temperature, pH, alkalinity, etc. (USFWS, 2013a). Water recharging the aquifer from the study area travels to Barton Springs, and so activities occurring in the study area that have ability to alter the quantity or quality of water recharging the aquifer have potential to influence habitat used by this species. Those portions of the study area located within the Recharge Zone for the Barton Springs segment of the Edwards Aquifer are largely coincident with those areas identified as Zone 3 on **Figure 3.8-3**). **Section 3.6** has a comprehensive discussion of the expected effects of the proposed project on the quality and quantity of groundwater within the Barton Springs segment of the Edwards Aquifer. No direct impacts to this species are expected from the proposed project because it does not occur on the surface in the study area. Potential indirect impacts to this species are discussed in **Appendix D: *Indirect Impacts Technical Report*** and in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* included as **Appendix M: Biological Evaluation and Technical Reports**.

Barton Springs Salamander; State and Federally Listed Endangered

The **Barton Springs salamander** (*Eurycea sosorum*) is only known from spring outlets in Barton Springs. In 2009, one individual of the species was reported at a site approximately 6.5 miles southwest of Barton Springs, though this sighting has not yet been confirmed by USFWS (TXNDD, 2013). Emerging research on the phylogeography of Texas *Eurycea* species indicated that several other locations may be occupied by the Barton Springs salamander

(Chippindale, 2014), including two that are within two miles of the project area. As Chippindale 2014 notes, "given the available evidence, it seems most appropriate to consider salamanders at Barton Springs, Cold Spring, and Blowing Sink *E. sosorum*, and those at Spillar Ranch Spring and Taylor Springs this species too (although follow-up studies that verify nuclear sequences alleles and, ideally, add more loci are desirable for the latter two populations)." The taxonomic identity of the salamanders in these observations discussed above has yet to be conclusively determined. Therefore, discussion involving the Barton Springs salamander in this document will focus exclusively on the species as it exists within Barton Springs. It appears that this species occurs primarily in non-subterranean waters, usually under rocks or gravel near spring outlets. Like the Austin blind salamander, this species is highly dependent on the water quality of Barton Springs.

No spring habitat suitable for Barton Springs salamander is present within the study area (SWCA and Cambrian Environmental, 2014d). Therefore, this species is not expected to occur within the study area and no direct impacts to the species are expected from the proposed project. As discussed for Austin blind salamander, activities occurring in the study area that have ability to alter the quantity or quality of water recharging the aquifer have potential to influence habitat used by this species. **Section 3.6** has a comprehensive discussion of the expected effects of the proposed project on the quality and quantity of groundwater within the Barton Springs segment of the Edwards Aquifer. The potential for the proposed project to indirectly impact this species is discussed in **Appendix D: *Indirect Impacts Technical Report*** and in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* included as **Appendix M: Biological Evaluation and Technical Reports**.

Karst Invertebrate Species; Federally Listed Endangered

Most of the state-owned ROW and much of the study area lies within areas that have been mapped by Veni as a Zone 3 karst zone (**see Figure 3.8-3**) within the South Travis County karst fauna region, meaning the areas probably do not contain listed endangered cave fauna but are known to contain rare cave fauna (Veni, 2007). All of the listed endangered karst invertebrates of Travis County except the **Bee Creek Cave harvestman** (*Texella redelli*) were known exclusively from sites occurring north of the Colorado River at the time aci (2007) conducted its survey of the state-owned ROW for karst features (which was performed to assist in compliance with the TCEQ Edwards Aquifer Rules). Veni (2007) indicated that Barton Creek, which lies approximately six miles north of the study area, is "almost certainly recognized as the southern limit for the distribution of the listed species."

Subsequent to the 2007 survey, the USFWS published a 5-year review of the endangered **Bone Cave harvestman** (*Texella reyesi*), which identified the species as occurring in a cave located on City of Austin land to the west of the SH 45SW ROW (USFWS, 2009b). The specimen prompting Bone Cave harvestman to be identified by the USFWS as occurring in this cave had been known for some time and its validity had been questioned by Veni and

others (Veni, 2007). Nonetheless, the identification of Bone Cave harvestman by the USFWS in a cave located south of the Colorado River and in general proximity to the state-owned ROW required TxDOT to consider the potential for construction of SH 45SW to adversely impact this species.[8] Consequently, a survey for karst features (caves, sinkholes, etc.) was again performed within the state-owned ROW in 2014 by SWCA and Cambrian Environmental (*Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas* in **Appendix M: Biological Evaluation and Technical Reports**). The 2014 survey was performed to address the potential for surface conditions in the ROW to have changed since the 2007 survey and as the first step in the USFWS endangered karst invertebrate due diligence process, which is to determine whether listed invertebrates occur in a project area and whether any additional steps are necessary to address possible impacts to these species. It also incorporated a somewhat larger survey area than did the 2007 survey to include land contemplated to be used for connection of SH 45SW to MoPac.

More than 220 individual landscape features were investigated in 2014 as potential recharge features (SWCA and Cambrian Environmental, 2014). An intensive period of excavation resulted in non-karst designation for approximately 90 percent of the features investigated. Twenty-seven features were determined to be of karst origin and included 17 sensitive features: five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge. Some of these features were determined to be fault-related. The remaining 10 were non-sensitive features. Consistent with the known ranges of the listed karst species, biological investigation of the karst features, which included direct sampling in humanly accessible features and use of bait traps in otherwise inaccessible void space, found within and adjacent to the state-owned ROW indicates that no listed endangered or threatened karst invertebrates occur in the project area (**Appendix M: Biological Evaluation and Technical Reports**). This is discussed further in **Section 3.8.3**. For this reason, no additional steps in the endangered karst invertebrate due diligence process are necessary.

Black-capped Vireo: State and Federally Listed Endangered

The **Black-capped Vireo** (*Vireo atricapilla*) prefers broad-leaved shrublands with a distinctive patchy, two-layered aspect with shrubs and trees mixed with open, grassy spaces, and with shrubby foliage reaching to ground level for nesting cover. The species composition is less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure, although in Travis and Hays counties, shrublands occupied by the species often are dominated by white shin oak or evergreen sumac. Deciduous and broad-leaved shrubs and trees provide insects for feeding; the nesting season is March through late summer

[8] It has since been determined that the *Texella* specimen collected from this cave is not *T. reyesi* (Ubick, 2014).

(TPWD, 2013). In Travis and Hays counties, the species is restricted in occurrence to the Edwards Plateau.

Based on the results of the preliminary August 2013 windshield survey and habitat assessments of the state-owned ROW in December 2013 and spring of 2014, no suitable habitat for the Black-capped Vireo occurs in the state-owned ROW. While no suitable habitat for this species was considered present in the ROW, the 2014 Golden-cheeked Warbler survey of the state-owned ROW was timed to also qualify as a survey for the Black-capped Vireo.[9] No Black-capped Vireos were detected in or adjacent to the ROW during this survey (**Appendix M: Biological Evaluation and Technical Reports**).

TXNDD does not indicate the presence of Black-capped Vireos within the study area (TXNDD, 2013). Neither the Balcones Canyonlands Conservation Plan (BCCP) (COA and Travis County, 1996) nor the Hays County Regional Habitat Conservation Plan (RHCP) (Hays County, 2010) identify potential Black-capped Vireo habitat as occurring within the study area. Environmental Assessments conducted for portions of FM 1626 that fall within the SH 45SW study area also did not identify any potential Black-capped Vireo habitat within their project areas (FHWA & TxDOT, 2011; Hicks & Company, 2013). Bird surveys conducted on behalf of the COA on WQPL within the study area have not resulted in the identification of any Black-capped Vireos on those lands, although the species has been recorded intermittently on COA WQPL to the southwest of the study area (SWCA, 2013). As the COA WQPL make up the bulk of undeveloped lands within the study area, it seems most likely that Black-capped Vireos do not occur regularly in this area. However, it cannot be ruled out conclusively that suitable habitat for the species is not present on privately held undeveloped land within the study area.

Golden-cheeked Warbler; State and Federally Listed Endangered

The **Golden-cheeked Warbler** (*Setophaga chrysoparia*) occurs in oak-juniper woodlands, usually with a closed or nearly closed canopy. It is dependent on Ashe juniper for nest material, using long, fine bark strips which are only available from mature trees. The nests are placed in Ashe juniper and other various trees. Golden-cheeked Warblers forage for insects in broad-leaved trees and shrubs and nest in late March-early summer (TPWD, 1990; TPWD, 2014). In Travis and Hays counties, the species is restricted in occurrence to the Edwards Plateau.

The state-owned ROW contains stands of oak-juniper woodland that share some characteristics of Golden-cheeked Warbler habitat. All oak- and juniper-bearing woodlands occurring in the state-owned ROW were surveyed for the Golden-cheeked Warbler by SWCA in

[9] The level of effort prescribed by the USFWS for Black-capped Vireo presence/absence surveys is identical to that prescribed for the Golden-cheeked Warbler so the two can be surveyed for at the same time during the period of 10 April – 1 June.

the spring of 2014. The survey was conducted in accordance with USFWS presence/absence survey protocols for the species. The survey was extended to adjacent woodlands occurring outside, but within 300 feet of, the ROW, with the off-site area surveyed from the ROW boundary fence lines. No Golden-cheeked Warblers were detected in the state-owned ROW by SWCA in 2014 (see *State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* in **Appendix M: Biological Evaluation and Technical Reports**).

COA biologists also conducted a Golden-cheeked Warbler survey in the spring of 2014 on lands owned by the COA occurring within 300 feet of the state-owned ROW. COA biologists also did not detect Golden-cheeked Warblers on lands adjacent to the ROW during 2014 surveys (K. Thuesen/COA, personal communication, June 5, 2014).

Surveys conducted on behalf of the COA on its WQPL indicate the Golden-cheeked Warbler occurs irregularly on COA-owned lands within the study area (SWCA, 2013). Golden-cheeked Warblers have been detected intermittently in two general locations several hundred feet or more to the west of the state-owned ROW, and in one (in 2013) out of seven years directly east of the ROW. All warblers have occurred in woodlands developed on slopes leading down to Bear Creek (SWCA, 2013). No Golden-cheeked Warblers have been reported as being detected in the state-owned ROW incidental to any of the surveys conducted on behalf of the COA (SWCA, 2013).[10]

Texas A&M University used a model (Texas A&M, 2010a) to estimate the amount of Golden-cheeked Warbler habitat present in Texas. Based on a review of the results of this model, as well as a review of recent aerial photography and survey observations, approximately 2,010 acres of potential Golden-cheeked Warbler habitat occur within the study area, some of which occurs within the boundaries of the state-owned ROW. However, the results of surveys performed in the ROW and on COA WQPL indicate that Golden-cheeked Warblers do not occur regularly in the study area in much of the woodland identified as potential Golden-cheeked Warbler habitat by the Texas A&M model. All field surveys performed to date have failed to result in detection of Golden-cheeked Warblers within the state-owned ROW.

No evidence exists to demonstrate usage of woodlands in the state-owned ROW by Golden-cheeked Warblers. For more information, please refer to the *State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* and the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* included in **Appendix M: Biological Evaluation and Technical Reports**. The potential for the proposed project to directly impact Golden-cheeked Warblers is discussed in **Section 3.8.3**. The potential for the proposed project

[10] SWCA conducted the 2013 survey of COA lands. While conducting this survey, SWCA surveyors regularly walked a transmission line corridor that separates woodland on COA land from woodland in the state-owned ROW and so had opportunity to detect Golden-cheeked Warblers in some portions of the state-owned ROW, including all woodland developed in the ROW on slopes adjacent to Bear Creek (SWCA, 2014).

to indirectly impact the species is discussed in **Appendix D: *Indirect Impacts Technical Report***.

Freshwater Mussels; State Listed Threatened and Federal Candidates

A study conducted in 2013 surveyed 25 sites within and around the study area for evidence of the current or historic presence of state listed and federal candidate mussel species. The survey examined three creeks and their tributaries in and around the study area: Bear Creek, Little Bear Creek, and Slaughter Creek. Of the 25 sites surveyed, eight of them were dry and two of them stagnant. None of the 25 sites surveyed was observed to have shell fragments or living mussels (Cordova et al., 2013). In the winter of 2012, Bear Creek was observed to be dry. It was holding water and flowing again during subsequent field visits conducted in December 2013 and throughout portions of 2014. Based on the results of the Cordova et al. (2013) survey, none of the mussel species identified in **Table 3.8-2** are expected to occur in or immediately downstream of the study area. Therefore, Bear Creek is unsuitable as habitat.

Two of the freshwater mussels identified in **Table 3.8-2**, **smooth pimpleback** (*Quadrula houstonensis*) and **Texas fawnsfoot** (*Truncilla macrodon*), are known to occur in the mainstem of the Colorado River in Colorado County more than 130 miles downstream of the city of Austin (see *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* in **Appendix M: Biological Evaluation and Technical Reports**). These are the only sites known to be occupied by any of the mussel species identified in **Table 3.8-2** downstream of the study area (USFWS, 2011). Based on this distance and the total amount of development contained within the Colorado River watershed, the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**) concluded that the proposed project was incapable of causing a measurable change in water quality in the Colorado River in Colorado County at sites where populations of smooth pimpleback and Texas fawnsfoot occur. Consequently, no direct or indirect impacts to any of the freshwater mussel species identified in **Table 3.8-2** are expected as a result of the proposed project and these species will not be addressed further in this document.

Texas Horned Lizard; State Listed Threatened

The **Texas horned lizard** (*Phrynosoma cornutum*) prefers open, arid to semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees. The soil may vary in texture from sandy to rocky. This species burrows into soil, enters rodent burrows, or hides under rock when inactive. The Texas horned lizard breeds from March to September. Texas horned lizards are extremely dependent on the presence of harvester ants, which comprise up to 69 percent of this species' diet (Pianka and Parker, 1975).

This species was once apparently common throughout most of Texas, but this species is now much more common in the western two-thirds of the state, including the South Texas Brush

Country, than in central or eastern Texas (Linam 2008). The TXNDD does not contain any records of this species from the study area (TXNDD, 2013) and no Texas horned lizards were observed in the state-owned ROW incidental to 2014 field investigations performed by SWCA and Cambrian Environmental (**Appendix M: Biological Evaluation and Technical Reports**). The results of a 10-year volunteer survey for the species sponsored by TPWD and as summarized by Linam (2008) indicated that Texas horned lizard has not been seen on the eastern edge of the Edwards Plateau "in many years." Linam (2008) speculated that reasons for their decline on the Edwards Plateau likely include urbanization and red imported fire ants (*Solenopsis invicta*). Historically, this species almost certainly occurred in what is now the SH 45SW ROW. However, now because the species occurs scarcely in the region, it is considered highly doubtful to be present (**Appendix M: Biological Evaluation and Technical Reports**). See **Section 3.8.3** for additional discussion of this species.

Non-Listed Species of Greatest Conservation Need (SGCN)

In addition to the threatened and endangered species listed in **Table 3.8-2**, according to TPWD there are 39 non-listed state species of greatest conservation need (SGCN) occurring in Travis and Hays counties. The term "species of greatest conservation need" is a term used by TPWD for species whose populations are declining in number or appear to otherwise be in need of conservation to prevent becoming listed as threatened or endangered. Non-listed SGCNs with potential to occur in Travis or Hays County as determined by TPWD are presented in **Table 3.8-3**. These SGCNs are not afforded special regulatory status or protection under the ESA. However, some of the species may be otherwise protected, e.g. migratory bird species which are afforded federal protection under the MBTA.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Amphibians			
Blanco River springs salamander	*Eurycea pterophila*	Subaquatic species found in the springs and caves of the Blanco River drainage basin.	No – study area is outside of the Blanco River drainage basin.
Pedernales River springs salamander	*Eurycea* sp 6	Endemic; known only from springs.	No – the Pedernales River falls outside of the study area.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Arachnids			
Bandit Cave spider	*Cicurina bandida*	Subterranean obligate species.	Yes – Known from Flint Ridge Cave (Travis County & COA, 2011). *Cicurina* spiders presumed to be Bandit Cave spider were found in three caves in the state-owned ROW during the geologic assessment by SWCA/Cambrian Environmental (2014).
Warton's Cave meshweaver	*Cicurina wartoni*	Cave adapted spider; no longer considered a distinct species; synonymized with *C. buwata*, which is known only from caves in Travis and Williamson counties north of the Colorado River; no longer a federal candidate for listing.	No – study area is outside the range of this species
Birds			
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Migrant throughout state; winters along coast and farther south; stopover habitat includes lakeshores, coastlines, and barrier islands.	Yes – Possible migrant through study area. No resources in the study area that are used regularly by the species.
Mountain Plover	*Charadrius montanus*	Nests on ground in shallow depressions within high plains or shortgrass prairie; nonbreeding habitat is shortgrass plains and bare dirt fields.	No – the study area does not have appropriate habitat for this species.
Sprague's Pipit	*Anthus spragueii*	Only in Texas during migration in winter; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitivity to patch size and avoids edges.	No – the study area does not have appropriate grassland habitat for this species; potential for occasional migrant to be forced down into study area by storms.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Western Burrowing Owl	*Athene cunicularia hypugaea*	Open grasslands and savanna; sometimes found in open areas such as vacant lots; nests and roosts in abandoned burrows. Does not nest in Travis or Hays counties.	Yes - possible migrant through study area and possible though unlikely winter visitor; suitable wintering habitat (pastures) in study area limited in extent.
Crustaceans			
An amphipod	*Stygobromus russelli*	Subterranean waters, usually in caves and limestone aquifers; resident of numerous caves across Edwards Plateau.	Possible – species has not been collected in Flint Ridge Cave (Elliott, 1997), but may have been collected at Barton Springs (Geismar and Herrington, 2007), suggesting it could be present in the subgrade of the study area.
A cave obligate crustacean	*Monodella texana*	Subaquatic, subterranean obligate; underground freshwater aquifers of the San Antonio segment of the Edwards Aquifer.	No – the study area is outside the San Antonio segment of the Edwards Aquifer.
Balcones cave amphipod	*Stygobromus balconis*	Subaquatic, subterranean obligate.	Possible – the species has not been collected in Flint Ridge Cave (Elliott, 1997), but has been collected at Barton Springs (Geismar and Herrington, 2007), suggesting it could be present in the subgrade of the study area.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Bifurcated cave amphipod	*Stygobromus bifurcatis*	Found in cave pools.	Possible – the species has not been collected in Flint Ridge Cave (Elliott, 1997), but has been collected at Barton Springs (Geismar and Herrington, 2007), suggesting it could be present in the subgrade of the study area.
Ezell's cave amphipod	*Stygobromus flagellatus*	Known only from the San Antonio segment of the Edwards Aquifer (Holsinger and Longley, 1980).	No – the study area is outside this species' range.
Texas cave shrimp	*Palaemonetes antrorum*	Subterranean sluggish streams and pools of the San Antonio segment of the Edwards Aquifer (Strenth, 1976).	No –the study area is outside this species' range.
Texas troglobitic water slater	*Lirceolus smithii*	Subaquatic, subterranean obligate; found in San Antonio segment of the Edwards Aquifer (Bowman and Longley, 1976).	No –the study area is outside this species' range.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Fish			
Guadalupe bass	*Micropterus treculii*	Endemic to perennial streams of the Edwards Plateau; introduced to Nueces River system.	Possible – Bear Creek has at least intermittent flow on COA WQPL upstream of the state-owned ROW, with this reach observed to support sunfish (*Lepomis* sp.) in the spring of 2013 (P. Sunby/SWCA pers.obs.). A few small largemouth bass (*M. salmoides*) and sunfish were observed in 2014 to be trapped in a drying pool in Bear Creek within the state-owned ROW following a heavy rainfall event (K. White/Cambrian Environmental, pers. obs.)..
Guadalupe darter	*Percina sciera apristis*	Guadalupe River basin; most common over gravel or gravel and sand raceways of large streams and rivers.	No – study area is located outside of the Guadalupe River basin.
Ironcolor shiner	*Notropis chalybaeus*	Primarily Big Cypress Bayou and Sabine River basins; isolated population in San Marcos River (Thomas et al., 2007). ;Not known to occur in the Colorado River watershed.	No – study area is within the Colorado River watershed.
Insects			
A mayfly	*Procloeon distinctum*	No longer considered a distinct species; has been synonymized with *P. texanum*, which is known from Texas, Oklahoma, and Kansas (Jacobus and McCafferty, 2009). Adult stages generally found in shoreline vegetation.	Possible – this mayfly could occur along the margins of Bear Creek upstream of the state-owned ROW.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Edwards Aquifer diving beetle	*Haideoporus texanus*	Habitat poorly known; known from artesian wells in the San Antonio segment of the Edwards Aquifer in Hays County (Bowles and Stanford, 1997).	No –, the study area is outside this species' range.
Flint's net-spinning caddisfly	*Cheumatopsyche flinti*	Very poorly known species; collected from a spring in Hays County; location of spring unknown.	Indeterminate – collection location suggests the species may more likely be associated with the San Antonio segment of the Edwards Aquifer.
Leonora's dancer damselfly	*Argia leonorae*	South central and western Texas; small streams and seepages.	Yes - this species may occur along Bear Creek upstream of the state-owned ROW.
Rawson's metalmark	*Calephelis rawsoni*	Moist areas of shaded limestone outcrops in central Texas; desert scrub or oak woodland in foothills or along rivers and elsewhere.	Yes – limestone outcrops in woodlands are present within the study area, particularly along the margins of Bear Creek.
San Marcos saddle-case caddisfly	*Protoptila arca*	Restricted to the San Marcos River (Edwards and Arnold, 1961).	No – the San Marcos River is outside the study area.
Texas austrotinodes caddisfly	*Austrotinodes texensis*	Restricted to permanent streams fed by spring flow from San Antonio segment of the Edwards Aquifer (Bowles, 1995).	No – the San Antonio segment of the Edwards Aquifer is outside the study area.
Tooth Cave blind rove beetle	*Cylindropsis* sp 1	Known from one cave in Travis County north of the Colorado River	No – known location for this species is outside the study area.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Mammals			
Cave myotis bat	*Myotis velifer*	Cave dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and in abandoned cliff swallow (*Hirundo pyrrhonota*) nests; hibernates in limestone caves of Edwards Plateau and gypsum caves of Texas panhandle during winter.	Yes - limestone caves are known to occur within the study area; the species has been recorded in Flint Ridge Cave (Elliott, 1997).
Plains spotted skunk	*Spilogale putorius interrupta*	Open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairies.	Yes – open fields, forest edges, woodlands, and croplands are present within the study area.
Mollusks			
Creeper (squawfoot)	*Strophitus undulatus*	Small to large streams; gravel or gravel and mud flowing water.	No – not known to occur in Bear Creek or in the Colorado River system downstream of the study area (Howells et al. 1996); surveys conducted by Cordova et al. (2013) were negative.
Plants			
Basin bellflower	*Campanula reverchonii*	Texas endemic; among scattered vegetation on loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks; restricted to igneous-derived soils of Llano Uplift region.	No – the study area is out of the known range of this species.
Boerne bean	*Phaseolus texensis*	Narrowly endemic to rocky canyons in eastern and southern Edwards Plateau; occurring on limestone soils in mixed woodlands, on limestone cliffs and outcrops.	Yes – There is appropriate habitat may be present within the study area along the margins of Bear Creek.

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Correll's false dragonhead	*Physostegia correllii*	Wet, silty clay loams on streamsides, in creek beds, irrigation channels, roadside drainage ditches.	Yes – limited amounts of appropriate habitat for these species may be present along Bear Creek upstream of the state-owned ROW.
Hill Country wild mercury	*Argythamnia aphoroides*	Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clay loams over limestone on rolling uplands; also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes.	Doubtful – some vegetation in study area matches general description of habitat for this species; however, species has been extirpated from Hays County and is not known to occur in Travis County (Poole et al., 2007).
Texabama croton	*Croton alabamensis var texensis*	Endemic; duff covered, loamy clay soils on rocky slopes in forested, mesic limestone canyons; locally abundant on deeper soils on small terraces in canyon bottoms. Known in region only from Pace Bend Park and Balcones National Wildlife Refuge in northwest Travis County, not known from Hays County.	No – the study area is outside the known range of this species (**Appendix M: Biological Evaluation and Technical Reports**).
Warnock's coral-root	*Hexalectris warnockii*	Leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creek beds in canyons on Edwards Plateau the species typically occurs in Texas oak-Ashe juniper woodland (Poole et al., 2007).	Yes –appropriate oak-juniper woodland habitat is present within the study area.
Reptiles			
Spot-tailed earless lizard	*Holbrookia lacerata*	Central and southern Texas; moderately open to prairie-brushland; fairly flat areas free of vegetation and other obstructions, including disturbed areas.	Yes - brushland habitat is present within the study area, although much of it has a well-developed cover of grasses..

Table 3.8-3: TPWD Species of Greatest Conservation Need for Hays and Travis Counties cont'd

Common Name	Species Name	Habitat	Potential for Habitat to Occur in Study Area
Texas garter snake	*Thamnophis sirtalis annectens*	Wet or moist microhabitats are conducive to species occurrence but it is not restricted to these; hibernates underground or in or under surface cover.	Yes –appropriate habitat is present within the study area, particularly along Bear Creek.

Source: TPWD, 2014.

Based on a desktop review of available information, including TXNDD data and limited field investigations, only two of the species identified in **Table 3.8-3**, the Bandit Cave spider and cave myotis bat, have been recorded in the study area (TXNDD, 2013; Elliott, 1997). The Bandit Cave spider is known to occur within Flint Ridge Cave (see **"Flint Ridge Cave"** section below) and *Cicurina* spiders likely to represent this species were collected from three karst features (Cow Pattie Cave, F-65, and SH 45 Cave) during 2014 karst investigations within the state-owned ROW (**Appendix M: Biological Evaluation and Technical Reports**). It is considered probable that Bandit Cave spider occurs elsewhere in the study area in currently unexplored but suitable karst habitat. Cave myotis has also been recorded from Flint Ridge Cave. This species may roost in multiple locations within the study area and members of the species likely forage over the study area during appropriate times of the year (**Appendix M: Biological Evaluation and Technical Reports)**.

As indicated in **Table 3.8-3**, several other SGCNs have varying degrees of potential to occur in the study area. The study area occurs within the Recharge and Transition Zones of the Barton Springs segment of the Edwards Aquifer. The Recharge Zone is characterized by limestone caves and other void space that allows surface water to infiltrate the aquifer. Suitable habitat for aquatic crustacean species (Balcones Cave amphipod, bifurcated cave amphipod, *Stygobromus russelli*) may be present within the aquifer beneath the study area. Water recharging the aquifer from the study area helps support at least two and maybe all three of these species at Barton Springs.

Western Burrowing Owls do not nest in Travis or Hays counties (Lockwood and Freeman, 2014). This species may infrequently occur in the study area during migration, and it is not impossible that a Burrowing Owl may occasionally occur in open habitats of the study area during the winter, although the species is more likely to occur in winter to the east of the Edwards Plateau where agricultural land occurs much more extensively (**Appendix M: Biological Evaluation and Technical Reports**). No habitat used regularly by Western Burrowing Owls is believed to be present in the study area. Arctic Peregrine Falcons may occasionally fly over the study area during the spring and fall migration periods, and migrating

falcons could opportunistically hunt for prey (primarily birds) while crossing through the area. However, the species is not expected to winter in the study area and the area does not contain any resources used regularly by this species.

Guadalupe bass, a mayfly (*Procloeon texanum*), Leonora's dancer, and Correll's false dragonhead all may occur in the study area in direct association with Bear Creek upstream of the state-owned ROW. None of these species is expected to occur within the ROW where Bear Creek holds water only for comparatively brief periods following precipitation events.

Woodlands developed along Bear Creek within the study area may provide habitat for Rawson's metalmark, Boerne bean, and Texas garter snake, and woodlands and other vegetation communities within the study area may provide habitat for this snake as well as for plains spotted skunk. Richer woodlands within the study area may provide suitable habitat for Warnock's coral-root, while open habitat with some bare ground may provide suitable habitat for spot-tailed earless lizard. The potential for the proposed project to directly impact these SGCN is discussed in **Section 3.8.3**. Species identified in **Table 3.8-3** as not having potential to occur in the study area are dropped from further consideration in this document.

Species Protected by the Migratory Bird Treaty Act

The study area is located within central Texas, which falls within the Central Flyway migratory path. The Central Flyway is composed of the states of Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota, and the Canadian provinces of Alberta, Saskatchewan, and the Northwest Territories (TWPD, 2013c; USFWS, 2014).

As discussed in the **TPWD Ecological Mapping Systems of Texas** section, the study area traverses areas of live oak, Ashe juniper, and grasslands. These communities are known to provide suitable nesting habitat for many species of birds protected by the MBTA. Protected migratory bird species are undoubtedly present within the study area year round. Lists of bird species expected to occur in the state-owned ROW during the breeding and winter seasons are provided in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* provided in **Appendix M: Biological Evaluation and Technical Reports**. Nearly all of the species of birds appearing on these lists are protected by the MBTA. See **Section 3.8.3** for discussion of the potential for the proposed project to impact species of birds protected by the MBTA.

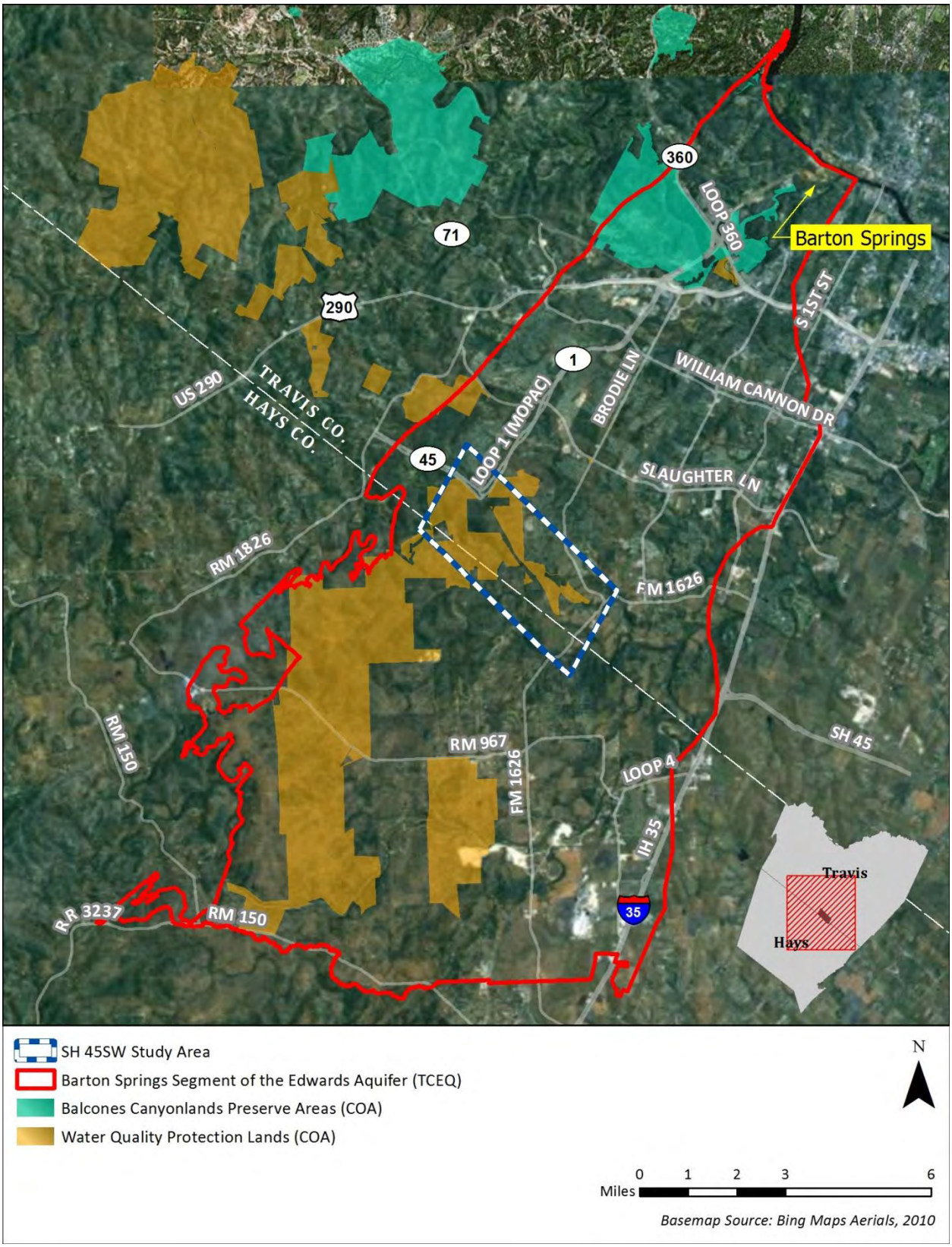
Balcones Canyonlands Preserve

The regional ESA Section 10(a)(1)(B) permit (TE 788841-2), also known as the BCCP, was issued in 1996 to the COA and Travis County by the USFWS. The BCCP is a 30-year regional permit that allows for the incidental take of protected species and their habitat outside

of proposed preserve lands by providing regional mitigation for impacts to covered species associated with development. Under the terms of the permit, COA and Travis County agreed to acquire, set aside, and manage a minimum of 30,428 acres of habitat for the Golden-cheeked Warbler and Black-capped Vireo, and to protect 35 endangered species caves and 27 additional features that support non-listed species the BCCP terms species of concern (SOC), for a total of 62 features (60 caves, one mine, and one karst spring). Many of the features occur north of the Colorado River and several of them occur in clusters, identified in the Regional Permit as the Jollyville, McNeil, and Northwood cave clusters. The environmental integrity of all 62 karst features was proposed to be protected through acquisition and management, or implementation of management/conservation agreements with entities that influence the hydrogeological area needed to protect the features (RECON and USFWS, 1996).

Golden-cheeked Warblers, Black-capped Vireos, some of the caves, and some of the SOC were proposed to be protected together in blocks of conserved land termed macrosite preserve areas. As shown on **Figure 3.8-4**, none of the macrosite preserve areas extends into the study area (COA & Travis County, 1996). Two of the 62 karst features identified for protection in the BCCP are located in the study area: Flint Ridge Cave and Lost Oasis Cave. Lost Oasis Cave is located on the east side of the study area on the margin of a residential neighborhood, opposite of Bailey Middle School. TxDOT is currently investigating the option to participate in the BCCP as a voluntary conservation measure.

Figure 3.8-4: Balcones Canyonlands Preserve and Water Quality Protection Lands



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Flint Ridge Cave

Flint Ridge Cave is located within the study area in direct proximity to the state-owned ROW and is designated for protection under the BCCP (RECON and USFWS, 1996). No state or federally listed threatened or endangered species are known to occupy the cave, but it does support two SOCs covered under the BCCP: the Bandit Cave spider and a ground beetle lacking a common name, *Rhadine austinica*.[11] In addition to the aforementioned species, Flint Ridge Cave is also known to contain these troglobitic species: *Cambala speobia speobia, Speodesmus* sp., *Texoreddellia* sp., and a harvestman, *Texella mulaiki*.

Under the USFWS "No Surprises" Rule, as long as the COA and Travis County operate the BCCP as agreed upon with the USFWS (including the protection of caves containing non-listed covered species), the purchase of Participation Certificates would authorize the take of non-listed covered species such as Bandit Cave spider if in the future they are listed as threatened or endangered. Page 2-31 of the environmental impact statement/habitat conservation plan developed for the BCCP (RECON and USFWS 1996) states that in order for the COA and Travis County to get "No Surprises" assurances under the ESA for caves containing non-listed covered karst invertebrates, the specifically named caves must be protected as follows:

> "To be considered 'protected,' a karst fauna area must contain a large enough expanse of continuous karst and surface area to maintain the integrity of the karst ecosystem on which each species depends. The size and configuration of each karst fauna area must be adequate to maintain moist, humid conditions, air flow, and stable temperatures in the air-filled voids; maintain an adequate nutrient supply; prevent contamination of the surface and groundwater entering the ecosystem; prevent or control the invasion of exotic species, such as fire ants; and allow for movement of the karst fauna and nutrients through the interstitium between karst features. In most instances, this will entail protecting the entire surface and sub-surface drainage area of each cave and enough of the surface vegetation community to support small animals and buffer against fire ant infestations that can eliminate native ant populations. In absence of detailed hydrological studies for use in delineating cave preserve boundaries, land delineated by the contour interval representing the bottom of the cave should be targeted for preservation."

[11] At the time the BCCP was developed, Flint Ridge Cave was believed to support the meshweaver spider *Cicurina cueva*, and the BCCP sought coverage for both *Cicurina cueva* and *Cicurina bandida* (Bandit Cave spider). The two species, along with *Cicurina reyesi*, have since been synonymized as *C. bandida* (USFWS, 2005).

The surface drainage basin for Flint Ridge Cave has been delineated by topographic survey and covers approximately 55.5 acres (see **Appendix H: Biological Evaluation and Technical Reports**). Subsurface drainage basins are areas where water percolates through the soil and overlying bedrock and finds its way to a cave or associated hydrologic flowpaths through faults, cracks, or other small openings. Subsurface drainage basins are typically difficult to delineate because their limits are underground. The COA (2012) indicated the subsurface drainage basin for Flint Ridge Cave is "well defined and documented" and covers "more than 100 acres," but does not provide information regarding how the limits of the basin were delineated. The expected direct effects of the proposed project on the fauna of Flint Ridge Cave are discussed in **Section 3.8.3**.

3.8.3 Direct Effects

Build Alternative

Vegetation

Under the Build Alternative, impacts to vegetation in the state-owned ROW would result from the construction of the proposed project. **Table 3.8-4** identifies the amount of each EMST vegetation type and associated MOU habitat type expected to be impacted as a result of the proposed project. Please note these acreage amounts differ slightly from those in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**). The Biological Evaluation covers a smaller study area than the state-owned ROW examined in the FEIS since the Biological Evaluation did not evaluate developed portions of the state-owned ROW, such as at MoPac.

According to proposed project schematics, approximately 161 acres of vegetation would be impacted by the proposed project. Of these 161 acres, approximately 1.2 acres are floodplain vegetation and approximately 0.7 acre is riparian hardwood. No rare or protected vegetation types are located within the state-owned ROW. Since the project is within the range of suitable habitat of any state or federally listed threatened or endangered species (per the prior MOU), coordination with TPWD was initiated.

Table 3.8-4: EMST Vegetation Types Found Within State-Owned ROW

Vegetation Type	MOU Habitat Type	Acreage within ROW	Acreage Impacted	
			Permanent	Temporary
Edwards Plateau: Ashe Juniper / Live Oak Shrubland	Edwards Plateau Savanna, Woodland, and Shrubland	0.4	0.3	0.0
Edwards Plateau: Ashe Juniper Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	0.3	0.2	0.1
Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	142.5	64.8	9.3
Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest	Floodplain	3.6	1.0	0.2
Edwards Plateau: Live Oak Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	20.0	8.0	1.2
Edwards Plateau: Oak / Ashe Juniper Slope Forest	Edwards Plateau Savanna, Woodland, and Shrubland	0.0	0.0	0.0
Edwards Plateau: Oak / Hardwood Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	0.4	0.3	0.1
Edwards Plateau: Post Oak Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	17.5	10.9	0.8
Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest	Riparian	4.5	0.5	0.2
Edwards Plateau: Riparian Hardwood Forest	Riparian	0.0	0.0	0.0
Edwards Plateau: Savanna Grassland	Edwards Plateau Savanna, Woodland, and Shrubland	36.3	26.1	3.0
Edwards Plateau: Shin Oak Shrubland	Edwards Plateau Savanna, Woodland, and Shrubland	0.5	0.3	0.1
Native Invasive: Deciduous Woodland	Disturbed Prairie	2.6	0.1	0.0
Native Invasive: Juniper Shrubland	Disturbed Prairie	2.1	1.1	0.0
Native Invasive: Mesquite Shrubland	Disturbed Prairie	8.7	2.6	0.4
Urban Low Intensity	Urban	72.4	22.9	6.7
TOTAL ACREAGE		311.7*	139.0	22.0

Acreages are rounded to the nearest tenth, Acreages of impacted vegetation have been updated since the publication of the DEIS as alignment changes have resulted in a different amount of impacts to vegetation. See **Section 3.7.3 for a discussion of alignment changes.*
Note: Acreages of impacted vegetation differ between the FEIS and the Biological Evaluation contained in Appendix M because the Biological Evaluation's analysis does not include portions of the project area that have already been developed (i.e. the portions of the project area on existing roadways) because these areas are already impacted.
Source: TPWD, 2013f

TxDOT's Oak Wilt Prevention Policy would be followed during construction since the proposed project would require removal or trimming of oak trees. This policy requires immediate

dressing of cuts and wounds to oaks; disinfection of pruning tools, saws, and related equipment; and other measures to prevent the spread of oak wilt disease.

Wildlife and Fish

Initial impacts to wildlife from the proposed project would primarily occur as a result of habitat loss during construction. Vegetation within the state-owned ROW would be cleared or otherwise altered to facilitate the construction and operation of the proposed project.

Wildlife within the state-owned ROW would be displaced to other areas during and after construction as a result of habitat loss and disturbance and construction activities.

Construction activities are likely to result in mortality of individuals of some wildlife species that are slow-moving, fossorial, or prone to seek cover in debris or other shelter rather than flee a disturbance activity, or that may be hibernating or are otherwise dormant at the time that construction occurs. Species with these behavioral adaptations include amphibians, burrowing mammals, lizards, and snakes. After construction is complete, automobile traffic may result in further wildlife mortality.

Areas immediately adjacent to the state-owned ROW would be subjected to construction noise and activities that could cause individuals of some wildlife species to seek refuge farther away from the ROW. Noise levels would remain elevated after construction is complete as a result of automobile traffic. Some species of birds may be negatively impacted by increases in ambient noise, which has been shown to impact breeding activity and population size in some species (Forman et al., 2002; Clark and Karr, 1979). Avian species that remain in proximity to the ROW would likely be those that benefit from, or are tolerant of, edge habitat and anthropogenic disturbance. These species typically are generalists and are not species that are in decline or considered to be in need of protection (Forman et al., 2002; Clark and Karr, 1979).

Fish species would not be significantly impacted by the proposed project. Bear Creek, the only water body indicated on published maps as being perennial in the proposed project area (though it has been observed to be ephemeral within the limits of the state-owned ROW), would be bridged to avoid or minimize impacts to the creek and wildlife species in the creek. There may be some impacts from erosion due to construction activities, but BMPs would be put in place to minimize impacts to water quality and wildlife from erosion, as discussed in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***.

After construction is complete, automobile traffic can be expected to result in further wildlife collision mortality (FHWA, 2008). Collision mortality in general is not a limiting factor to most wildlife populations (Forman and Alexander 1998).

Project construction could also result in increased densities of non-native, invasive ant species in the ROW, notably red imported fire ants or tawny crazy ants (*Nylanderia fulva*). Red imported fire ants can be common in disturbed soils along roadsides (Stiles and Jones 1998),

and either species appears to have potential to be inadvertently introduced to the ROW as a result of importation of the fill material needed to raise the roadway as described in **Section 3.3.2**. Both species create potential for displacement of native ant species, and either species could cause localized increase in predation rates on some reptiles, birds, and small mammals (Allen et al. 1994, Texas A&M, 2010b). Much of the fill material used for construction is expected to be cobble, which is less likely to harbor ants than soil would be. TxDOT has committed to conduct surveys for ants in sites proposed as source areas for fill prior to material extraction (see **Section 6.6.1**). Ultimately, however, the ability of TxDOT to absolutely preclude potential for ants to be present in fill material used in the SH 45SW ROW is limited.

In general, impacts to wildlife species would be long-term. Diversity within the state-owned ROW and adjacent areas would likely decrease due to habitat disturbance and fragmentation as well as disturbance from construction and traffic noise. Disturbances to unlisted or otherwise unprotected wildlife species would not necessitate mitigation. Project design, including bridges and open-bottomed culverts, would allow for wildlife to cross the state-owned ROW after the proposed project has been constructed. TxDOT is currently investigating options for installing a game fence in certain areas along the constructed roadway to reduce collision mortality of some wildlife species such as white-tailed deer, axis deer (*Cervus axis*), and feral pigs (*Sus scrofa*). For more information on potential direct impacts to wildlife, please refer to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**).

Migratory Bird Treaty Act

MBTA compliance was incorporated into the karst investigations performed by SWCA and Cambrian Environmental in 2014. Excavation of some karst features required the use of a backhoe. All vegetation that surrounded karst features that had to be cleared for equipment access purposes was first surveyed to ensure that no active bird nests would be disturbed by vegetation clearing activities. Karst features with open entrances were also monitored for evidence of use by nesting birds (e.g., vultures) prior to excavation to ensure that such activities would not disturb any active nests.

Barn Swallows (*Hirundo rustica)* and Cliff Swallows (*Petrochelidon pyrrhonota*) are known to nest in culverts and beneath bridges in the study area, including in association with existing SH 45 and MoPac. Modification of, or disturbance to, any existing bridges and culverts as part of project construction would occur outside of the swallow nesting season to avoid possible impacts to these species. A variety of other birds protected by the MBTA are expected to nest at appropriate season in the state-owned ROW. The MBTA does not prohibit disturbance of habitat used by protected bird species. All vegetation in the ROW that cannot be preserved in place would be removed between September 1 and March 1 in order for vegetation removal activities to occur outside the primary bird nesting season. In addition, the contractor would be prepared to prevent migratory birds from building nests on structures between

February 1 and August 31. All methods to be used to preclude nesting would be approved by the TxDOT Austin District Biologist well in advance of planned use.

In the event that active nests of birds protected by the MBTA are encountered on-site during project construction, every effort would be made to avoid protected birds, active nests, eggs, and/or young. Consequently, the proposed project is not expected to result in the performance of any actions that would violate the MBTA. For more information on potential direct impacts to migratory birds, please refer to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**).

Threatened and Endangered Species

Table 3.8-2 provides a complete list and habitat description of state and federally listed threatened and endangered species known to occur within Travis and Hays counties as well as a discussion on whether or not habitat for those species is known to occur or likely to occur within the study area. The study area lies outside the known geographic range of many of those species, and lies outside of the watershed that supports many of the listed aquatic species that occur in Hays County. As a result, those species were dropped from further consideration in this document. Species of birds expected to occur in the study area only as transients were also dropped from further consideration.

Table 3.8-5 below lists those threatened and endangered species known to occur in Travis and Hays counties that have potential to occur in the study area or that occupy habitat with potential to be impacted by activities occurring in the study area, whether or not appropriate habitat for the species exists within the state-owned ROW, and a determination of potential impacts for each species. Background information used to determine the expected impacts of the proposed project is provided in **Section 3.8.1** and in *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports)**.

Table 3.8-5: **Potential for Impacts to Threatened and Endangered Species**

Common Name	Scientific Name	Federal	State	Habitat Present (Y/N)	Determination of Impact
Amphibians					
Austin blind salamander	*Eurycea waterlooensis*	E	--	N	No Impact - This species is not known to occur within the study area (TXNDD, 2013; TPWD, 2014; USFWS, 2013a). Through the use of BMPs, subsurface water quality will not be significantly impacted by construction or operation of SH 45SW. Therefore, there is anticipated to be no impact to this species from the proposed project.
Barton Springs salamander	*Eurycea sosorum*	E	E	N	No Impact - Based on best available information (USFWS, 2013c; TXNDD, 2013), this species is not known to occur within the study area. Through the use of BMPs, subsurface water quality will not be significantly impacted by construction or operation of SH 45SW. Therefore, there is anticipated to be no impact to this species from the proposed project.

Table 3.8-5: Potential for Impacts to Threatened and Endangered Species cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Y/N)	Determination of Take/Impact
Arachnids					
Bee Creek Cave harvestman	*Texella reddelli*	E	--	N	No Impact - Based on best available information (aci, 2007; Veni, 2007; USFWS, 2009a; **Appendix M: Biological Evaluation and Technical Reports**), this species does not occur within the study area.
Bone Cave harvestman	*Texella reyesi*	E	--	N	No Impact - Based on best available information (aci, 2007; Veni, 2007; **Appendix M: Biological Evaluation and Technical Reports**), this species does not occur within the study area.
Birds					
Black-capped Vireo	*Vireo atricapilla*	E	E	N	No Impact – no suitable habitat in the state-owned ROW; not known nor expected to occur adjacent to the ROW (TxDOT et al., 2014).
Golden-cheeked Warbler	*Setophaga chrysoparia*	E	E	N	No Impact - based on the results of the 2014 presence/absence survey, lack of habitat known to be used by the species within the state-owned ROW, and usual absence of the species from woodland adjacent to the ROW (**Appendix M: Biological Evaluation and Technical Reports**).

Table 3.8-5: Potential for Impacts to Threatened and Endangered Species cont'd

Common Name	Scientific Name	Federal Status	State Status	Habitat Present (Y/N)	Determination of Take/Impact
Reptiles					
Texas horned lizard	*Phrynosoma cornutum*	--	T	N	Uncertain – species not likely to occur in the study area based on general scarcity of the species in the region, and state-owned ROW lacks suitable habitat as a result of presence of a well-developed grass cover.

Source: USFWS, 2013c; TPWD, 2014.

Further discussion of potential impacts to select species is provided below.

Austin Blind and Barton Springs Salamanders

No suitable aquatic habitat for the Austin Blind salamander or the Barton Springs salamander occurs on the surface within or adjacent to the state-owned ROW or any adjacent areas. Exploration of Flint Ridge Cave and water well data (Elliott, 1997; TWDB, 2014) suggest that any potential aquatic habitat beneath the state-owned ROW occurs at significant depth due to the position of the water table (more than 150 feet deep). Whether either species of salamander occurs beneath the ROW is unknown; neither species has been found in aquatic habitat at the bottom of Flint Ridge Cave. Even if salamanders do occur in groundwater beneath the state-owned ROW, so much bedrock lies between the surface and the water table in this area that it appears very unlikely that construction of the road as designed could lead to the breaching of any subsurface void space that has potential to be occupied by salamanders (breaching of void space could potentially cause rocks to fall from a void ceiling and crush salamanders in the water below). Therefore, no direct impacts to either species are expected from roadway construction activities within the ROW.

The proposed project would incorporate state-of-the-art water quality BMPs intended to avoid and minimize impacts to water quality and the Edwards Aquifer, as discussed in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report*.** The TCEQ and USFWS through concurrence letters in 2007 adopted a set of voluntary Optional Enhanced Measures (OEMs) for avoiding water quality-related impacts to five federally listed aquatic species associated with the Edwards Aquifer, including the Barton Springs salamander. Given

the ecological similarities between the Austin blind salamander and the Barton Springs and San Marcos salamanders, it is assumed herein that the USFWS would consider the OEMs effective in preventing development from causing impacts to Austin blind salamander as well.

The OEMs identify a broad menu of options to enhance water quality. Based on the concurrence, if the OEMs are implemented, the USFWS agrees that the project will not result in take of covered species as a result of water quality impacts. According to the USFWS/TCEQ concurrence letters, the proponents of projects that incorporate the OEMs into their plans do not need to consult with the USFWS regarding ESA compliance related to the covered species unless their proposed project is located within one mile of springs occupied by the species. For comparative purposes, the SH 45SW ROW is located more than one mile away from Barton Springs, and more than 1 mile away from other sites recently identified as possibly supporting Barton Springs salamander (Cold Springs, Spillar Ranch Spring, Taylor Springs, and Blowing Sink Cave).

The OEMs were designed primarily for non-linear projects such as residential and commercial developments. It can be more difficult to apply the OEMs to linear projects such as highways where easement or ROW widths may be limited and not allow for inclusion of the types of stormwater controls required to meet the treatment standards achieved under the OEMs. The stormwater controls incorporated into the project BMPs do not meet the OEMs per se. However, the stormwater controls incorporated into the project BMPs as described in **Sections 3.3.2** and **3.6.2** were purposely designed to provide a higher level of water quality protection than that which would be expected to be achieved under minimum compliance with the OEMs, including generally more than 90% removal of TSS. Thus, construction and use of SH 45SW is not expected to result in significant degradation of water quality at Barton Springs or any other sites occupied by this species. Construction of the project is also expected to have an unquantifiable, but possibly slightly positive, effect on the amount of water recharging the aquifer (**Appendix M: Biological Evaluation and Technical Reports**). For all these reasons, the proposed project is not expected to adversely impact these salamander species. Potential indirect impacts are discussed in greater detail in **Appendix D: *Indirect Impacts Technical Report***. Potential impacts to groundwater quality and quantity are discussed further in **Section 3.6.2**. For more information on this impact determination, please refer to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**).

Karst Species

Based on the best available information (aci, 2007; Veni, 2007; USFWS, 2009a; USFWS, 2009b; USFWS, 2009c; USFWS, 2009d; **Appendix M: Biological Evaluation and Technical Reports**), none of the listed karst invertebrates is known nor expected to occur within or adjacent to the existing state-owned ROW or anywhere within the study area. A previous report of the Bone Cave harvestman (*Texella reyesi*) from Barker Ranch Cave No. 1

has been demonstrated to be an error (Ubick, 2014). Therefore, no impact to any listed karst invertebrate species is anticipated. For more information on this determination, please refer to *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas;* and *Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**).

Black-capped Vireo and Golden-cheeked Warbler

No suitable habitat for the Black-capped Vireo is present in or adjacent to the state-owned ROW. No Black-capped Vireos were detected in or adjacent to the ROW during surveys conducted in 2014 (**Appendix M: Biological Evaluation and Technical Reports**), and no individuals of this species have ever been detected on the COA WQPL that border the ROW (SWCA, 2013). As a result, no impacts to Black-capped Vireos are anticipated as a result of the proposed project.

Woodland sharing some of the basic characteristics of Golden-cheeked Warbler habitat is present within the state-owned ROW and Golden-cheeked Warblers are known to occur irregularly on COA WQPLs that border the ROW (SWCA, 2013). However, surveys conducted on behalf of the COA indicate that absence of Golden-cheeked Warblers from woodlands in immediate proximity to the state-owned ROW is the usual condition (SWCA 2013; **Appendix M: Biological Evaluation and Technical Reports**).

A Golden-cheeked Warbler survey was conducted in the state-owned ROW in the spring of 2014 in accordance with USFWS presence/absence survey protocols, which included the playing of recorded Golden-cheeked Warbler songs following the final site visit in an attempt to elicit response from any birds that may have gone undetected during the course of the survey. No warblers were detected within or adjacent to the ROW in 2014 (*State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* in **Appendix M: Biological Evaluation and Technical Reports**). A survey of adjacent woodlands on COA WQPL also failed to detect any Golden-cheeked Warblers in the area in the spring of 2014 (K. Thuesen/COA, pers. comm. to SWCA on 5 June 2014). No Golden-cheeked Warblers have been detected in the state-owned ROW incidental to surveys conducted on adjacent COA lands (SWCA, 2013, 2014). As a result, while some woodland in the ROW shares some characteristics with Golden-cheeked Warbler habitat, none of the woodland is known to be used regularly by the species.

It is expected that TxDOT would clear the state-owned ROW and initiate construction activities outside of the Golden-cheeked Warbler nesting season. Based on past surveys on the COA WQPL, it is considered possible that Golden-cheeked Warblers could in some year again occur in woodland adjacent to the ROW. Studies suggest that road construction noise and road noise have no effect on Golden-cheeked Warbler pairing success, territory placement, or productivity (Lackey et al. 2011, Pruett et al. 2014). Consequently, should a Golden-cheeked Warbler choose to establish a territory in proximity to the state-owned ROW while road

construction was underway, or after the road was built and opened for use, the ability of that warbler to attract a mate or successfully raise young is not expected to be impaired as a result of noise and activity associated with construction or use of the road (**Appendix M: Biological Evaluation and Technical Reports**).

For these reasons, no impacts to the Golden-cheeked Warbler are expected from the proposed project. For more information on this determination, please refer to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* and *State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* (**Appendix M: Biological Evaluation and Technical Reports**).

While impacts to the Golden-cheeked Warbler are not expected, TxDOT is currently investigating participating in the BCCP as a voluntary conservation measure.

Texas horned lizard

Based on surveys of the proposed project corridor in December 2013, no appropriate habitat for the Texas horned lizard is present within the state-owned ROW. Ground cover vegetation within the ROW is thick, leaving little to no areas of sparse vegetation that the Texas horned lizard requires. No Texas horned lizards have been observed in the state-owned ROW incidental to the bird- and karst-related investigations performed therein (**Appendix M: Biological Evaluation and Technical Reports**). It is highly likely that this species occurred in this general area historically, but the population of the species on the Edwards Plateau in central Texas has been greatly reduced (Linam, 2008). Consequently, while no specific surveys for this species have been conducted as part of the proposed project it is highly doubtful the species is present in the state-owned ROW. Therefore, no impact to Texas horned lizards is expected as a result of the proposed project.

Species of Greatest Conservation Need

Table 3.8-3 provides a complete list and habitat description of state SGCNs, as determined by TPWD, known or expected to occur within Travis and Hays counties as well as a discussion on whether or not habitat for those species was known to occur or likely to occur within the study area. Many of the species identified in **Table 3.8-3** do not have potential to occur in the study area and were dropped from further consideration in this document.

Table 3.8-6 below lists the SGCNs with potential to occur in the study area, identifies whether or not appropriate habitat for the species exists within the state-owned ROW, and provides a determination of potential impacts for each species. Background information used to determine the potential impact of the proposed project is provided in **Section 3.8.1**. Only those species with the potential to have habitat in the state-owned ROW are carried forward for analysis. See the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* in **Appendix M: Biological Evaluation and Technical Reports** for rationale

leading to no impact findings for those species identified in **Table 3.8-6** that are not carried forward for analysis.

Table 3.8-6: Potential to Impact Species of Greatest Conservation Need

Common Name	Scientific Name	Habitat Present in ROW (Y/N/?)	Determination of Impact
Arachnids			
Bandit Cave spider	*Cicurina bandida*	Y	May Impact
Birds			
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Y	No Impact
Western Burrowing Owl	*Athene cunicularia hypugaea*	Y	No Impact
Crustaceans			
An amphipod	*Stygobromus russelli*	?	No Impact
Balcones cave amphipod	*Stygobromus balconis*	?	No Impact
Bifurcated cave amphipod	*Stygobromus bifurcatis*	?	No Impact
Fishes			
Guadalupe bass	*Micropterus treculii*	N	No Impact
Insects			
A mayfly	*Procloeon distinctum*	N	No Impact
Leonora's dancer damselfly	*Argia leonorae*	N	No Impact
Rawson's metalmark	*Calephelis rawsoni*	Y	May Impact
Mammals			
Cave myotis bat	*Myotis velifer*	Y	May Impact
Plains spotted skunk	*Spilogale putorius interrupta*	Y	May Impact
Plants			
Boerne bean	*Phaseolus texensis*	Y	May Impact
Correll's false dragonhead	*Physostegia correllii*	N	No Impact
Hill Country wild mercury	*Argythamnia aphoroides*	?	No Impact
Warnock's coral-root	*Hexalectris warnockii*	Y	May Impact
Reptiles			
Spot-tailed earless lizard	*Holbrookia lacerata*	N	No Impact
Texas garter snake	*Thamnophis sirtalis annectens*	Y	May Impact

Source: TPWD, 2014.

Bandit Cave spider is known to occur in Flint Ridge Cave and *Cicurina* spiders that are presumed to represent this species were found in three karst features within the state-owned ROW during karst investigations performed by SWCA and Cambrian Environmental (see *Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas* in **Appendix M: Biological Evaluation and Technical Reports**). All three of these features (Cow Pattie Cave, F-65, and SH 45 Cave) would be avoided by the proposed project, so construction would not directly disturb any of the karst features where this species is known or assumed to occur and is not expected to impair the ability of those features to continue to support Bandit Cave spiders. However, some potential exists for this species to occur within the ROW in sub-surface void space that lacks surface expression. If so, it would be expected that Bandit Cave spiders would

be feeding on prey that was subsisting on nutrients introduced to the void space by plant roots or that were carried underground by surface water. Within most of the ROW, the potential for spiders to occur in undiscovered void space appears to be reasonably low because the thick covering of terra rossa soils (**see Section 3.3.1**) present across much of the ROW can be expected to prevent subsurface void space from receiving the surface nutrients necessary to support karst fauna. Bandit Cave spiders would have a greater chance to occur in undiscovered void space in areas with thinner soils. If present in such areas, road construction might not directly destroy the void space because most of the roadway would be built on fill material. But, the addition of fill and pavement could block further introduction of nutrients to the subsurface systems, thereby rendering the void space unsuitable for further use by Bandit Cave spiders through elimination of their prey base.

Some of the vegetation communities within the state-owned ROW provide habitat that could be used by Arctic Peregrine Falcons and Western Burrowing Owls, but neither species is expected to occur in the ROW except as an occasional visitor. Consequently, the proposed project would not result in loss of habitat that is used regularly by either species and, so, neither species is expected to be adversely impacted by the project.

All three amphipod species identified in **Table 3.8-6** may occur in aquatic habitats in the sub-grade of the state-owned ROW. However, for the same reasons discussed for Austin blind and Barton Springs salamanders, the proposed project is not expected to adversely impact the quality or quantity of water discharging at Barton Springs. Consequently, no impacts to any of these three amphipod species are expected as a result of the proposed project.

The status of Rawson's metalmark in the state-owned ROW is unknown. If present, it is mostly likely to occur in woodland developed along the Bear Creek corridor, where construction of the proposed project would then result in the loss of some habitat used by this species. The loss of woodland at Bear Creek, if actually used by the species, would likely represent a minor negative impact to the species given the project scale.

Cave myotis bats are known to occur, at least on occasion, in Flint Ridge Cave and so some individuals of this species likely forage over the state-owned ROW on a seasonal basis. Construction of the proposed project, therefore, would likely cause the loss of vegetation that supports a portion of the flying insects that provide the prey base for this species. Given the scale of the proposed project, the loss of this vegetation is not likely to cause significant impacts to this species at the population level or alter its status in the region so this impact is considered to be minor. The bridge that would be constructed over Bear Creek might be used for roosting by cave myotis, thereby providing beneficial shelter.

The status of plains spotted skunk in the state-owned ROW is unknown. If plains spotted skunk does occur in the ROW and on adjacent lands, then construction of the project would result in the loss of habitat used by, or available for use by, the species and use of the roadway could cause the species to suffer occasional vehicle collision mortality. If plains spotted

skunks do not occur regularly in or adjacent to the state-owned ROW, then loss of vegetation to construction of the roadway would have a negligible impact on this species. Use of the roadway could still result in the very occasional spotted skunk collision mortality, however, since it would be possible for non-resident spotted skunks to traverse the area.

The status of Boerne bean, Hill County wild mercury, and Warnock's coral-root in the state-owned ROW are also unknown. TxDOT considered it highly probable that Hill Country wild mercury is absent from the ROW and, therefore, would not be impacted by project construction (*Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* in **Appendix M: Biological Evaluation and Technical Reports**). TxDOT also found it most likely that the other two plant species are absent from the ROW owing to the comparatively xeric nature of woodlands present in the ROW (ibid). However, presence of any of these species in the ROW cannot be ruled out conclusively. If present, vegetation clearing and road construction activities would be expected to remove any individuals of these species from within the construction footprint. Because it appears more likely these species do not occur in the ROW than they do occur, any negative impact to these species resulting from the proposed project would likely involve a small number of individual plants and, so, represent a minor to negligible impact on the species.

Texas garter snakes most often occur in proximity to aquatic habitats. The status of this species in the state-owned ROW is unknown. If present, construction of the proposed project would result in loss of habitat available for use by the species. It could also conceivably cause the death of individual snakes if they were present in, and unable to escape from, areas disturbed by earth-moving equipment. Following construction, Texas garter snakes could also suffer occasional vehicle collision mortality once the road was open for use, although the bridge over Bear Creek could provide this species with a safe travel corridor across the ROW in the area where the species may be most likely to occur. If not present in or adjacent to the ROW, then construction of the proposed project would be expected to have negligible impact on this species.

Mitigation for SGCNs would not be required as there are no official federal or state regulations protecting these species. Therefore, no further action on impacts to these species is required.

Flint Ridge Cave

Flint Ridge Cave is a sensitive recharge feature with its surface opening located approximately 150 feet outside of the state-owned ROW. As such, the mouth of the cave would not be disturbed by construction of SH 45SW. The cave is known to support two BCCP SOC, the Bandit Cave spider and an unnamed ground beetle (*Rhadine austinica*), along with several other troglobitic species. The cave extends to a depth of approximately 152 feet and it has a comparatively large surface drainage basin (55.5 acres). Because of its large surface drainage

basin, Flint Ridge Cave has been known to be completely inundated by stormwater during flood events (David Johns/COA, personal communication, March 28, 2014).

Approximately 0.7 acre of the 55.5-acre surface drainage basin for this cave lies within the state-owned ROW, and a section of cave passage lies approximately 150 feet beneath the ROW. Under the Build Alternative, approximately 1.3 percent (approximately 0.7 acres out of approximately 55.5 acres) of the Flint Ridge Cave surface drainage basin would be covered by impervious surfaces. To mitigate for this impact, the existing size of the Flint Ridge Cave surface drainage basin would be maintained by re-contouring another 0.7 acre of undeveloped land to incorporate that area into the cave's surface drainage basin.

Under the proposed design, no runoff from the roadway would enter the surface drainage basin of Flint Ridge Cave. This would be accomplished through the installation of concrete traffic barriers and accompanying stormwater infrastructure that would convey roadway runoff to a water quality pond situated outside of the surface catchment basin where the water would be treated and then discharged to Bear Creek and possible recharge to the aquifer. Recharge occurring in the bed of Bear Creek is not believed to travel to Flint Ridge Cave (Hauwert, 2012).

Karst systems rely on the input of nutrients from surface systems and they typically occur in a stable physical environment because caves are naturally buffered against severe changes in temperature and relative humidity. Nutrients can be washed into caves as detritus by surface water runoff, provided by plant roots that breach cave ceilings, or introduced to caves by animals that travel between karst and surface systems (such animals are known as trogloxenes).

The potential effect of construction of SH 45SW on the karst fauna of Flint Ridge Cave is examined in the *Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas* and summarized in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports)**.

To summarize the above-mentioned documents further, the entrance to Flint Ridge Cave is situated within a block of COA WQPL that exceeds 350 acres in size. Following construction of SH 45SW, this amount of open land would be expected to be capable of supporting whatever trogloxenes are helping to support the Flint Ridge Cave ecosystem. Maintenance of the size of the cave's surface drainage basin would also ensure Flint Ridge Cave continued to receive pre-construction levels of nutrients as washed into the cave by surface water runoff. Consequently, construction of SH 45SW is not expected to alter the nutrient regime that supports the karst fauna of Flint Ridge Cave.

Owing to the depth of the cave, construction of SH 45 SW is not expected to alter the temperature of the karst environment of Flint Ridge Cave, and the design of the road would

prevent runoff from the road from potentially contaminating the cave. Construction of SH 45SW over the top of a very deep section of cave passage is not expected to materially reduce the amount of water reaching the cave via its subsurface drainage basin. It appears highly probable that because the surface drainage basin for the cave is so large, the karst environment receives ample input of moisture from the surface drainage basin of the cave. TxDOT et al. (2014) speculated that proposing to maintain the size of the surface drainage basin of Flint Ridge Cave, while beneficial to aquifer recharge, could actually work against the cave's karst fauna since the invertebrates are air-breathing creatures and the cave is susceptible to inundation during periods of heavy rainfall.

Ultimately, owing to the dimensions of Flint Ridge Cave and its surface drainage area, and location of the cave entrance within an extensive amount of COA WQPL, no impacts to the karst fauna of Flint Ridge Cave are expected as a result of construction of SH 45SW. For this reason, it is considered herein that the karst ecosystem of Flint Ridge Cave would be maintained following construction of SH 45SW and that, following construction, the cave should be able to be considered as "protected" pursuant to the stipulations of the BCCP as it is today. See the previously referenced documents provided in **Appendix M: Biological Evaluation and Technical Reports** for the complete analysis that leads to this conclusion.

Runoff into Flint Ridge Cave even after intense storm events has been shown to be clear and of good quality (COA, 2012). The analyses of potential impacts to groundwater recharge as a result of the proposed project show that the water quality of runoff entering Flint Ridge Cave would be maintained (**Section 3.6**).

No Build Alternative

Under the No Build Alternative, no impacts to vegetation, wildlife, SOCs, or SGCNs would occur in the state-owned ROW. Similar to the Build Alternative, no direct impacts to threatened and endangered species would be expected under the No Build Alternative. In absence of SH 45SW, a greater number of vehicles in the future are expected to utilize Brodie Lane and other roadways on the Recharge Zone that are not equipped with the robust stormwater control BMPs proposed to be used as part of the proposed project. Thus, under the No Build Alternative, more pollutants generated by vehicles outside of the state-owned ROW could be introduced to groundwater of the Barton Springs segment of the Edwards Aquifer than would be expected under the Build Alternative

3.8.4 Encroachment-Alteration Effects

Encroachment-alteration effects as a result of the proposed project could result in additional loss and fragmentation of vegetation communities on developable lands within the study area. However, no frontage roads would be built as part of the proposed project and much of the state-owned ROW is adjacent to COA WQPLs, limiting the amount of encroachment that

could occur in response to the proposed project. Review of the figures contained in this document that use an aerial photograph as a base (e.g., **Figure 3.5-1**) reveals that the absence of SH 45SW has not precluded development from occurring to the south of the study area. Nonetheless, if development does occur within the study area in response to presence of SH 45SW, it would be expected to occur in the southern portion of the study area since land on the north end of the study area can already be developed with access to MoPac or existing SH 45.

Encroachment-alteration effects from the proposed project may reduce usable habitat for some species of birds that avoid edge habitat as habitat may be fragmented by development. This may promote generalist species while limiting the ability of other, less generalist species to thrive. Most vegetation communities in the southern portion of the study area, which is the portion of the study area where development could occur in response to presence of SH 45SW, are relatively open and woodlands are distributed patchily. Consequently, wildlife occurring in the southern portion of the study area is likely composed predominantly of species that will utilize relatively open habitats and edge habitats. As a result, encroachment effects to wildlife as a result of the habitat losses associated with the proposed project are likely to be minor. Automobile traffic from the proposed project may result in increased wildlife mortality from automobile-wildlife conflict. Traffic noise may drive away species that are sensitive to increased ambient sounds.

No encroachment-alteration effects to endangered species are expected as a result of the proposed project. The Golden-cheeked Warbler is the only listed species known to occur in the study area. The results of surveys performed in the state-owned ROW and on COA WQPL coupled with review of aerial photography suggest the only locations within the study area and outside the WQPL that this species can be expected to occur regularly is in the northwestern portion of the study area. Some development has occurred and is occurring in this general area, all of which has access to existing SH 45. Because of access to existing SH 45, development can occur in this area in the future regardless of whether or not SH 45SW is built. Consequently, if Golden-cheeked Warblers do occur in that portion of the study area, any impacts to the species in that area would be considered to occur independently of SH 45SW.

One pair of Golden-cheeked Warblers was present in 2013 in a patch of woodland on the COA WQPL to the south of Bear Creek and east of the state-owned ROW. This patch of woodland has been surveyed in seven different years over the period of 2000-2014 (including in 2014) and 2013 was the only year in which the species was found to occupy this patch of woodland (**Appendix M: Biological Evaluation and Technical Reports**). SWCA performed an analysis modeled on the findings of Magness et al. (2006) and based on expected change in total woodland cover on the landscape that indicates that clearing of the state-owned ROW for construction of the proposed project might be expected to influence the future rate of usage of this patch of woodland by Golden-cheeked Warblers, except that the documented rate of usage is already below that which would be expected based on the amount of woodland cover on the landscape (*State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* in **Appendix**

M: Biological Evaluation and Technical Reports). SWCA postulated that usual absence of Golden-cheeked Warblers from this patch of woodland is, therefore, likely the result of the presence of this patch of woodland on the very edge of the Edwards Plateau, causing it to be located rather remotely and isolated from the regional Golden-cheeked Warbler population (*State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report* in **Appendix M: Biological Evaluation and Technical Reports**). The potential for Golden-cheeked Warblers to occur in woodland adjacent to the ROW may be somewhat reduced following the clearing of the ROW owing to a reduction in total amount of woodland on the landscape (**Appendix M: Biological Evaluation and Technical Reports**). The analysis did suggest, however, that the amount of woodland cover remaining on the landscape after construction of SH 45SW would be sufficient to enable that patch of woodland to continue to receive use by Golden-cheeked Warblers.

Some studies have shown Golden-cheeked Warblers to be sensitive to edge habitat (Reidy et al., 2009; Peak, 2007). According to TWPD (1990) and Reidy et al. (2008), a higher density of edge habitat can lead to further declines in the Golden-cheeked Warbler population due to an increase in nest predation, brood parasitism, and interspecific competition in edge habitat. Clearing of vegetation for construction of SH 45SW would not introduce edge habitat to the patch of woodland that was occupied by the pair of Golden-cheeked Warblers in 2013 because it is separated from the state-owned ROW by a cleared transmission line easement.

Studies (Benson, 1995; Lackey et al., 2011; Pruett et al., 2014) indicate that construction and road noise do not cause significant effects on Golden-cheeked Warbler pairing, territory placement, or reproductive success. Therefore, if Golden-cheeked Warblers were to again occur in the patch of woodland to the east of the ROW and south of Bear Creek (which is by no means certain even in absence of SH 45SW) following construction of the roadway, the presence and use of the road would not be expected to adversely impact the ability of those birds to nest successfully.

Both the Barton Springs and Austin blind salamanders are entirely dependent on the water of the Edwards Aquifer. Both species of salamanders are neotenic, never develop a terrestrial form, and spend their entire lives in aquatic habitats within or supported by discharge from the Barton Springs segment of the Edwards Aquifer. Most privately held lands within the study area that are located on the Recharge Zone for the Barton Springs segment of the Edwards Aquifer are in the north end of the study area and can be developed with access to existing SH 45 or MoPac. Consequently, while additional residential or commercial development may occur in the future on the Recharge Zone within the study area, it would largely be expected to occur independently of SH 45SW and any effects of that development on the Austin blind and Barton Springs salamanders as a result of changes to the quality or quantity of water discharging at Barton Springs would not be attributable to construction of SH 45SW. If development were to occur in direct response to the presence of SH 45SW, it seems likely to occur on the south end of the study area, which is outside of the Recharge Zone.

The proposed project would add approximately 48.1 acres of impervious cover to the Recharge Zone of the Edwards Aquifer in addition to the approximately 17.7 acres of impervious cover already present within the Recharge Zone within the state-owned ROW. The additional 48.1 acres of impervious cover added by the proposed project represents less than 0.1 percent of the 56,558 total acres of the Recharge Zone of the Barton Springs segment of the Edwards Aquifer. Through the use of BMPs, at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone would be removed. These BMPs would mitigate for impacts from stormwater runoff from the proposed project.

All karst features occurring in the state-owned ROW were excavated and evaluated with regard to their potential to support listed karst invertebrate species (**Appendix M: Biological Evaluation and Technical Reports**).

No encroachment-alteration effects on listed karst species are expected because the study area lies outside the known range of all listed karst invertebrate species. Possible encroachment-alteration effects to SGCNs from the proposed project would be generally similar to those expected as a result of construction of the proposed project. Any development occurring on the Recharge Zone within the study area could create potential to impair aquatic habitat used by amphipods or cause loss of habitat used by Bandit Cave spider or that supports Warnock's coral-root, although any such development can be expected to be performed in compliance with TCEQ Edwards Aquifer Rules and is likely not to be attributable to presence of SH 45SW since most lands on the Edwards Plateau within the study area can be developed with access to MoPac or existing SH 45.

Any development occurring in direct response to SH 45SW would decrease vegetative cover, likely causing non-significant decreases in prey availability to foraging cave myotis bats. Development in the study area is not expected to impact Arctic Peregrine Falcons or Western Burrowing Owls. Development could reduce habitat availability for, and fragment habitats used by, plains spotted skunk, Texas garter snake, and spot-tailed earless lizard, although it is uncertain whether any of these species actually occurs in the study area. If present, development activities could result in mortality of snakes and lizards, especially if conducted in colder weather months when the species are inactive. Increased development would also lead to increased potential for skunks, snakes, and lizards to suffer vehicle collision mortality, if present in the study area.

Lands within the study area most likely to support Guadalupe bass, Leonora's Dancer, the unnamed mayfly, Rawson's metalmark, Correll's false dragonhead, and Boerne bean are all located in direct association with Bear Creek and mostly on COA WQPL or on properties with access to existing SH 45, so these species are not likely to be significantly impacted by any development occurring in response to presence of SH 45SW. It is highly probable that Hill Country wild mercury does not occur within the study area, so this species too is not likely to be

significantly impacted by any development occurring in response to construction of the proposed project.

For more information on the encroachment-alteration effects to wildlife, threatened and endangered species and SGCNs, please refer to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (**Appendix M: Biological Evaluation and Technical Reports**).

3.9 Archeological Resources

Archeological resources are sites and locales containing interpretable material traces of past human activity in the form of artifacts, ruins, structural remnants, or other human-made feature remains either on the surface or buried below ground. Archeological resources include materials and artifacts ranging in age from more than 10,000 years old to 50 years old.

At the state level, the proposed project is subject to the provisions of the Antiquities Code of Texas (ACT) because it involves "lands owned or controlled by Texas or any city, county, or local municipality thereof." The ACT allows for resources to be considered as potential State Antiquities Landmarks (SALs) and requires that each be examined in terms of possible "significance." Significance standards for the code are clearly outlined in Chapter 26 of the Texas Historical Commission's (THC's) *Rules of Practice and Procedure for the ACT.* At the state level, an archeological site's significance is determined by one or more of the following criteria:

1. A site has the potential to contribute to a better understanding of the prehistory and/or history of Texas by the addition of new and important information;

2. A site's archeological deposits and the artifacts within the site are preserved and intact, thereby supporting the research potential or preservation interests of the site;

3. A site possesses unique or rare attributes concerning Texas prehistory and/or history;

4. The study of a site offers the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and

5. There is a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is needed to ensure maximum legal protection, or alternatively, further investigations are needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

If the lead agency and the State Historic Preservation Officer (SHPO) agree that a resource potentially affected by a proposed project is eligible for inclusion in the National Register of Historic Places (NRHP), then they are required to apply the Criteria of Adverse

Effect found in 36 CFR Section 800.5 to such a resource. Under this regulation, an "adverse effect is found when an undertaking may alter directly or indirectly, any of the characteristics of the resource that make it eligible for the NRHP." An adverse effect may be found when such characteristics are altered "in a manner that would diminish the integrity of a resource's location, design, setting, materials, workmanship, feeling, or association." If an adverse effect is determined, then the regulations require the federal agency and the SHPO to seek ways to avoid the resource, minimize the impacts, and mitigate for effects.

3.9.1 Existing Conditions

Archeological Area of Potential Effect (APE)

The archeological Area of Potential Effect (APE) for the proposed project includes the existing state-owned ROW for the proposed SH 45SW and segments of existing MoPac, SH 45, FM 1626, and Bliss Spillar Road to facilitate connections with the proposed SH 45SW facility (shown in **Figure 2.4-1** and **Table 3.9-1**). The overall archeological APE for the proposed project is approximately 33,520 linear feet in length with a typical width of 300 feet, though the width expands to a maximum of 1000 feet wide at interchanges. The total acreage within the APE is 311.65 acres. Based on standard construction techniques, the APE extends approximately two to three feet below ground surface for roadway construction, up to 10 feet below ground surface for culverts, and 20 to 30 feet below ground surface for bridge support columns.

Table 3.9-1: Area of Potential Effect

ROW Section	Length (linear feet)	Area (acres)
SH 45SW	17,415	167.12
MoPac	2,773	49.24
SH 45	4,926	61.95
FM 1626	4,996	24.75
Bliss Spillar Road	3,410	8.59
Total	**33,520**	**311.65**

Note – the 2.56-acre discrepancy from the DEIS (discussed in footnote to Table 2.4-1) was assessed and was determined to have no effect on archeological historic properties or any potential SALs.
Source: TxDOT, 2013.

A review of THC's Archeological Sites Atlas (Atlas) was conducted to identify previous archeological investigations, previously recorded archeological sites, archeological sites listed on the NRHP, SALs, and historic cemeteries located within the study area. The search revealed that 12 previous archeological projects (10 surveys and two excavations) have occurred within or adjacent to (i.e., within 100 meters [328.1 feet] of) the proposed project APE. There are no known cemeteries or historic districts within or adjacent to the proposed project APE.

There are 13 previously recorded archeological sites within or adjacent to the proposed project APE. None of the known sites are SALs or listed on the NRHP. Although none are listed

on the NRHP or designated as SALs, there is one site that has been determined eligible for inclusion in the NRHP and worthy of SAL designation.

Previous Investigations

A review of the Atlas indicated that since 1984, 12 archeological projects (10 surveys and two excavations) have been conducted within, or overlap parts of, the proposed project APE. **Table 3.9-2** summarizes the previous project information. The inventory includes the 2003 survey of the state-owned SH 45SW ROW from MoPac to FM 1626; **Appendix K: Agency Coordination** provides the TxDOT and THC coordination letter concurring that the SH 45SW ROW surveyed in 2003 was cleared for archeological resources except for additional investigations at 41TV1051 (see below).

Table 3.9-2: Previous Archeological Investigations

Project	Sponsor/ Client	Site(s) Discovered or Revisited Within or Adjacent to Proposed Project APE	Approximate Distance to ROW Segments within the Proposed Project APE	Reference(s)
Bear Creek Survey (1984)	Randy Morine Developments	41HY177, 41TV1049, 41TV1050, 41TV1051, 41TV1052, and 41TV1053	Survey Area is traversed, from SE to NW, by SH 45SW ROW	Brown 1985
Archeological Survey between Bliss Spillar Road and Bear Creek (1985)	State Department of Highways and Public Transportation	None	Survey corridor traversed by SH 45SW ROW at Bliss Spillar Road and where ROW crosses south bank of Bear Creek	None as per Texas Archeological Sites Atlas (2014)
South Mopac Boulevard Extension (1987)	State Department of Highways and Public Transportation	None	Parts of the previous survey areas are within the proposed project APE at the MoPac/SH 45 transition	None as per Texas Archeological Sites Atlas (2014)
Outer Parkway Survey (1989)	State Department of Highways and Public Transportation	41HY211, 41TV1424, 41TV1050, and 41TV1051	From FM 1626 north to MoPac, the SH 45SW ROW overlaps and extends beyond the Outer Parkway corridor	None as per Texas Archeological Sites Atlas (2014)
State Highway 45 Survey (1989)	State Department of Highways and Public Transportation	41TV1537, 41TV1538, and 41TV1540	Sites 41TV1537 and 41TV1538 are within the SH 45 ROW, Site 41TV1540 is within the SH 45 and MoPac ROW adjacent to the northern terminus of the existing SH 45 SW ROW	None as per Texas Archeological Sites Atlas (2014)

Table 3.9-2: Previous Archeological Investigations cont'd

Project	Sponsor/ Client	Site(s) Discovered or Revisited Within or Adjacent to Proposed Project APE	Approximate Distance to ROW Segments within the Proposed Project APE	Reference(s)
SH 45 Extension Project: Loop 1 to FM 1626 Survey (2003)	Texas Department of Transportation	41TV1051	This survey examined the SH 45SW ROW that was purchased by Travis and Hays counties	Nash and Staples 2003
SH 45 Extension Project: Loop 1 to FM 1626: Test excavations (2003)	Texas Department of Transportation	41TV1051	Test excavations within the SH 45SW ROW	Staples and Nash 2012
Manchaca to Escarpment Transmission Line-420 Survey (2006)	Lower Colorado River Authority	41TV1051, 41TV1424, 41TV1540, 41TV2236, 41TV2237, 41TV2238	Survey corridor parallels the east side of the SH 45SW ROW from FM 1626 to MoPac/SH 45; expanded site 41TV1424 into the SH 45SW ROW	Hixson et al. 2007a
Transmission Line 363 Survey (2006)	Lower Colorado River Authority	41TV2188	Survey corridor is approximately 40 meters (131.2 feet) north of the existing SH 45 ROW	Hixson et al. 2007b
SH 45 Extension Project: Loop 1 to FM 1626: Historic research, test excavations, and data recovery (2007 through 2009)	Texas Department of Transportation	41TV1051	Archival research, testing, and data recovery excavations within the SH 45SW ROW at the Ransom and Sarah Williams Farmstead component of the site	Boyd 2009; Boyd et al. 2011
Archeological Survey of Lakewood Drive (2008)	Hays County	None	The northern end of Lakewood Drive intersects with FM 1626 within the proposed project APE approximately 400 meters (1,312.3 feet) southwest of the SH 45SW ROW/FM 1626 intersection	Butler 2008
Keith Harris Memorial Cell Tower (2012)	Unknown	41TV2188	Cell tower survey area is immediately adjacent to the north side of the existing SH 45 ROW between Escarpment Boulevard and MoPac	None as per Texas Archeological Sites Atlas (2014)

Known Archeological Sites

From the inventory of the 13 previously recorded archeological sites within and/or adjacent to the proposed project APE, none of the sites are listed on the NRHP or designated

SALs, though one site is eligible for SAL designation and inclusion in the NRHP. Six sites have been determined ineligible for SAL designation or inclusion in the NRHP and six sites are not recommended eligible for any registration. Additionally, one part of site 41TV2188 has been determined ineligible, while the remainder of the site has been recommended ineligible. **Table 3.9-3** summarizes the previously recorded site data.

Table 3.9-3: Known Archeological Sites

Site	Documentation Date(s)	Site Description	SAL/ NRHP Eligibility	Approximate Distance to ROW Segments within the Proposed Project APE
41HY177	1984	Former historic house site with cistern in Hays County	Not recommended eligible by recorders	Adjacent to (i.e., within approximately 100 meters [328.1 feet]) the SH 45SW ROW
41TV1049	1984	Historic farmstead; when recorded (1984), archival research was recommended to determine age	Determined ineligible 2006	Adjacent to (i.e., within approximately 100 meters [328.1 feet]) the east side of SH 45SW ROW
41TV1050	1984 and 1989	Surficial prehistoric stone procurement site common to area; not recommended eligible	Not recommended eligible by recorders	Adjacent to (i.e., within approximately 100 meters [328.1 feet]) the west side of SH 45SW ROW

Table 3.9-3: Known Archeological Sites cont'd

Site	Documentation Date(s)	Site Description	SAL/ NRHP Eligibility	Approximate Distance to ROW Segments within the Proposed Project APE
41TV1051 (Ransom and Sarah Williams Farmstead)	1984, 1989, 2003, 2006, and 2007 through 2009	Historic and prehistoric site; test excavations completed in 2003 followed by data recovery excavations of the Ransom and Sarah Williams Farmstead component in 2008; originally recorded as a mid-twentieth century ranchstead which included pens, outbuildings, a cement house foundation and below-ground cistern. It later was enlarged to include an earlier historic component located some distance to the north. This component consists of a chimney fall, an extensive series of rock walls or fences, and artifact scatters consistent with turn-of-the century and earlier occupations (i.e., Williams Farmstead). In 2003, 41TV1051 was expanded to encompass nearby previously recorded site 41TV1052, an extensive prehistoric lithic scatter that is now considered to be a prehistoric component of 41TV1051. Because of the conflation of 41TV1052 into 41TV1051, 41TV1052 is not included in the site inventory within or adjacent to the SH 45SW APE.	Determined eligible within SH 45SW ROW	The site is within the SH 45SW ROW, as well as extending south-southwest and north-northeast of the SH 45SW ROW
41TV1053	1984	Surficial prehistoric stone procurement site common to area	Not recommended eligible by recorders	Approximately 120 meters (393.7 feet) east of the SH 45SW ROW
41TV1424	1989 and 2006	Surficial prehistoric stone quarry/stone procurement site common to area	Determined ineligible 2006	Site is within the SH 45SW ROW (following the 2003 TxDOT survey, the site boundaries were extended east into the SH 45SW ROW during transmission line survey by LCRA); the site also extends west of the SH 45SW ROW

Table 3.9-3: Known Archeological Sites cont'd

Site	Documentation Date(s)	Site Description	SAL/ NRHP Eligibility	Approximate Distance to ROW Segments within the Proposed Project APE
41TV1537	1989	Largely surficial prehistoric stone quarry/stone procurement and lithic scatter site common to area	Not recommended eligible by recorders	Site was recorded within the SH 45 ROW and extending north and south of the ROW; subsequent roadway construction has removed site from the ROW
41TV1538	1989	Largely surficial prehistoric stone quarry/stone procurement and lithic scatter site common to area	Not recommended eligible by recorders	Site was recorded within the SH 45 ROW and extending north and south of the ROW; subsequent roadway construction has removed site from the ROW
41TV1540	1989 and 2006	Surficial prehistoric stone quarry/stone procurement site common to area	Not recommended eligible by recorders	Site is within the SH 45 and MoPac ROWs; destroyed by construction of both highways
41TV2188	2006 and 2012	Surficial lithic scatter of unknown prehistoric age; site type common to area	Determined ineligible within the 2006 cell tower footprint; remainder of site recommended ineligible	Site is within five meters (16.4 feet) of the SH 45 ROW
41TV2236	2006	Prehistoric site with surface artifacts and some shallowly buried materials	Determined ineligible 2006	Site is adjacent (i.e., within approximately 100 meters [328.1 feet]) to the SH 45SW ROW
41TV2237	2006	Surface scatter of prehistoric chipped stone common to area	Determined ineligible within the 2006 project area – unknown eligibility for the parts of site north and south of the 2006 project area	Site is approximately 100 meters (328.1 feet) northeast of the SH 45SW ROW
41TV2238	2006	Surface scatter of prehistoric chipped stone common to area	Determined ineligible 2006	Site is approximately 60 meters (196.9 feet) east of the SH 45SW ROW

Source: Atlas, 2014

Of the 13 known archeological sites within or adjacent to the proposed project APE, 10 sites (41TV1050, 41TV1053, 41TV1424, 41TV1537, 41TV1538, 41TV1540, 41TV2188, 41TV2236, 41TV2237, and 41TV2238) are prehistoric, one site (41TV1051: Ransom and Sarah Williams Farmstead) contains prehistoric and historic components and two sites (41HY177 and 41TV1049) are historic (see **Table 3.9-2**). As **Tables 3.9-2** and **3.9-3** indicate, parts of sites 41TV1051, 41TV1424, 41TV1537, 41TV1538, and 41TV1540 are within the proposed project APE; the remaining eight sites within the inventory are considered adjacent to the APE, as they are within approximately 100 meters (328.1 feet) or less of the project area.

One of the historic components of site 41TV1051 was determined eligible for inclusion in the NRHP and SAL designation, while the prehistoric component identified on the site was determined ineligible for SAL designation and inclusion in the NRHP. Previous survey, test excavations, and archival research determined that one of the historic components present at 41TV1051 represented the remains of the Ransom and Sarah Williams Farmstead dating to the late nineteenth century (Boyd 2009; Boyd et al. 2011). Ransom and Sarah Williams were former slaves who settled in the Austin area in the late nineteenth century and, based on the potential significance of the component, test excavations, extensive archival research, and data recovery excavations (i.e., mitigation) occurred on the parts of the site within the state-owned SH 45SW ROW at different times from 2007 to 2009 (Boyd 2009; Boyd et al. 2011). Based on these data, the significant parts of 41TV1051 within the SH 45SW ROW have been mitigated and no additional investigations at the site within the existing SH 45SW ROW are warranted, as per a TxDOT and THC coordination letter dated August 31, 2009 (**Appendix K: Agency Coordination**). A formal report of the results of the mitigation is currently in production.

Due to their primarily surficial character, the majority of the remaining sites within or adjacent to the proposed project APE lack research potential and have been recommended ineligible. The exception is site 41TV2188, parts of which have been determined ineligible while other parts are recommended ineligible (see **Table 3.9-3**).

State Antiquities Landmarks (SALs)

There are no SALs within or adjacent to the proposed project APE. However, the historic component of 41TV1051 associated with the Ransom and Sarah Williams Farmstead was determined worthy of SAL designation and eligible for inclusion in the NRHP (Boyd 2009; Boyd et al. 2011) (see **Table 3.9-3**). At this time, 41TV1051 has not been formally nominated for SAL designation or inclusion in the NRHP, nor is it listed on the NRHP or designated a SAL. However, the site extends west of the state-owned ROW and those parts of the site have not been evaluated for eligibility for inclusion in the NRHP or for SAL designation. Additional investigations to evaluate those parts of the site outside the ROW for SAL designation and NRHP eligibility are not warranted.

3.9.2 Direct Effects

Build Alternative

Direct impacts to archeological resources within the proposed project APE would occur at the portions of prehistoric and historic site 41TV1051, prehistoric site 41TV1424 that overlaps with the SH 45SW ROWand prehistoric sites 41TV1537 and 41TV1538 within the SH 45 ROW, as well as at prehistoric site 41TV1540 within the SH 45 and MoPac ROWs. The latter three sites (41TV1537, 41TV1538, and 41TV1540) have been destroyed in the state-owned ROW by previous roadway construction. The historic component at 41TV1051 associated with the Ransom and Sarah Williams Farmstead was determined eligible for inclusion in the NRHP and SAL designation; the prehistoric component of the site is not eligible for SAL designation or inclusion in the NRHP. It was determined that the 2009 mitigation of the part of the farmstead component within the proposed SH 45SW ROW exhausted its research potential and the proposed construction could proceed there without additional investigations (see **Appendix K: Agency Coordination**).

The proposed roadway construction would impact the parts of prehistoric site 41TV1424 that overlap with the SH 45SW ROW. However, site 41TV1424 is considered ineligible for inclusion in the NRHP or SAL designation due to low research potential based on its surficial character and lack of cultural features. As such, no archeological resources that could provide new or important data concerning prehistory would be impacted by the proposed construction at 41TV1424.

Sites 41TV1537 and 41TV1538 were previously identified within the SH 45 ROW between MoPac and Escarpment Boulevard. These sites were recommended ineligible for inclusion in the NRHP or SAL designation due to low research potential based on their surficial character and subsequently impacted by roadway construction. It is unlikely that archeological resources that could provide new or important data concerning prehistory would be impacted by the proposed construction at the previous locations of 41TV1537 and 41TV1538 within the SH 45 ROW.

Site 41TV1540 was previously identified within the SH 45 and MoPac ROWs; however, this site was destroyed by previous construction of both roadways.

In a TxDOT memorandum dated March 7, 2012, the segment of FM 1626 within the proposed project APE was determined, as part of a larger FM 1626 project extending from RM 967 to Brodie Lane, to contain no archeological resources and did not warrant additional investigations (**Appendix K: Agency Coordination**). As the proposed impacts to SH 45, MoPac, and FM 1626 for connections to the proposed SH 45SW facility would occur within existing developed ROW that has been largely previously surveyed and has been disturbed by previous surface and subsurface utilities and roadway construction, TxDOT determined that

additional investigations of the existing developed facilities would not be necessary (Budd, 2014). TxDOT further determined that the proposed project APE along SH 45SW on new location in the vicinity of previously recorded site 41TV1049, along existing Bliss Spillar Road ROW in the vicinity of previously recorded site 41HY177, and 6.43 acres along Bliss Spillar Road on new location required additional investigations (Budd, 2014).

The proposed improvements at Bliss Spillar Road were not included in the previous 2003 archeological survey of the proposed SH 45 Extension Project (now termed SH 45SW) ROW. Additional archeological survey investigations of this portion of the APE were conducted by TxDOT in 2014 to assess the potential for impacts to archeological resources in that location. Results of this survey indicate that no new archeological sites are present, but that one previously recorded site, 41TV1051, is located within this additional proposed project APE. As data recovery excavations at 41TV1051 were concluded in 2009 and TxDOT and THC concurred that construction could commence (Budd, 2009), no further survey or consultation with THC for this area is required.

No Build Alternative

Under the No Build Alternative, no project-related direct impacts to archeological resources within the proposed project APE would occur.

3.9.3 Encroachment-Alteration Effects

Eight archeological sites (41HY177, 41TV1049, 41TV1050, 41TV1053, 41TV2188, and 41TV2236 through 41TV2238) are adjacent to (i.e., within approximately 100 meters [328.1 feet] or less of) the proposed project APE. The sites would not be impacted (see **Table 3.9-3**) because additional ROW or temporary work areas for roadway construction are not necessary in those areas. In addition, these eight sites have either not been recommended eligible for SAL designation or inclusion in the NRHP or have been determined ineligible for SAL designation or inclusion in the NRHP (see **Table 3.9-3**). Additional investigations at the eight adjacent sites would not be warranted. If additional ROW is necessary in other locations where archeological survey investigations have not occurred, additional archeological survey in such areas would be necessary to assess the potential for impacts to archeological resources.

3.10 Historic Resources

Cultural resources include structures, buildings, archeological sites, districts, cemeteries, and objects. Federal and state laws often require consideration of cultural resources during project planning. State laws including the ACT apply to this proposed project (see **Section 3.9**). The historic APE is the proposed ROW for non-federal projects (TAC 26.25: 2014).

3.10.1 Existing Conditions

The proposed historic resources study area for SH 45SW is from SH 45 and MoPac in the northwest to FM 1626 in the southeast. The study area straddles Travis and Hays counties and is partially within the Austin city limits. For historic resources studies, the typical study area is 1,300 feet from new location alternative alignments. This is used as a guide to provide contextual background information about an area and to help identify previously recorded resources. The northern portion of the proposed study area is characterized by large, undeveloped sections of land surrounded by late twentieth century single family suburban housing. The current construction demand is a result of Austin's rapid population growth, which has expanded residential and commercial development into the rural areas surrounding the city. The SH 45SW ROW, project study area, and historic resources APE are shown on **Figure 3.10-1**.

Preliminary research of the proposed SH 45SW historic resources study area in Travis and Hays counties, Texas was conducted by project architectural historians. The Texas Historic Sites Atlas Online was examined to determine if any previously documented resources occur within the proposed study area. Research revealed no previously documented NRHP sites, National Historic Landmarks (NHLs), or SALs. In addition, no previously identified historic districts or landmarks appear to be in the vicinity. See **Figure 3.10-1**.

No previously identified resources were found within the 1,300-foot study area or APE according to the Texas Historic Sites Atlas (Historic Atlas). Previous studies were conducted by Knight and Associates, Inc. and include two separate reports: *Historic Resources Survey Report for State Highway 45 Southeast*, and *Historic Resources Survey Report for State Highway 45 Southeast, the Williams and Woods Tracts*. These documents provide contextual background for the study area as well as the identification of historic resources in the vicinity. At this time, no known historic or historic-age resources appear in the APE.

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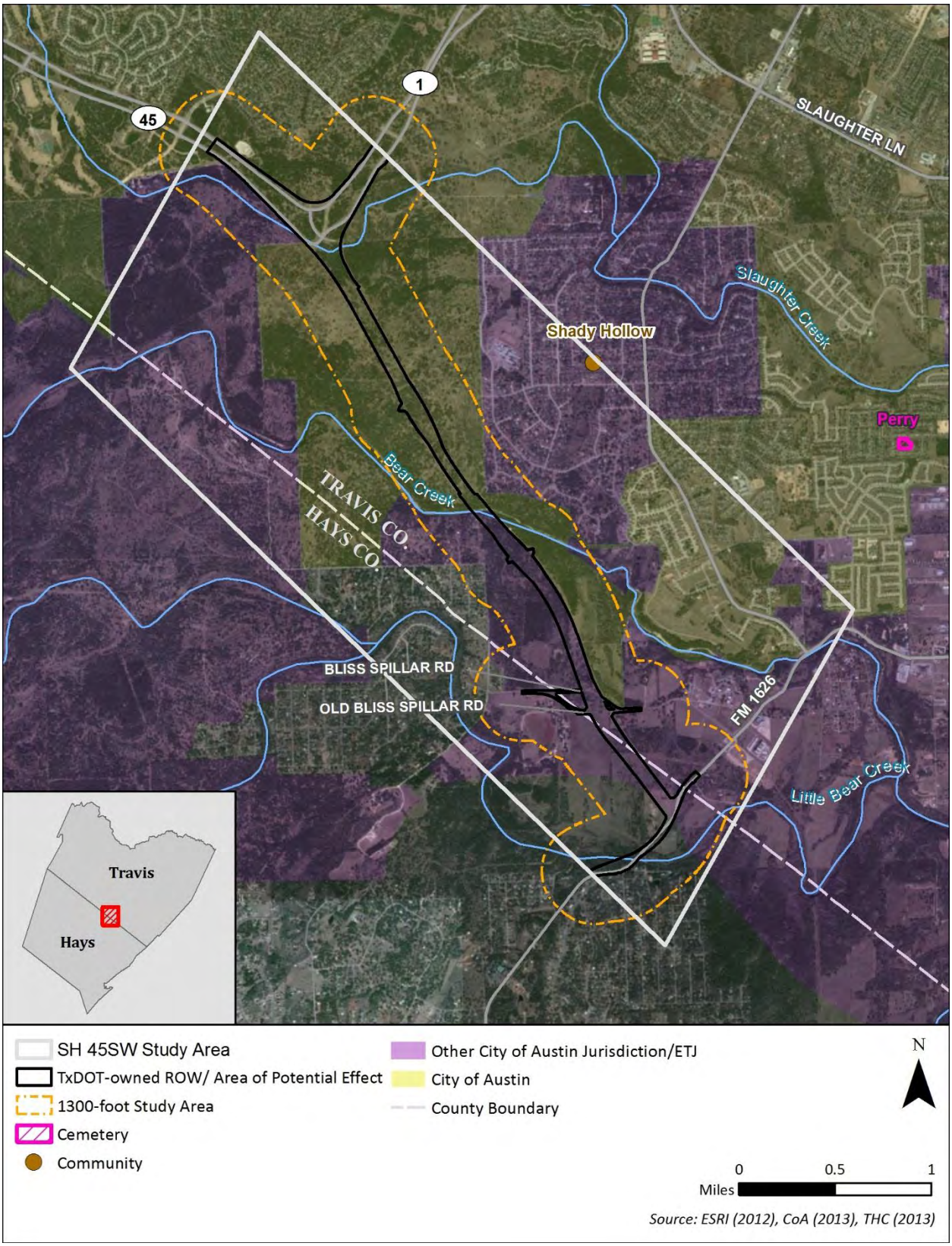
Figure 3.10-1: Project Location for Historic Resources



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3.10.2 Direct Effects

Build Alternative

A search of the Historic Atlas maintained by THC was conducted in order to identify NRHPs, NHLs, Recorded Texas Historic Landmarks (RTHLs), Official Texas Historical Markers (OTHMs), SALs, cemeteries, or other cultural resources that may have been previously recorded in the APE or 1,300-foot study area.

No previously identified resources were found within the APE or 1,300-foot study area according to the Historic Atlas. Previous studies were examined for their ability to provide contextual background for the study area as well as help historians identify historic resources in the vicinity. At this time, no known historic or historic-age structures appear in the APE.

Project staff visited the proposed project ROW and examined various aerial maps; no indications of early above ground settlement-era or later resources were identified. In compliance with the Antiquities Code of Texas, a TxDOT historian determined that no historic properties are present in the APE. THC concurred with these findings on May 5, 2014 (see Project Coordination Request in **Appendix K: Agency Coordination**).

No Build Alternative

Under the No Build Alternative, no project-related impacts to historic resources within or adjacent to the SH 45SW APE would occur.

3.10.3 Encroachment-Alteration Effects

No NRHP-eligible historic resources or SALs are known from the proposed project vicinity; thus, encroachment-alteration effects are not anticipated.

3.11 Hazardous Materials

3.11.1 Existing Conditions

A review of selected environmental regulatory databases published by federal and state agencies was conducted, in general accordance with TxDOT standards, to determine the potential for hazardous materials in the vicinity of the proposed project. In addition, an Initial Site Assessment consisting of two windshield and walking surveys of the proposed project limits and surrounding area was conducted to confirm the location of the listed facilities and to observe the existing general environmental conditions both at these facilities and within the proposed project limits.

The initial regulatory database search was conducted by GeoSearch LP in 2011 (GeoSearch). Due to the date of the initial database search, an updated database search was conducted on December 14, 2014. The second review, prepared by EDR, was conducted in order to capture any new information that might have appeared since the first database search in 2011. The results of the EDR review are incorporated into this report.

The environmental databases provide information on regulated facilities that are listed as having a past or present record of actual or potential environmental impact. These "regulatory listings" are limited, and include only those sites that are known to the regulatory agencies at the time of publication to be contaminated or in the process of evaluation for potential contamination (GeoSearch, 2011). It should be noted that the database search area originally extended from MoPac to IH 35. The current database search area is limited to the original proposed project area between SH 45 and FM 1626, and the areas within one mile of the original proposed project area between SH 45 and FM 1626 (**Figure 3.11-1** and **Figure 3.11-2**).

Figure 3.11-1: HazMat Database Search Area Aerial Photo and Radius Results

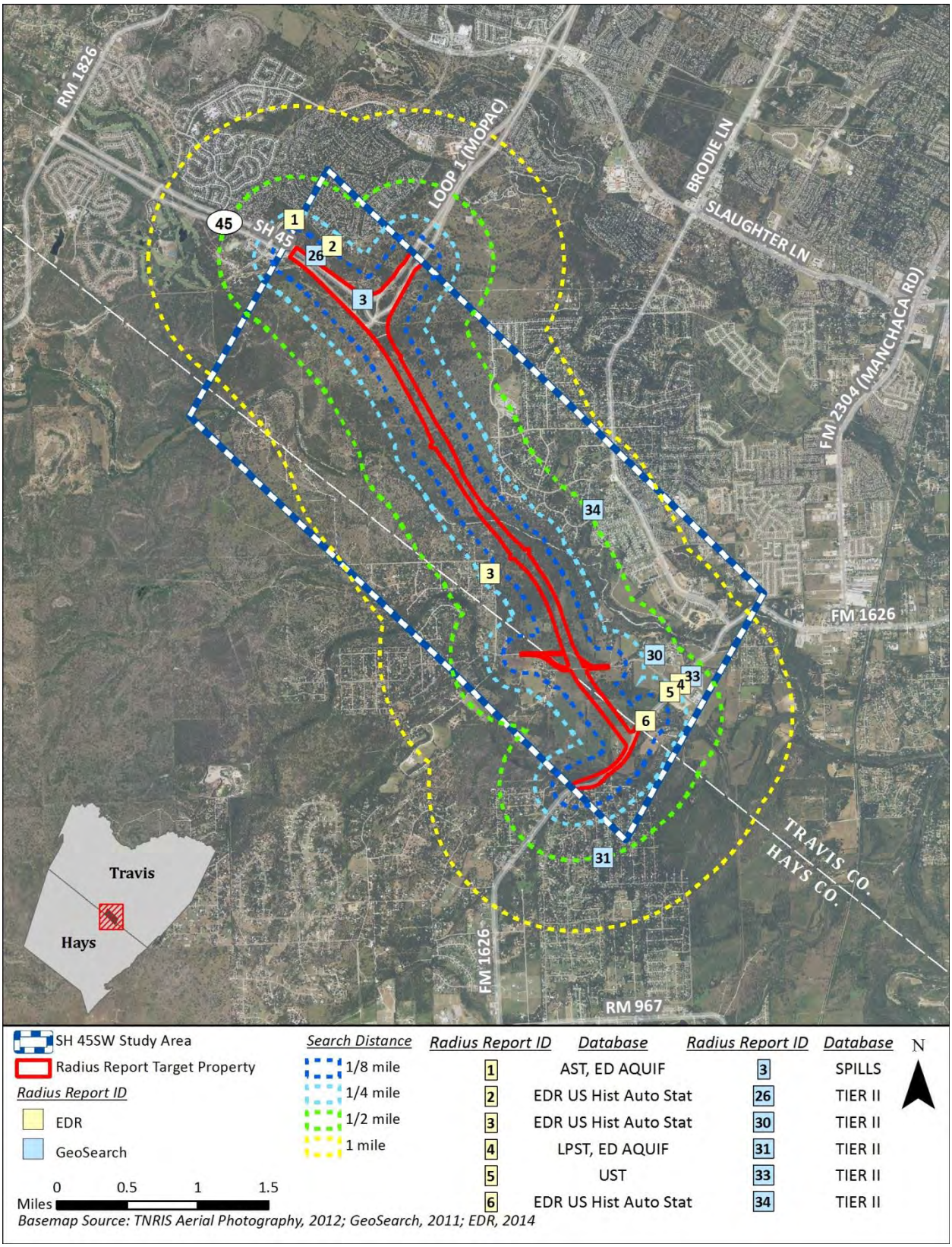

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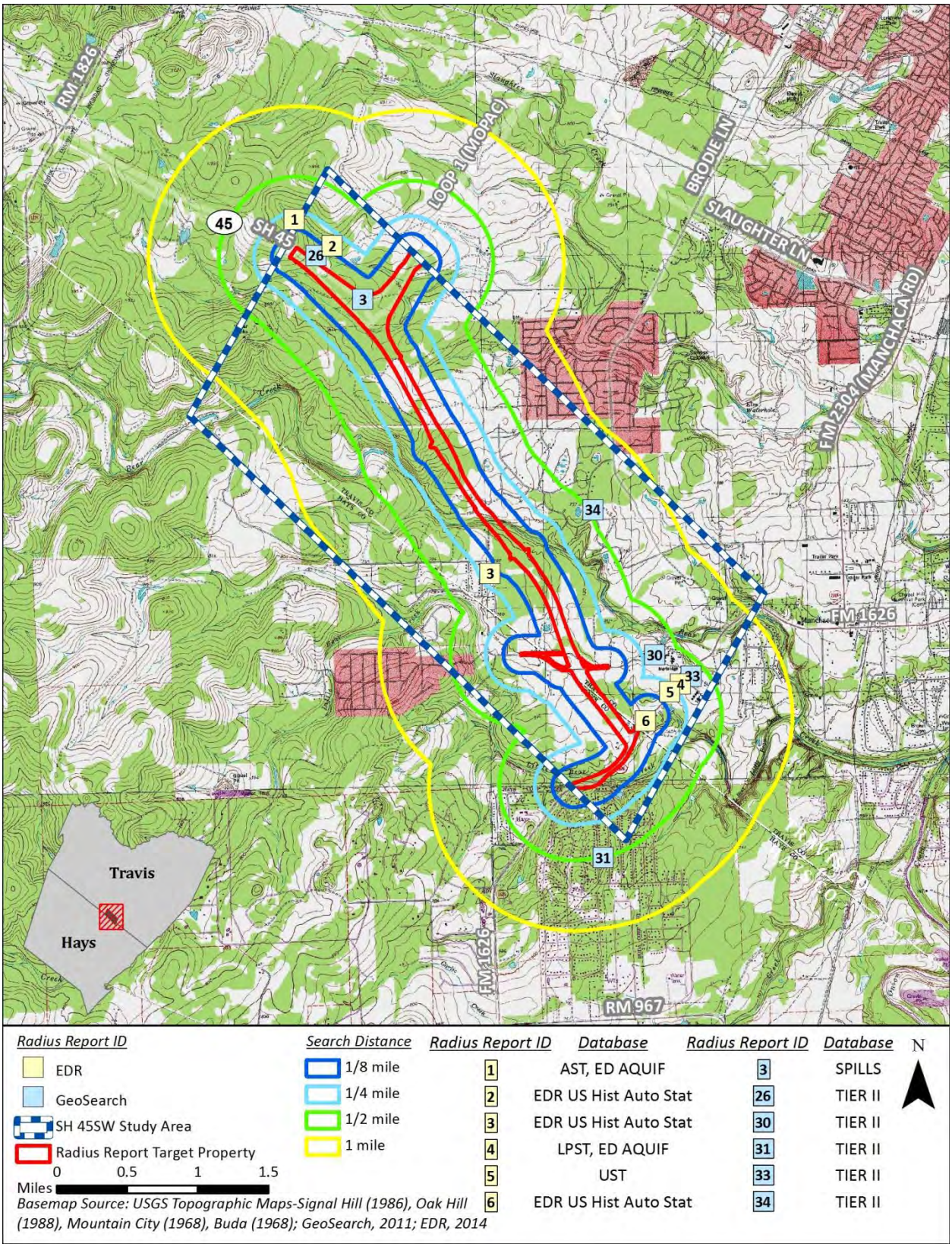
Figure 3.11-2: HazMat Database Search Area Topographic Map



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The following is a list of the standard federal and state environmental and tribal record sources or databases that were reviewed for this study. The databases were searched in general accordance with the recommended minimum search distances and criteria referenced in the American Society of Testing and Materials (ASTM) Standard Practice E 1527-05 for the 2011 GeoSearch database search and the ASTM Standard Practice E 1527-13 for the 2014 EDR database search (due to the fact that ASTM E 1527-13 did not exist at the time of the first database search). The complete hazardous materials database search report is available at the TxDOT Austin District office.

Federal Databases

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) established the EPA National Priorities List (NPL) of federal "Superfund" sites. This list identifies Superfund sites that have been designated by the EPA as national priority cleanup sites and targeted for immediate action due to their high assigned ranking. The delisted NPL is a database that includes NPL sites that have undergone remediation, where the original assessment was inaccurate, or where the site is no longer appropriate for inclusion on the NPL.

The EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) lists and identifies suspected contamination sites throughout the nation. CERCLIS contains information on sites identified by the EPA as known or suspected abandoned, inactive, or controlled hazardous waste sites that may require cleanup. However, a facility or site on this list does not necessarily have environmental problems.

The EPA CERCLIS No Further Remedial Action Planned (NFRAP) list identifies CERCLA sites where no contamination was found, contamination was removed quickly without the need for site placement on the NPL, or the contamination was not serious enough to require federal action or NPL consideration.

The EPA Resource Conservation and Recovery Information System (RCRIS) Generators list is the EPA database of facilities that generate or transport hazardous waste. This list also serves to track the status of hazardous waste treatment, storage, and/or disposal facilities regulated under Resource Conservation and Recovery Act (RCRA), as well as Treatment, Storage, and Disposal (TSD) facilities that are currently conducting or have conducted corrective action.

The EPA Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The database contains information from spill reports made to federal authorities, including the EPA, the U.S. Coast Guard, the National Response Center and the U.S. Department of Transportation.

State Databases

The TCEQ Superfund Registry identifies potential hazardous waste facilities and areas that may constitute endangerment to public health and safety.

The TCEQ Registered Petroleum Storage Tank (PST) list is an inventory of registered PSTs located within the state. Both underground storage tanks (USTs) and aboveground storage tanks (ASTs) are included in this report.

The TCEQ Leaking Petroleum Storage Tank (LPST) list identifies properties that have been reported to the state as having known leakage from underground tanks.

The TCEQ Solid Waste Municipal Landfill Facility (SWMLF) list is a database that tracks permits and registrations for landfills, transfer stations, sludge application sites, illegal dump sites, recycling facilities, medical waste generators, and transporters.

TCEQ's Risk Reduction Program requires the placement of institutional and engineering controls (IEC) on an affected property as part of a response action. Institutional controls include legal documents recorded in the deed records, and engineering controls include devices to prevent access, exposure, or migration of contamination, such as caps and barriers.

The TCEQ Voluntary Cleanup Program (VCP) list contains an inventory of reported sites that have entered the VCP. The VCP was created primarily to provide incentives to encourage the cleanup of thousands of contaminated sites in Texas that require remedial action in order to complete real estate transactions. Although review of the VCP list is not required by ASTM, it is included here because facilities that appear on the VCP list may not be shown in other regulatory database listings.

The TCEQ SPILLS list is a database of hazardous and potentially hazardous substances released in the environment.

The Texas Tier II in the Department of State Health Services is the state repository for Emergency Planning and Community Right-to-Know Act (EPCRA)-required Emergency Planning Letters, which are one-time notifications to the state from facilities that have certain extremely hazardous chemicals in specified amounts. The Program is also the state repository for EPCRA/state-required hazardous chemical inventory reports called Texas Tier Two Reports.

EDR Proprietary Database

EDR's proprietary records are collected from a search of national collections of business directories and other collected listings of potential sites that typically create environmental concerns, but may not show up in government records searches.

The EDR US Historical Auto Station database records consist of, but are not limited to, gas or gasoline related businesses, filling stations, service stations, and auto-related business including auto repair and auto service stations.

Regulatory Database Review

Review of the regulatory databases indicates that no federally listed facilities are located within the database search area. However, nine state-listed facilities were determined to be located within the database search area and are shown on **Figure 3.11-1** and **Figure 3.11-2**:

- One SPILLS site,
- Five Tier II Chemical Reporting Program Facility (TIER II) sites,
- One AST site,
- One UST site, and
- One LPST site.

In addition, three sites (EDR-2, EDR-3 and EDR-6 in **Table 3.11-1**) are identified in **Figures 3.11-1 and 3.11-2** as having been collected from the EDR US Historical Auto Station (EDR US Hist Auto Sta) database. During the January 2015 windshield survey, no evidence of any of the three EDR US Historical Auto Station sites was found.

The remaining facilities listed in the other state and federal regulatory databases are located outside the standard ASTM record sources and search distance criteria, and are therefore not considered a potential environmental concern or a recognized environmental condition (REC) pertaining to the proposed action. A REC is defined by the ASTM E1527-13 as "the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or into the ground, ground water, or surface water of the property" (ASTM, 2013). It should be noted that since ASTM E1527-13 did not exist in 2011, the original database search was based on ASTM E1527-05.

The facilities' locations and current statuses are summarized in **Table 3.11-1**. The entire database search report is on file at the TxDOT Austin District office.

Table 3.11-1: Environmental Database Radius Results

Radius Map ID	Property Name and Address	Distance/ Direction from Database Search Area	Database(s)	Status / Information
EDR-1	Circle C Fire EMS Station 11401 Escarpment Blvd, Austin, TX 78739	Approximately 500 feet; NE	AST	AST: This facility was listed as having two above ground storage tanks. Each tank has a 500 gallon capacity and contains diesel gasoline used for fleet refueling. The tanks were installed in 2004 and have been in use since 2005.
EDR-2	Autobody Shop 5927 Mordred Lane, Austin, TX 78739	Approximately 500 feet; SW	EDR US Hist Auto Stat	EDR US Hist Auto Stat: An EDR proprietary database using information for historical auto related stations, etc. There was no evidence of this establishment during the windshield survey of the project area.
EDR-3	Southwest Auto Repair, 13112 Fencerail Road, Manchaca, TX 78652	Approximately 0.08 mile; W	EDR US Hist Auto Stat	EDR US Hist Auto Stat: An EDR proprietary database using information for historical auto related stations, etc. There was no evidence of this establishment during the windshield survey of the project area.
EDR-4	Stripes 1548, 2120 FM 1626, Manchaca, TX, 78652	Approximately 0.23 mile; NE	LPST	LPST: This leaking petroleum storage tank is identified as Tank #1 at this facility and holds 10,000 gallons of gasoline. A leak was identified in 2014 and it was determined that although groundwater was impacted, there was no apparent threat or impacts to receptors. The tank was repaired and is currently in use. Map ID sites 4 and 5 are the same business location.
EDR-5	Stripes 1548, 2120 FM 1626, Manchaca, TX 78652	Approximately 0.23 mile; NE	UST	UST: This facility is a gas station with four underground storage tanks. Tanks #1-3 hold 10,000 gallons of gasoline, tank four holds 10,000 gallons of diesel gasoline. All four tanks were installed in 1985. Map ID sites 4 and 5 are the same business location.
EDR-6	Advance Autobody, 2203 FM 1626, Manchaca, TX, 78652	Approximately 0.25 mile; S	EDR US Hist Auto Stat	EDR US Hist Auto Stat: An EDR proprietary database using information for historical auto related stations, etc. There was no evidence of this establishment during the windshield survey of the project area.

Table 3.11-1: Environmental Database Radius Results cont'd

Radius Map ID	Property Name and Address	Distance/ Direction from Database Search Area	Database(s)	Status / Information
GS-3	MoPac at SH 45, Travis County, TX 78739	Within database search area	SPILLS	SPILLS: Greater than 100 gallons of asphalt or road oil/tar were spilled at the intersection of SH 45 and Loop 1 on May 6, 1997. The affected river basin was the Colorado River Basin. No further details are provided. There is no closure date given for this incident.
GS-26	Escarpment Substation 5900 SH45, Austin, TX 78739	0.08 mile; NW	TIERII	TIER II: This facility was listed as an electric services and electric bulk power transmission and control type in 2010. Chemicals listed as stored at the facility include: sealed in lead acid battery, electrical insulating oil, and sulfuric acid. Amounts for each chemical are not provided. Chemicals are listed as being stored in electrical equipment at the facility. This facility is reported as passing all validation checks. No further information is provided.
GS-30	Sharp Propane 2310 Bliss Spillar Road, Manchaca, TX 78652	0.35 mile; SE	TIER II	TIER II: This facility was listed as a liquefied petroleum gas (bottle gas) dealer in 2006 and again in 2010. Chemicals listed as stored at the facility include: liquefied petroleum gas. Three 2,000-gallon steel tanks were reported at the facility in 2010. This is assumedly where the liquefied petroleum gas was stored. This facility is reported as passing all validation checks. No further information is provided.
GS-31	Cimarron Park Water Co. 406 Edgewood Drive, Buda, TX 78610	0.61 mile*; SE	TIER II	TIER II: This facility was listed as a water supply company from 2007 to 2010. Chemicals listed as stored at the facility include: 150 pounds of chlorine gas. The chemical is listed as being stored in well site 1 at the address 12712 Eagle Nest Drive. This facility is reported as passing all validation checks. No further information is provided.
GS-33	Manchaca Substation 2111 W FM 1626, Manchaca, TX 78652	0.43 mile; SE	TIER II	TIER II: This facility was listed as an electrical service and electrical bulk power transmission and control facility in 2010. Chemicals listed as stored at the facility include: electrical insulating oil. The chemical is listed as being stored in electrical equipment within the facility. This facility is listed as passing all validation checks. No further information is provided.

Table 3.11-1: Environmental Database Radius Results cont'd

Radius Map ID	Property Name and Address	Distance/ Direction from Database Search Area	Database(s)	Status / Information
GS-34	Shady Hollow Estates Water Plant 12305 Edward Hollow, Manchaca, TX 78652	0.44 mile; SE	TIER II	TIER II: This facility was listed as a water supply and irrigation systems facility in 2010. Chemicals listed as stored at this facility include: chlorine gas. The amount of chlorine gas stored is not listed. The chemical is listed as being stored in the chlorine room. This facility has passed all validation checks. No further information is provided.

Sources: Radius Map IDs: GS-3, 26, 30, 31, 33, and 34 from GeoSearch, 2011. Radius Map IDs: EDR-1, 2, 3, 4, 5, and 6 from EDR, 2014.

** This distance was recalculated due to changes to the proposed database search area after submittal of the radius report.*

A windshield survey of the database search area was performed on August 12, 2013 to verify the results of the GeoSearch Radius Report database search area which is limited to the proposed project area between MoPac and FM 1626, and the areas within up to one mile of the original proposed project area between MoPac and FM 1626.

Sharp Propane (Map ID GS-30) was found to no longer be at the location indicated or in the adjacent area. The Cimarron Park Water Company (Map ID GS-31) was not located on Edgewood Drive but at 12712 Eagle Nest Drive, which is still located within the one-mile search radius around the database search area. No evidence of the spill at SH 45 and MoPac was seen during the windshield survey. Other facilities found within the database search area and within the one-mile radius include gas stations, automotive repair facilities, residential buildings, commercial buildings, agricultural facilities, and light industrial facilities. The residential and commercial buildings within the database search area could contain asbestos containing materials (ACM) or lead based paints (LBP). There are also possible petroleum and solvent hazardous material concerns based on the presence of commercial, agricultural, and light industrial facilities within the database search area.

Additionally, since the 2011 GeoSearch database search was conducted, there has been a LPST recorded at the Sac-n-Pac/Valero gas station at 2120 FM 1626 in Manchaca. In a letter dated July 23, 2014, TCEQ informed TxDOT ENV that there has been a release of gasoline from the underground storage tanks and that shallow groundwater at a depth of seven feet has been impacted. Discussions with TCEQ indicate that a Phase II site assessment was completed in November 2013 and that clean-up of this site is currently on-going (J. Robinson, P.G., personal communication, August 4, 2014). This site was captured through the subsequent database search by EDR in December 2014 and is listed in **Figure 3.11-1** as Radius Map ID EDR-4. The sites of Map IDs EDR-4 and EDR-5 are the same business location which contains

four USTs. Only one of the USTs at the location is the LPST (Map ID EDR-4); the remaining four USTs are Map ID EDR-5.

A review of the Texas Railroad Commission (TRRC) online geographic information system (GIS) database revealed no oil wells, gas wells, or pipelines within the database search area (TRRC, 2013). Review of BSEACD data indicates one water well located within the database search area (**Figure 3.11-3**).

Current aerial photos and topographic maps (**Figure 3.11-1** and **Figure 3.11-2**) indicate that no obvious hazardous material issues are located within the database search area. Based on current aerial photos and topographic maps, the database search area is largely undeveloped with residential and some agricultural, commercial, and light industrial buildings along the boundaries of the area.

No evidence of environmental degradation or other potential environmental concerns was evident during the assessment.

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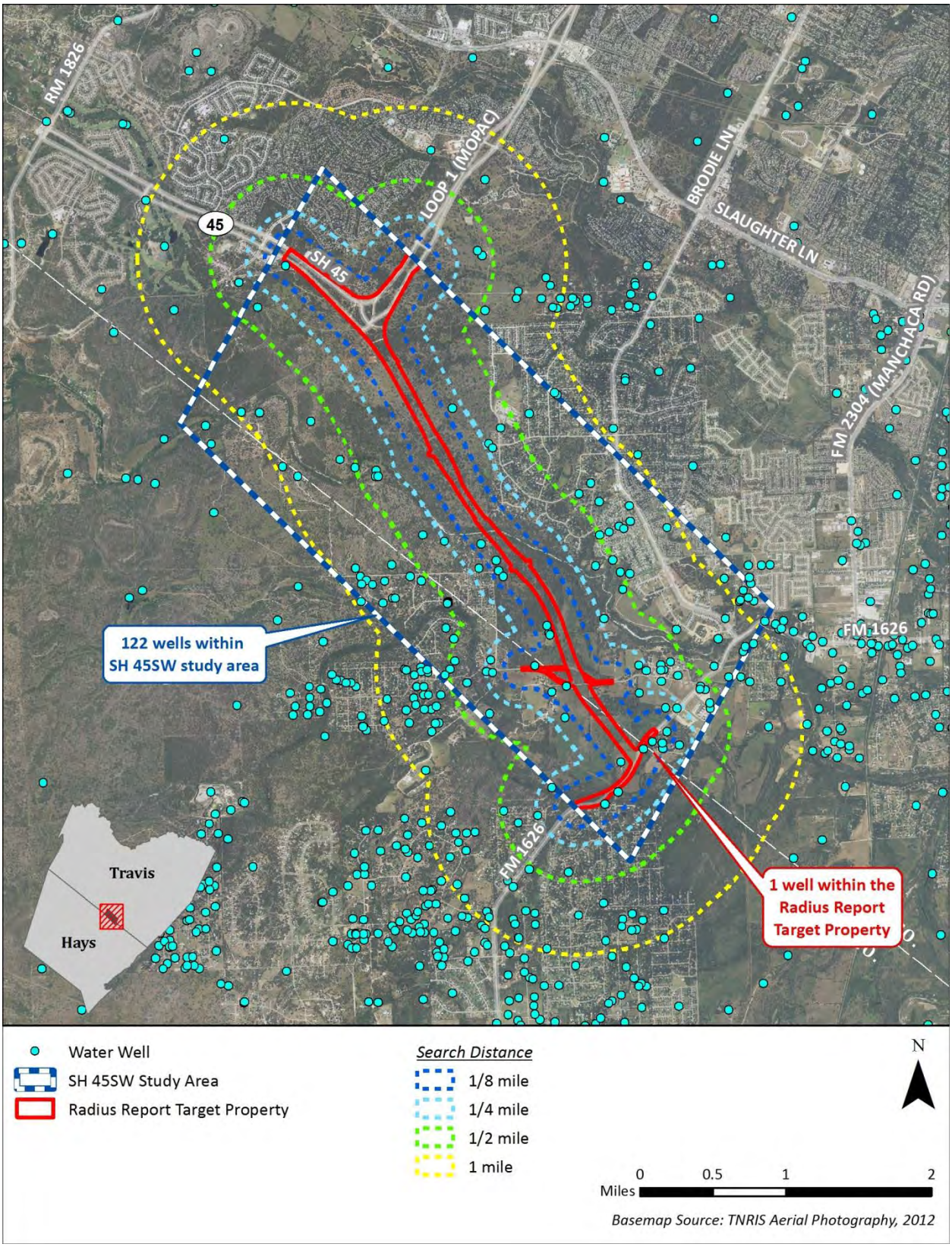
Figure 3.11-3: Water Well Locations



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3.11.2 Direct Effects

Build Alternative

Federal and state regulatory environmental databases were searched in general conformance with the recommended search distances referenced in ASTM Practice E 1527-13. Review of this information indicates that nine state and local facilities are located within one mile of the SH 45SW Radius Report Target Property (see **Table 3.11-1**). Of these nine sites, one is listed as a SPILLS site, five are listed as TIER II sites, one is listed as an AST and one is listed as a UST as well as an LPST. A sixth site, also listed as a TIER II facility, falls outside of the standard ASTM 0.5 mile search distance criterion and is therefore not considered a potential environmental concern or REC pertaining to the proposed action.

The regulatory sites are located along or adjacent to the proposed project corridor. The following summarizes the results of the review of state and federal regulatory data.

The site at Map ID GS-3 (**Figure 3.11-2**) is designated as a SPILLS site. Greater than 100 gallons of asphalt or road oil/tar was released at this site near the intersection of the existing SH 45 and Loop 1 interchange on May 6, 1997 (see **Table 3.11-1**). There was no closure date given for this incident in the database search. Edwards Aquifer Permits (EAP) at this location (SH 45 at MoPac) indicate that two permits were issued to TxDOT, one in 1998 and another in 1999, with the location found to be in compliance. However, the EAPs are not related to the SPILLS site. No further information about this incident could be found on the TCEQ Central Registry or in other online searches. It is therefore unclear how the aftermath of the spill was handled. Of all the sites identified, this site has the greatest potential to impact the proposed project through either contaminated soil or groundwater. In the event that construction crews encounter contaminated soil or groundwater during project implementation, all activities must cease until contaminated materials are properly removed from the area and taken to an appropriate disposal site in compliance with applicable federal, state, and municipal laws.

Five sites within the ASTM search radius were all classified as TIER II sites (Map IDs GS-26, GS-30, GS-31, GS-33, GS-34 on **Figure 3.11-2**). There are no reported spills or notices of violation associated with these sites and the sites have reportedly passed all of their validation checks. It is therefore unlikely that these sites would impact the proposed action.

As discussed in **Section 3.11.1**, there has been a LPST recorded in the database search area at 2120 FM 1626 in Manchaca (LPST ID No. 119353). This site is identified as Map ID EDR-4 in **Figures 3.11-1** and **3.11-2**. Groundwater has been affected at a depth of seven feet. This site is approximately 0.23 mile northeast of the proposed SH 45SW corridor. At this time, TCEQ does not know how large of an area is affected, so it is unclear whether this site would affect the SH 45SW project. Clean up is currently on-going. However, the EDR search

results from December 2014 reported that although groundwater was impacted, there is no apparent threat or impacts to receptors.

No other areas of concern were identified during site reconnaissance of the database search area on August 12, 2013 and January 2, 2015 or of the proposed project ROW on December 19, 2013. During the August and January surveys, qualified environmental personnel conducted a windshield survey of the database search area based on the results of the database searches from GeoSearch and EDR. The December survey of the proposed project ROW was conducted by qualified environmental personnel that walked the entirety of the ROW.

Existing bridges at Escarpment Boulevard, South Bay Lane, and FM 1626 may be impacted by the proposed project. Prior to project letting, these structures would be inspected for ACMs and LBP. Asbestos and lead based paint issues, if any, would be addressed prior to construction. If suspected asbestos material is encountered, a mitigation plan for the removal and disposal of materials containing hazardous materials would be developed according to applicable federal, state, and local regulations. If lead based paint is discovered, plans would be developed to address work safety, material recycling, and management of paint-related wastes as necessary.

The storage and use of hazardous materials would be necessary during construction of the proposed project. Use and handling of hazardous materials associated with construction machinery and equipment would likely pose a minimal risk to the environment if appropriate safety measures and BMPs were applied. On-site storage of hazardous materials within the proposed project area would be short-term and closely monitored.

TxDOT would agree to implement measures that mitigate the potential effects of the proposed highway. Those measures included constructing hazardous material traps and filtration ponds, placing signs to educate the public about the location of the Recharge Zone along the highways, limiting highway access points and their associated secondary impacts, and completing a study of roadway runoff contamination, as previously discussed in **Section 3.6.2** and **3.7.3**.

The COA Watershed Protection Department completed a dye trace study in 2010 to simulate accidental spills in selected portions of the proposed project area. COA published the results of the dye trace study in a report dated October 2012, concluding that,

> [a]n accidental spill from the SH 45SW and Loop 1 South intersection area can be expected to recharge into the Edwards Aquifer and initially arrive at Barton Springs within two to four days under high aquifer discharge conditions. Slower initial arrival times of about three weeks can be expected under drought conditions, on the basis of previous studies... (COA, 2012, p. 25).

In response to the community's sensitivity to potential future impacts to the Edwards Aquifer resulting from possible accidental spills from vehicles traveling along SH 45SW and a desire to plan for the implementation of appropriate measures during highway construction and operation to protect the aquifer, TxDOT compiled and analyzed roadway spill data from federal, state, county, and city databases for the time period 2003 to 2012 to quantify the probability of an accidental spill of hazardous liquids from mobile sources (i.e., vehicles, tanker trucks, etc.) occurring within the proposed 3.5-mile section of highway. TxDOT calculated that a maximum of 5.6 hazardous liquids spills per billion vehicle miles traveled occurred on one of three existing parkways and highways in Travis County that are most similar to the proposed SH 45SW during the 2003 to 2012 time period. One spill occurred on SH 45SE (IH 35 to SH 130) during its 3.7-year operational history with approximately 0.18 billion vehicle miles traveled. No spills occurred on either of the other two analogous parkways or highways over a 10-year period with approximately 2.58 billion vehicle miles traveled (TxDOT, 2014).

In June 2011, Texas Tech University, under contract to TxDOT, published a report (TxDOT, 2014) that analyzed the occurrence and statistics of hazardous material spill incidents for mobile sources along *all* Texas highways (not only those in Travis County) for the five-year period of 2002 to 2006, as compiled by TCEQ. The report examined the statistical distribution of hazardous liquid spill volumes. They found that hazardous liquid spills observed on roadways in the entire state during 2002-2006 were distributed according to the following percentiles:

- 50 percent – 60 gallons or less
- 67 percent – 100 gallons or less
- 83 percent – 300 gallons or less
- 90 percent – 820 gallons or less
- 95 percent – 2,500 gallons or less
- 99 percent – 20,000 gallons or less

This statistical distribution includes areas outside Travis County that typically experience more frequent liquids transportation on roadways, especially associated with commerce occurring in and between large industrial complexes. As such, the percentiles likely represent a conservative (overstated) condition with respect to actual conditions in Travis County. In other words, the same percentiles for Travis County alone would likely reflect smaller spills.

Furthermore, the probability of the occurrence of a spill greater than 10,000 gallons (only half the 20,000 gallon value mentioned above) is extremely low due to the fact that the amount of hazardous material that may be legally shipped on public highways is regulated by 23 CFR Section 658, and federal highway regulations limit the weight of a motorized cargo vehicle to 80,000 pounds gross weight. This means that a tanker truck is limited to approximately 10,000 gallons of liquid or less depending on the specific gravity of the material (TxDOT, 2014). This indicates that a spill of greater than 10,000 gallons would be extremely rare and require, for example, two tanker trucks to be involved in an incident and simultaneously spill. Nonetheless,

industry-leading hazardous material traps and filtration ponds would be engineered for the proposed project to more than adequately confine and contain the appropriate worst-case spill volume to ensure adequate protection of the environment (TxDOT, 2014). Details of traps and ponds were previously discussed in **Sections 3.6.2** and **3.7.3**.

Although hazardous material cargo would not be explicitly prohibited from using SH 45SW, the Mobility Authority would prohibit permitted load hazardous material vehicles from driving on the facility (S. Beal, personal communication, October 17, 2014).

ASTs for oil and diesel fuel are typically used for equipment and vehicles used in roadway construction. Any potential ASTs within the database search area would be regulated and would require control measures for spills and leaks in compliance with applicable TxDOT, TCEQ, and BSEACD standards. Impacts from ASTs, equipment, and vehicles would likely be minimal and would not pose a substantial threat to the environment.

There are no known oil/gas well sites within the database search area. Likewise, there are no known oil pipelines traversing the database search area. Therefore, it is unlikely that the database search area would be impacted by spills or other incidents involving oil/gas wells or pipelines.

Debris piles were observed in the state-owned ROW during the field surveys. Some of these piles may contain or have contained petroleum products. However, the quantities of these products would likely have been small and would not have resulted in significant contamination of soil or groundwater. Debris piles would be removed prior to construction. If contaminated soil were encountered, it would be removed from the proposed project area and disposed of according to applicable local, state, and federal laws. Appropriate training of those involved in the construction of the proposed project would be conducted prior to the beginning of construction activities.

No Build Alternative

If no improvements were made to the database search area, there would be no project-related impacts to regulated state and federal hazardous material sites, as conditions would remain unchanged.

3.11.3 Encroachment-Alteration Effects

Encroachment-alteration effects are those that affect the functions of the natural environment due to proposed project features. Hazardous materials are not considered to be a natural environment or a function of a natural environment. Therefore, encroachment-alteration effects in relation to hazardous materials would not occur under either the Build or No Build Alternatives.

3.12 Visual and Aesthetic Qualities

Although this is not a federal project, the process used to assess the visual and aesthetic impacts for the proposed project follows the guidelines outlined in the *FHWA's Visual Impact Assessment for Highway Projects* (FHWA, 1988).

3.12.1 Existing Conditions

Project Setting

The visual environment resource area establishes the general visual environment of the proposed project. The following description of the visual environment addresses both land form and land cover. The visual environment resource area matches the proposed project study area and is located in Travis and Hays counties. Approximately 47 percent of the study area is developed with a mix of urban and suburban structures; the remaining 53 percent is undeveloped (see **Section 3.1.1** for a discussion of general land use types in the study area).

The study area is located within southern Travis and northern Hays counties. As described in **Section 3.8**, the study area lies on the border of the Level III Edwards Plateau and Texas Blackland Prairie, and on the border of the Level IV Balcones Canyonlands and Northern Blackland Prairie ecoregions (EPA, 2013). Level IV ecoregions are a subcategory of Level III ecoregions, meaning that the Balcones Canyonlands is a subregion of the Edwards Plateau and the Northern Blackland Prairie is a subregion of the Texas Blackland Prairie. The Edwards Plateau is a dissected limestone plateau with a sparse network of perennial streams. The Texas Blackland Prairie is distinguished from surrounding ecoregions by its fine-textured, clayey soils and predominantly prairie potential natural vegetation. The Balcones Canyonlands ecoregion forms the southeastern boundary of the Edwards Plateau. This ecoregion is highly dissected by erosions from springs, streams, and rivers flowing both above and below ground. Percolation through the limestone contributes to the Edwards Aquifer recharge. The Balcones Canyonlands supports a variety of endemic plants and has a higher representation of deciduous woodland than the rest of the Edwards Plateau. The vegetation found within the study area is consistent with that described within the Level III and Level IV ecoregions discussed above. A more detailed description of the vegetation is given in **Section 3.8**.

Landscape Units

A landscape unit is a portion of the regional landscape of the resource area and can be thought of as an outdoor room that exhibits a distinct visual character. A landscape unit would often correspond to a place or district that is commonly known among local viewers. These landscape units provide the framework for analyzing the effects of the proposed project. The landscape units for the proposed project are shown in **Figure 3.12-1** and include the Open Space Landscape Unit and the Urban/Suburban Landscape Unit, which are described below.

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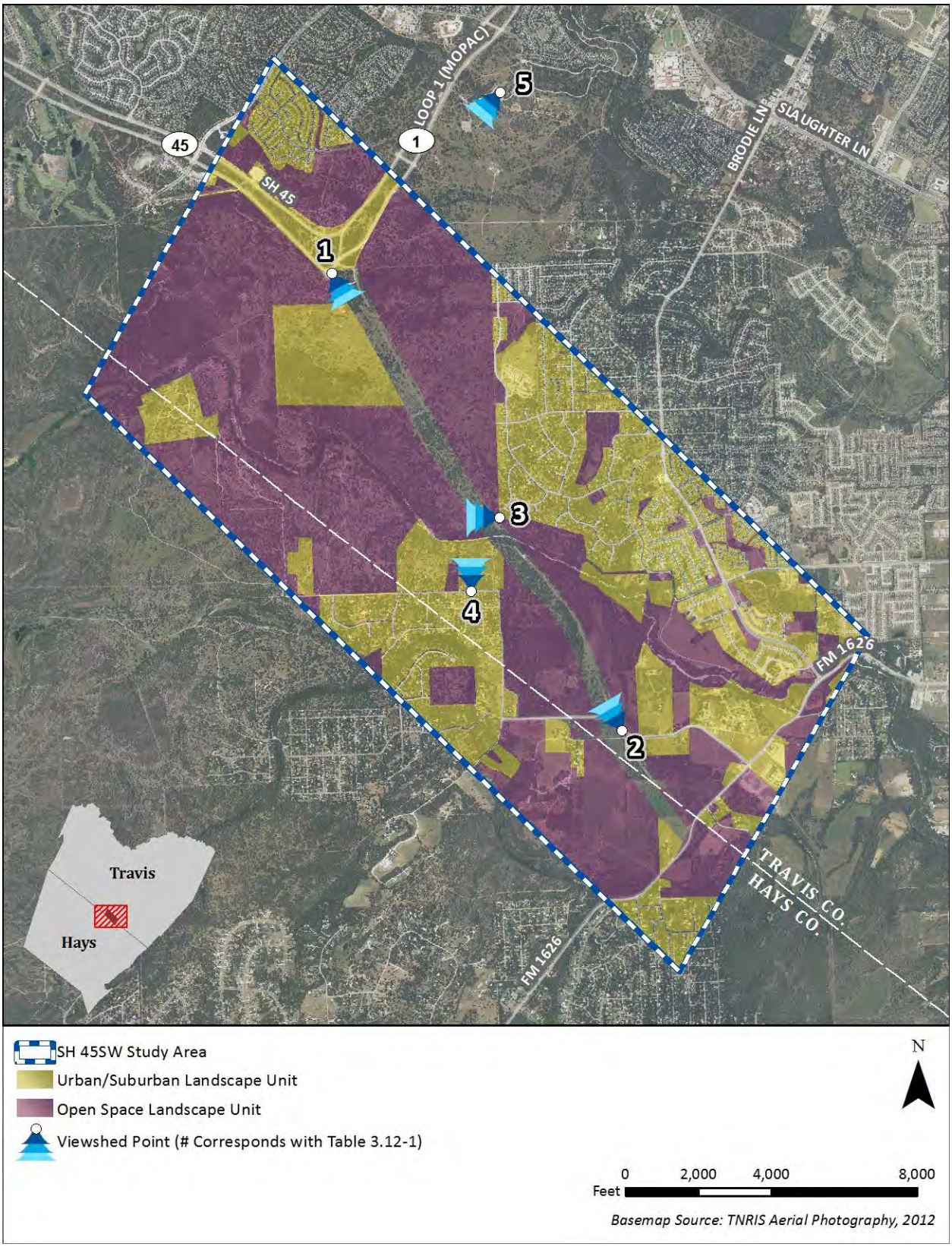
Figure 3.12-1: Visual Environment within the Study Area



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Proposed Project Viewshed

A viewshed is a subset of a landscape unit and is comprised of all the surface areas visible from an observer's viewpoint. It also includes the locations of viewers likely to be affected by visual changes brought about by project features and its limits are the visual limits of the views located to and from the proposed project. Potential viewsheds extend out into the surrounding area. The viewsheds for the proposed project include locations within the two landscape units where viewers are likely to be affected by visual changes brought about by the proposed project features. For the purposes of the analysis, the proposed project's viewsheds have been defined by the boundaries of the two landscape units.

Existing Visual Resources and Quality

The quality of the existing visual resources was evaluated by identifying the vividness, intactness, and unity present in the viewshed.

- **Vividness** is the visual power or memorability of landscape components as they combine in distinctive visual patterns.
- **Intactness** is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as in natural settings.
- **Unity** is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape (FHWA, 1988).

This approach is particularly useful in transportation planning because it does not presume that a highway project is necessarily an eyesore. This approach to evaluating visual quality can also help identify specific methods for mitigating specific impacts that may occur as a result of a project.

Open Space Landscape Unit

The visual quality of this landscape unit is "high" due to the natural state of the landscape. A majority of the study area is comprised of parkland, open space, and undeveloped property. Parks and protected lands account for over half the undeveloped land in the study area and are the most common land use in terms of acreage. COA's WQPLs comprise a portion of these protected lands and are protected from development in perpetuity to maintain the quality and productivity of the Edwards Aquifer. The protection of these areas has the added benefit of providing habitat for protected species and creating green space for recreational use. These lands account for over 1,800 acres, or 34 percent, of the total study area.

Urban/Suburban Landscape Unit

The visual quality of this landscape unit is “moderate.” The area is characterized by a mix of civic, religious, commercial, and educational development centered around residential land uses. In general, there is a sense of intactness and unity within the developed areas. Most of the larger residential developments are centered around the natural landscape. The northern section of the study area is the most urbanized, characterized by large lot and standard lot single family subdivisions, with some multifamily developments along Slaughter Lane and Manchaca Road. The southeastern portion of the study area contains large lot single family residential subdivisions, most within the city of Hays' and city of Austin’s ETJs.

3.12.2 Direct Effects

Build Alternative

Visual impacts of the proposed project are determined by assessing changes to the visual resource from the proposed project and viewer response to that change. A change in the visual resources would be analyzed based on the sum of the change in visual character and quality as a result of the proposed project. There are three steps in determining visual resource change:

1. Assess the compatibility of the proposed project with the visual character of the existing landscape as described in the existing environment description in **Section 3.12.1** of this FEIS;

2. Compare the visual quality of the existing visual resource with the visual quality of the resource after the proposed project is constructed;

3. Determine the viewer response to the proposed project, which is a combination of viewer exposure and viewer sensitivity to the proposed project (FHWA, 1988).

These three steps assess the degree of impact to the visual resource based on the severity of the change to the visual resource and the degree to which people would likely be opposed to that change.

Five key viewpoints were chosen for analysis in order to evaluate changes to the visual resource resulting from the proposed project. These five viewpoints are summarized in **Table 3.12-1** and their locations are shown in **Figure 3.12-1**.

Table 3.12-1: Key Viewpoints

Key View Number	Key View	Description
1	Looking southeast from the northern terminus of the proposed project at MoPac/SH45.	Representative view of the proposed project from an adjacent roadway in a mix of the Urban/Suburban and Open Space landscape units.
2	Looking northwest from the southern terminus of the proposed project at FM 1626.	Representative view of the proposed project from an adjacent roadway in a mix of the Urban/Suburban and Open Space landscape units.
3	Looking west from the Shady Hollow Estates subdivision to the east of the proposed project.	Representative view of the proposed project from an adjacent residential area located within in Urban/Suburban landscape unit immediately adjacent to the Open Space landscape unit.
4	Looking north from the Arrowhead Acres subdivision to the south of the proposed project.	Representative view of the proposed project from an adjacent residential area located within in Urban/Suburban landscape unit immediately adjacent to the Open Space landscape unit.
5	Looking southwest from the Lady Bird Johnson Wildflower Center.	Representative view of the proposed project from a stone tower on the site of the Wildflower Center property.

Source: CP&Y, 2014a

The visual impact for each key view was assessed and rated according to the level of impact anticipated from the proposed project (Low, Moderate, Moderately High, and High). The visual impact levels for each key view are defined as follows:

- **Low** – Minor adverse change to the existing visual resource, with low viewer response to change in the visual environment.
- **Moderate** – Moderate adverse change to the visual resource with moderate viewer response.
- **Moderately High** – Moderate adverse visual resource change with high viewer response or high adverse visual change with moderate viewer response.
- **High** – A high level of adverse change to the resource or a high level of viewer response to the visual change such that architectural design and landscape treatment cannot mitigate the impacts. Viewer response level is high

The visual assessment results are presented in **Table 3.12-2**.

Table 3.12-2: Visual Assessment

Key View Number	Visual Quality – Existing Conditions			Visual Quality – With Proposed Project			Viewers Response			Resulting Visual Impact		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
1	X			X			X			X		
2	X			X			X			X		
3		X			X			X			X	
4	X			X				X			X	
5		X			X			X			X	

Source: CP&Y, 2014b

Key View # 1

Key View # 1 is looking southeast form the northern terminus of the proposed project at MoPac/SH 45. Sight distance to both sides of the existing roadway is limited by dense vegetation, exhibiting a low visual quality. The proposed project would result in low changes to the south of the existing roadway with the construction of the proposed project, changing the visual quality and character of the landscape unit to the south from Open Space to a developed road within the state-owned ROW. Travelers using MoPac/SH 45 would briefly see the proposed project while traveling either north or south along that roadway and would have a moderate awareness of changes. The proposed project would result in a minor change to the visual environment. Viewer response to changes from the proposed project from this key view are anticipated to be low as there are no residences nearby and the change to visual quality of the area would be minimal. The overall visual impact to Key View # 1 from the proposed project is anticipated to be low.

Figure 3.12-2: Key View # 1

Key View # 2

Key View # 2 is looking northwest from the southern terminus of the proposed project at FM 1626. Sight distance to the north of the existing FM 1626 roadway is limited by dense vegetation. To the south of the existing roadway vegetation is only moderately dense, allowing for partially obstructed views of undeveloped fields and a few small buildings, making the overall visual quality of the area low. The proposed project is anticipated to be at grade at the FM 1626 interchange which would result in a minor change in visual quality as the view to the north of FM 1626 is vegetated with limited sight distances. The visual quality of the view to the south of FM 1626 would likely remain unchanged. Viewer response to this change is anticipated to be low as there are no residences nearby and viewers traveling FM 1626 would only be exposed to the changed view for a limited amount of time while driving. The overall visual impact to Key View # 2 from the proposed project is anticipated to be low.

Figure 3.12-3: Key View # 2

Key View # 3

Key View # 3 is the view from the westernmost edge of the Shady Hollow Estates subdivision to the east of the proposed project ROW. Site distance to the west of Shady Hollow Estates is partially limited by patchy vegetation, giving the view a moderate level of overall visual quality. The proposed project would span Bear Creek in a portion of the ROW that could be visible from the westernmost edge of Shady Hollow Estates. This would have a moderate impact on this key view as there are no other roadways visible in this view. Viewer response is likely to be moderate among residents who have their view of the Open Space landscape unit from their property altered by the proposed project. The overall visual impact to Key View # 3 form the proposed project is anticipated to be moderate.

Figure 3.12-4: Key View # 3

Key View # 4

Key View # 4 is looking north from the Arrowhead Acres subdivision to the south of the proposed project ROW. Vegetation looking north from the subdivision is dense, giving a limited sight distance and exhibiting an overall low visual quality. The proposed project would span Bear Creek in a portion of the project ROW that may be visible from the northern edge of Arrowhead Acres, resulting in a moderate impact to the visual quality of the key view as there are no other roads visible. Viewer response to the change is anticipated to be moderate among those residents who have the view from their property into the Open Space landscape unit altered by the proposed project. The overall visual impact to Key View # 4 from the proposed project is anticipated to be moderate.

Figure 3.12-5: Key View # 4

Key View #5

Key View # 5 is looking south/southwest from the stone tower, known as the San Antonio Tower, on the site of the Lady Bird Johnson Wildflower Center, toward the proposed project ROW. This key viewpoint lies outside the proposed project's study area, but was included in the visual impacts analysis as a result of public and agency comments requesting that potential impacts to the viewshed of the tower be assessed.

The visual quality looking south and west from the tower at the Wildflower Center is moderate and includes the grounds of the wildflower center, undeveloped tracts to the south, the existing LCRA transmission lines in the far distance to the south, and MoPac to the west and southwest. The proposed project may be visible to patrons of the Wildflower Center when standing on top of the tower. According to information obtained from the Wildflower Center, the tower rises approximately 48 feet above the existing ground, and is the highest viewpoint at this location. The visibility of the proposed project ROW is low due to the distance of the tower from the ROW, which is over one mile away from the tower. In addition, there is an existing

transmission line with poles that extend approximately 880 feet amsl, well above the tree line that is visible in the direction of the proposed project. There are also various other utility transmission poles scattered throughout the viewshed visible from the tower in the direction of the proposed project. At its highest elevation at SH 45 over MoPac, the proposed interchange would reach as high as 842.5 feet amsl, 37.5 feet lower than the highest point of the LCRA transmission lines. The SH 45/MoPac interchange would be visible from the tower, but would likely be obscured somewhat by the existing transmission lines and its distance. In the far distance, past the site of the proposed project, buildings within the subdivision near Archeleta Boulevard are also visible. The anticipated impact to the visual quality of this key view is considered moderate despite the existing intrusions into the viewshed because the tower is used for enjoying vistas of the surrounding area. Viewer response is anticipated to be moderate among those visitors to the Wildflower Center who choose to climb to the top of the tower.

Figure 3.12-6: Key View # 5

Lighting

Illumination of SH 45SW would be limited to safety lighting at intersections and underpasses. This includes locations of roadway intersections, including SH 45SW and FM 1626, Bliss Spillar and the SH 45SW ramps, the Bliss Spillar ramp gores connecting to SH 45SW, and SH 45SW at MoPac. Due to the rural setting of the project, illumination would not utilize high mast lighting, but conventional height illumination standards, approximately 40 feet in height, with flat cutoff lenses, or LED fixtures, to minimize the glare emitted by the fixture. It is anticipated that underpass lighting would be required for the SH 45SW bridges over Bliss Spillar and MoPac. Light reflected from the pavement would be minimized since an ashphaltic

pavement surface would be used instead of concrete (six percent vs. 25 percent). Lighting along the proposed shared use path may be installed in certain locations.

No Build Alternative

Under the No Build Alternative, there would be no impacts to the visual and aesthetic quality of the study area resulting from the proposed project.

3.12.3 Encroachment-Alteration Effects

No encroachment-alteration effects are anticipated to occur to visual or aesthetic resources under the Build Alternative.

3.13 Irreversible and Irretrievable Commitments of Resources

The implementation of the Build Alternative involves the commitment of natural, physical, human and fiscal resources. Land utilized in the construction of a roadway is considered an irreversible commitment during the period that the land is used as a transportation facility; however, if a greater need arises for the use of the land, or if the roadway facility is no longer needed, the land can be converted to another use. Presently, there are no reasons to consider that such a conversion would ever be necessary or desirable. Considerable amounts of labor, construction material, and fuel would be expended as a result of the construction of the proposed project. Additionally, substantial amounts of labor and natural resources would be required in the fabrication and the preparation of the construction materials. The natural resources required for construction include aggregate, cement, asphalt, sand, and iron ore for steel products. Once used for construction, these resources cannot be replaced as natural resources. Although these materials are generally irretrievable, they are not in short supply and their use would not have an adverse effect upon the continued availability of these resources. Any construction would also require a substantial expenditure of local and state funds, which are not retrievable. Construction would also require an expenditure of fossil fuel. The commitment of these resources is based on the concept that residents in the immediate area, region and state would benefit by the improved quality of the transportation system. These benefits would include, but not be limited to, improved accessibility and safety, savings of time, and a greater availability of quality services. These benefits are anticipated to outweigh the commitment of resources for the construction of the proposed project.

There would be irretrievable and irreversible commitments of land, material, and capital used in the construction of the Build Alternative/Preferred Alternative. The No Build Alternative would involve no SH 45SW project-related irreversible or irretrievable commitment of human and/or natural resources.

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4.0 INDIRECT AND CUMULATIVE IMPACTS

4.1 Summary of Indirect Impacts

A technical report describing the detailed analysis conducted to assess indirect effects associated with the proposed project is provided in **Appendix D: *Indirect Impacts Technical Report***. The analysis in the ***Indirect Impacts Technical Report*** was developed using TxDOT's September 2010 *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*, which is based on the 2002 National Cooperative Highway Research Program (NCHRP) Report entitled *NCHRP Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (NCHRP 2002). Other sources of guidance include the NCHRP Project 25-25, Task 22 report entitled *Forecasting Indirect Land Use Effects of Transportation Projects* (NCHRP 2007). This analysis was also developed using AASHTO's *Practitioner's Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA* (April 2011).

The Technical Report generally follows TxDOT's September 2010 *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*. It incorporates information from March 2014 updates to TxDOT's *Cumulative Impact Analysis* guidance which emphasizes a focus on the most sensitive resources. Together, these documents are hereafter referred to as "TxDOT ICI guidance." TxDOT's 2010 guidance utilized a seven-step process as its framework, but this FEIS analysis presents a fusion of the seven steps along with four key steps for indirect impact analysis in the 2011 AASHTO Practitioners Handbook. The AASHTO publication highlighted the four key tasks:

- Scoping
- Resources Analyzed for Indirect Impacts
- Goals and Trends
- Impact-Causing Activities
- Potentially Substantial Indirect Impacts
    - Access Alteration
    - Effects Resulting from Induced Growth
    - Minimization and Mitigation

Key steps in the analysis process and major findings from this report are summarized below. For this analysis, it is important to define the terms "substantial" and "significant." According to TxDOT's ICI guidance (2010), "[t]he common definition of 'substantial' is 'of ample or considerable amount, quantity, size, etc.' Substantial impacts are those that are noteworthy." TxDOT rules define the term "significant" as it has been interpreted under NEPA and its related regulations. See 43 TAC 2.5 (26). That interpretation includes the definition used in 40 CFR 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze

the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.

It should be noted that the term "indirect effects" is used in some guidance documents (AASHTO 2011) while "indirect impacts" is used in other documents (TxDOT 2014); both terms are used in the current analysis and their meanings are the same. *NCHRP Report 466* (2002) identifies three broad categories of indirect effects:

1. **Encroachment-alteration effects**: These effects may result from changes in ecosystems, natural processes, or socioeconomic conditions that are caused by the proposed action but occur later in time or farther removed in distance. One example of this type of effect would be a change in habitat or flow regime downstream resulting from installation of a new culvert.

2. **Project-influenced development effects**: Sometimes called induced growth or the "land use effect." For transportation projects, induced growth effects are most often related to changes in accessibility to an area, which in turn affects the area's attractiveness for development. Indirect impacts associated with induced development are also similar to direct impacts but would occur in association with future land use development undertaken by others over the development horizon within a larger study area beyond the direct footprint of the proposed project.

3. **Effects related to project-influenced development**: These are impacts to the natural or human environment that may result from project-influenced changes in land use.

For the analysis in the ***Indirect Impacts Technical Report,*** encroachment-alteration effects were discussed in the FEIS document following each resource's direct effects discussion, per current TxDOT direction. Encroachment-alteration impacts are summarized in **Table 4-2** in the ***Indirect Impacts Technical Report***. Project-influenced development effects are discussed in the access alteration section under potentially substantial indirect impacts (**Section 7.2**). Effects related to project-influenced development are discussed within the section on effects resulting from induced growth (**Section 7.3**). Planning judgment, collaborative judgment, and cartographic techniques were employed in this analysis.

A screening tool was utilized to identify resources that could potentially be substantially affected by indirect impacts, including induced land development within the AOI. The screening tool discusses whether or not the resource is included in the detailed discussion of potentially

substantial indirect effects. The following resources are analyzed in detail for potentially substantial indirect impacts: threatened and endangered species and water resources – including the Edwards Aquifer/groundwater (including related karst geology) and surface water. All evaluated resources are analyzed with respect to encroachment-alteration effects in the main body of the FEIS document, following each resource's direct effects discussion.

The Area of Influence (AOI) represents the geographical area within which potential indirect effects related to the proposed project, such as project-influenced development, would be most likely to occur. The AOI was delineated based on the following factors: a determination of those areas most likely to be potentially opened for development following construction of the roadway, discussions with local planning experts in the municipalities and counties within the AOI, and a determination of natural resources that could be potentially indirectly impacted. The AOI includes some or all of the cities of Austin, Buda, Hays, San Leanna, and unincorporated parts of Travis and Hays counties. The boundaries of the AOI are Slaughter Road to the north, RM 1826 to the west, RM 967 to the south, and IH 35 to the east – an area totaling approximately 41,674 acres.

The goals of the various communities in the AOI (the study area for indirect impact analysis) are discussed, including community planning goals, demographic and development trends, factors influencing growth, and areas of environmental or social sensitivity. Data for population and housing development are discussed to identify trends. For example, the Austin area has experienced significant and sustained growth over the last four decades, with the populations of Hays and Travis counties increasing by 468 percent and 247 percent, respectively, over the period 1970 to 2010 (Texas Almanac, 1980; US Census, 1990, 2010). During the period between 2000 and 2009, the largest portion of development occurred within the overall AOI. In Austin, the largest portion of construction within the time period from 1970 to 2009 occurred from 1980 to 1989. Development in Hays and Travis counties substantially occurred between 2000 and 2009.

Impact-causing activities are also identified. The primary impact-causing activities would be modification through removal of vegetation and wildlife habitat, and access alteration through development of a new controlled access roadway facility with limited access to the existing roadway network.

The detailed technical analysis of access alteration effects and effects resulting from induced growth are also presented in the ***Indirect Impacts Technical Report***. The techniques utilized for this analysis are primarily Planning Judgment, determined through holding meetings, administering questionnaires and conducting phone interviews with planning professionals in the proposed project vicinity, and Collaborative Judgment to the extent that numerous professionals were contacted as part of this analysis. Often several people from a particular entity contributed to questionnaire responses. The Cartographic Technique involved data collected remotely and in the field, combined with analysis of various constraints layers and the

proposed alignment utilizing GIS technology. These techniques are described in TxDOT's 2010 guidance, referencing NCHRP Report 466.

Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis counties, and the responses of local planning experts, the proposed project is not anticipated to generate significant induced development. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would constrain the amount of induced growth possible in the AOI. The degree to which that development is specifically attributable to construction of the proposed project is limited for several reasons: there is a high growth rate in the area in general, there is limited development potential nearby due to undevelopable lands, the area is also surrounded by developments that are already underway, and the roadway may serve regional traffic to a greater degree than it serves local traffic or spurs local development.

A questionnaire regarding the potential of the project to induce development in the AOI was disseminated to various local planning experts in the area, including the COA, Travis and Hays counties, CAMPO, City of Buda, and other municipal jurisdictions. Based on the responses to this questionnaire, several respondents indicated that much of the planned development in the area will occur regardless of whether or not the proposed project is constructed. Further, the Build Alternative is proposed as a limited access roadway with only three points of access. No frontage roads would be constructed along the route, which is bordered for most of its length by WQPLs protected from development. The connection between the construction of this roadway and development is most apparent for developable land at the access points – FM 1626, Bliss Spillar Road, and MoPac. In addition, other roadways at the boundaries of the AOI, such as RM 1826, RM 967, and FM 1626, are more likely to influence adjacent development than SH 45SW. For these reasons, the proposed project's effects on induced growth are expected to be minimal.

Approximately 9,387 acres ("developable land") of undeveloped land within the 41,674-acre AOI could be subject to development in the foreseeable future (through 2035). Land that is already planned or platted for development was not included in this total as it is assumed that land will be developed. The developable land was identified through planner questionnaires and cartographic analysis, and its development is considered possible but not necessarily probable (as opposed to land that is already planned or platted which is considered probable and reasonably foreseeable, regardless of the proposed project). The developable land is not necessarily causally connected to the proposed roadway project. Potential development at intersections with existing roadways is the most likely to occur in conjunction with the proposed project. Nonetheless, cartographic techniques were used to assess the sensitive resources that could be found within that developable land area. The analysis discusses the minimization and mitigation tools that would apply to development proposed by others in those areas.

Development projects that occur within the planning horizons of the municipalities contacted would have to comply with those cities' land development codes within the city limits and ETJs where applicable. Areas outside municipal limits would be subject to state and federal laws.

Induced growth that may occur could have some effect on water resources because induced development would result in increased impervious cover, which could in turn have an effect on water quality. However, surface water and groundwater in the AOI would not be adversely affected in a substantial way because of the high percentage of managed areas and the implementation of regulations and BMPs. Through the utilization of proposed BMPs, at least 90 percent of the incremental increase in post-construction TSS attributed to the project would be removed over the Recharge Zone; additionally, land developments proposed by others would be subject to water quality protection regulations as applicable.

Existing regulatory processes would provide controls to minimize potential adverse water quality-related impacts to threatened or endangered species. Impacts to individuals or habitat of federally listed species are subject to federal regulations under the ESA. The COA and Travis County's BCCP, in addition to the Hays County RHCP, are potential permitting mechanisms available to developers to facilitate compliance with the ESA in the AOI. In addition, the Save Our Springs ordinance limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites by others in the Barton Springs Zone.

With regard to potential effects on water quality, regulations are in place to minimize impacts to the resource. These include TCEQ regulations requiring preparation of SW3Ps and use of BMPs or WPAPs as required over the Edwards Aquifer, in addition to city and county drainage/water quality requirements applicable to local projects. Section 404 provisions of the CWA grants the USACE jurisdiction over activities that would affect waters of the U.S. and wetlands, regardless of who proposes the development activity. Individual developers would be responsible for complying with these regulations.

The indirect effects that are described in the ***Indirect Impacts Technical Report*** do not conflict with the various goals of planning and conservation entities in the AOI; are not expected to substantially worsen the condition of a sensitive resource; would not delay or interfere with habitat conservation planning efforts or species recovery efforts for sensitive species; would not eliminate a valued, unique, or vulnerable feature; and are not inconsistent with applicable laws. Therefore, additional mitigation is not proposed for the anticipated indirect effects potentially caused by construction of SH 45SW.

4.2 Summary of Cumulative Impacts

A technical report describing the detailed analysis conducted to assess cumulative effects associated with the proposed project is provided in **Appendix I: *Cumulative Impacts***

***Technical Report*,** in accordance with NEPA, TxDOT, and AASHTO policies and guidance. Key steps in the analysis and major findings from this report are summarized below.

Scoping for the proposed project, including cumulative effects, was conducted via the following methods: regular coordination among the study team and the proposed project's sponsors and stakeholders, public and agency involvement through public scoping and information meetings, and distribution of a questionnaire to local planning entities via e-mail and phone interviews. The scoping process, in addition to the direct and indirect impacts analyses, led to the identification of key resources for detailed cumulative effects analysis. The following resources are analyzed in detail in **Appendix I: *Cumulative Impacts Technical Report*** for potentially substantial cumulative effects: threatened and endangered species and water resources (Edwards Aquifer/groundwater and surface water). For each resource analyzed for cumulative effects, Resource Study Areas (RSAs), goals, trends, and current conditions were established.

The ***Cumulative Impacts Technical Report*** identifies Golden-cheeked Warblers, Austin blind salamanders, and Barton Springs salamanders and their habitats as sensitive resources; discusses the health of these resources and relevant trends; and identifies specific RSA boundaries and appropriate temporal boundaries for the analysis. Direct and potential indirect impacts are summarized for each sensitive resource. Past, present, and reasonably foreseeable future actions are identified through research, interviews, and cartographic analysis. The proposed construction of SH 45SW is considered in conjunction with these other actions to assess aggregate impacts. In addition to researching various published documents and plans, a simple questionnaire explaining the proposed project and requesting information about other actions was distributed to several entities including the cities of Dripping Springs, Kyle, Buda, and Hays and Travis Counties. Additional research was conducted to identify transportation plans and future land use plans in smaller communities such as Bee Cave. A map is included in **Appendix I: *Cumulative Impacts Technical Report*** depicting a combination of all RSAs to capture the "combined RSA" in order to identify other actions within that study area. A combination of Planner Interviews, Cartographic Techniques, and technical expert research and data collection was used in order to assess the overall effects of the proposed project combined with other actions within each RSA. Logical analysis is utilized to appropriately describe sensitive resources that are within the RSAs for SH 45SW, and the extensive controls that have evolved over time to help protect these resources are also discussed.

The proposed project would add a total of approximately 51.6 acres of impervious cover, of which 48.1 acres (93.2 percent) would be added within the Recharge Zone of the Edwards Aquifer. Research has shown a strong correlation between the imperviousness of a watershed and the health of its receiving streams. Past activities have resulted in the development and changing land uses in the watersheds within the RSA. The extent of past growth is evident through an assessment of impervious cover in all watersheds in the groundwater RSA in the years 1970 (1.9 percent), 1990 (4.6 percent), and 2012 (8.1 percent).

As the trend for growth in the Austin area continues, the trend for increased impervious cover in the watersheds in the RSA would be expected to continue. The various land use plans identified indicate that the municipalities within the RSA anticipate future development, along with preservation of open space. As discussed in the ***Indirect Impacts Technical Report***, proposed developments would be subject to various municipal land development codes that require environmental investigations or impose development restrictions, such as impervious cover limits, in addition to county, state, and federal regulations that may apply. Generally speaking, the correlation between increased impervious cover and decreased surface water quality is strong. However, with current regulatory measures and future planning efforts to protect water quality, future development would be less likely to adversely affect surface and groundwater quality. With implementation of the various BMPs, and requirements set by numerous authorities that govern within the RSA, it is likely that the proposed project (with its robust water quality control commitments) would minimally contribute to cumulative impacts to water quality or quantity.

Minimization of impacts to sensitive resources would be achieved through specific design measures and BMPs implemented for the proposed project, and similar requirements would be applicable to developers throughout a large percentage of the RSAs, especially where construction is proposed over the Recharge and Contributing Zones of the Edwards Aquifer. Mitigation measures are evaluated for impacts to endangered species habitat, and Habitat Conservation Plans are in place in Travis County and Hays County that provide a framework in which developers can comply with the ESA. Most municipalities within the RSA have land development code requirements and plans for their future land use and transportation networks, along with open space and park planning that generally reflect a common commitment to sustainable development. The conservation entities charged with protecting endangered species and sensitive resources have plans in place to continue to protect sensitive habitats. A large portion of land within the RSAs studied would be protected in perpetuity through conservation easements or WQPLs, specifically acquired for that purpose. These regulations and plans would apply to developments proposed by others occurring within the AOI and RSAs where applicable, providing regulatory means by which substantial environmental impacts caused by development would be minimized.

Based on the analysis in the ***Cumulative Impacts Technical Report***, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Golden-cheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable projects. This determination is supported by several factors, including: limited direct impacts that would be caused by the proposed limited access project with extensive BMPs before, during, and after construction; the incremental contribution the proposed roadway would make toward induced

development in the AOI; and the continuing trends of land use development and conservation initiatives underway within the RSAs.

5.0 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

Rationale for Recommending the Preferred Alternative

The Build and No Build Alternatives were evaluated throughout this FEIS in terms of their effects on the natural and human environments, as well as their ability to meet the proposed project's purpose and need. The following criteria were utilized to evaluate the alternatives:

- Ability to meet the proposed project's purpose and need;
- Effects on the human and natural environments, including:
    - Impacts to WQPLs;
    - Impacts to neighborhoods;
    - Impacts to threatened and endangered species and their habitat; and
    - Projected impacts on mobility.

The Build Alternative was identified as the Preferred Alternative for implementation for the following reasons.

The Build Alternative:

- Satisfies the proposed project's purpose and need, as described in **Sections 1.4 and 2.2.5**;
- Addresses input of citizens and other stakeholders by:
    - Incorporating water quality protection measures that exceed the requirements of the Edwards Aquifer Rules;
    - Reconfiguring the MoPac-SH 45SW interchange to increase safety;
    - Incorporating design elements from the Mobility Authority-sponsored design competition, the Green Mobility Challenge, including PFC pavement, bio-filtration, and innovative interchange design;
    - Adding a shared use path along the proposed project's length to accommodate bicycles and pedestrians;
    - Including a new location for shared use path connection to the proposed Violet Crown Trail resulting from coordination with the City of Austin and Hill Country Conservancy;
    - Excluding frontage roads throughout the proposed project's length;
    - Minimizing direct impacts to karst features by eliminating the center grassy median between MoPac and Bear Creek to provide a narrower construction footprint and aid in establishing a horizontal roadway alignment that best avoids known karst features; and
    - Modifying the alignment evaluated in the DEIS to avoid permanent filling or other direct impacts to the openings of 17 sensitive karst features to the extent

practical and to minimize impacts to the Flint Ridge Cave catchment basin from 5.6 acres to approximately 0.7 acre, which would be compensated for by modifications to provide an equivalent area of catchment; and

- Avoids impacts to WQPLs, neighborhoods, and public facilities by constructing all improvements within the existing state-owned ROW.

6.0 MITIGATION AND PERMITTING

The following sections identify mitigation and permitting that would likely be required for the implementation of the Build Alternative.

6.1 Construction Management

Construction activities would temporarily affect vehicular traffic along SH 45, MoPac, Bliss Spillar Road, and FM 1626. As part of the construction contract requirements, the contractor would be required to maintain the necessary number of barricades, signs, flags, and traffic barriers to direct vehicular traffic away from construction areas. A detailed traffic control plan would be developed to minimize traffic disruption. Access to adjacent properties would remain open through all phases of construction. During construction of the proposed project and its connections to SH 45, MoPac, Bliss Spillar Road, and FM 1626, existing traffic lanes would remain open at all times with the exception of short-term off-peak periods as necessary to provide for the safe implementation of traffic control devices or short-term construction activities. Expedited bridge building techniques such as prefabrication and night-time working hours can be used if necessary to minimize impacts on traffic near the MoPac/SH 45 intersection. At this time, no detours are anticipated to be required during the construction of the proposed project. However, if a detour is determined to be necessary, approval from TxDOT would be obtained prior to implementing traffic control measures.

Erosion and sediment control during construction would be supervised by an independent environmental compliance manager, assuring the contractor follows the approved SW3P. The SW3P would be prepared in detail per phase of construction so that streams and recharge features are protected in the earliest phase possible.

6.2 Community Resources

For all motorists who use the proposed roadway, the same toll would be assessed regardless of income. The existing local roadway network would continue to be available for use without a toll. Transit vehicles, registered vanpools, and emergency vehicles would have access to the proposed roadway free of charge.

6.3 Air Quality

During the construction phase of this proposed project, temporary increases in air pollutant emissions may occur from construction activities. The primary construction-related emissions are particulate matter (fugitive dust) from site preparation. These emissions are temporary in nature (only occurring during actual construction); it is not possible to reasonably estimate impacts from these emissions due to limitations of the existing models. However, the potential impacts of particulate matter emissions will be minimized by using fugitive dust control

measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.

The construction activity phase of this project may also generate a temporary increase in MSAT emissions from construction activities, equipment, and related vehicles. The primary MSAT construction-related emissions are diesel particulate matter from diesel-powered construction equipment and vehicles. The Texas Emissions Reduction Plan (TERP) includes incentive programs to encourage the development of multi-pollutant approaches to ensure that the air in Texas is both safe to breathe and meets the minimum federal standards. TxDOT encourages construction contractors to utilize this program to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http: //www.tceq.state.tx.us/implementation/air/terp/.

However, considering the temporary and transient nature of construction-related emissions, as well as the mitigation actions to be utilized, it is not anticipated that emissions from construction of this project would have any significant impact on air quality in the area.

6.4 Traffic Noise Analysis

Because the predicted noise levels approach, equal, or exceed the NAC, or have a substantial increase, noise abatement measures were considered for this proposed project. Six receivers, R6, R7, R8, R9, R10, and R11, were impacted due to a substantial increase in sound levels. These receivers represent individual residences located near the proposed SH 45SW corridor. Noise barriers that would achieve the minimum feasible reduction of five dBA at greater than 50 percent of first row receivers and reduce the noise level at one or more receivers by at least seven dBA would exceed the reasonable, cost-effectiveness criterion of $25,000. One receiver, R15, was impacted based on NAC B criteria. This receiver represents two residences with driveways facing FM 1626. A continuous noise barrier would restrict access to these residences. Gaps in a noise barrier would satisfy access requirements but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of five dBA or the noise reduction goal of seven dBA or greater noise reduction of at least one receiver.

The Greyrock Ridge subdivision is a platted residential development with 387 planned lots and is located adjacent to the west side of the SH 45SW ROW. Many of these lots would back up to the proposed SH 45SW facility. However, after consultation with the developer representative it was determined that a building permit has been issued for only one section of the subdivision. The permitted lot located closest to the SH 45SW alignment was modeled for traffic noise impacts and no impacts were predicted. Therefore, no noise abatement measures are proposed for the proposed project.

Although the use of different pavement types are not an approved noise mitigation measure, the use of PFC pavement on this project is likely to result in lower noise levels than

those projected by the model results. Also, provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures, such as work-hour controls and proper maintenance of muffler systems.

6.5 Water Resources

6.5.1 Water Quality

The proposed project would adhere to the following permitting requirements, which were enacted to protect water quality.

Water quality would be addressed, along with other issues, through the development of an ECMP. The plan would include provision for specialized personnel with knowledge of relevant environmental issues, environmental compliance training for other personnel, and management practices to address water quality. Practices would include project inspection for permit compliance, geologic inspection of trenching activities, surface water quality monitoring, hazardous materials handling protocols, and other good housekeeping measures. The plan would be overseen by an independent environmental compliance manager.

The proposed project would disturb more than five acres of land and therefore, would require compliance with the TPDES. Compliance would entail applying for coverage under the Construction General Permit (CGP). As part of the CGP application, a SW3P would be prepared and a Notice of Intent (NOI) would be filed before construction begins.

Portions of the proposed project would occur in the Edwards Aquifer Recharge Zone. It would therefore require compliance with the Edwards Aquifer Protection Program through the development of an Edwards Aquifer protection plan. Requirements include a Geologic Assessment of the proposed project area and the development of a WPAP. Furthermore, karst features would be protected through the establishment of buffer zones and buffer zone management plans as appropriate per guidance provided by TCEQ (2005) where practical. Discovery of voids during construction would trigger void discovery protocols. These protocols would include an assessment of the void by a qualified geologist and coordination with TCEQ if required. Protocols would be established in the ECMP. The TCEQ Edwards Aquifer Rules also require operation-phase maintenance of permanent BMPs as discussed in **Section 6.5.3**.

The proposed project includes a drainage system that would discharge to Municipal Separate Storm Sewer Systems (MS4) and would be required to meet minimum control measures (MCM) set by the TCEQ. The project would discharge to the COA and/or Travis County MS4s.

Based on design information, it is anticipated that SH 45SW would span four USACE-jurisdictional features within the ROW. Post-construction water protection would be provided

through the use of structural and non-structural BMPs. These would include water quality ponds/hazardous materials traps, which would provide post-construction water quality protection. These structural BMPs would be installed as soon as practicable during the construction phase in order to allow for the detention and treatment of construction site stormwater. This approach would be combined with other aspects of a general design philosophy which is guided by the protection of water quality. These aspects include phasing construction, protecting/preserving natural vegetation, and preventing off-site stormwater from flowing across active project areas.

Measures would be taken to prevent and correct erosion that may develop during construction. Temporary erosion controls would be in compliance with TxDOT Standard Specifications and would be in place, according to the construction plans, prior to commencement of construction. They would be inspected in accordance with the SW3P to ensure maximum effectiveness. Environmental training would be required for all project staff, including erosion and sediment control modules in compliance with TxDOT Special Provision 1122.

Water Pollution Control Measures

The following subsections discuss temporary and permanent water pollution control measures. More detail on each aspect of compliance plans is available in the ***Water Quality and Aquatic Resource Protection Technical Report*** (**Appendix H**). The controls would include the following:

- Construction boundaries, including karst feature buffers, would be clearly marked;
- Appropriate erosion prevention BMPs would be applied in a timely manner as site conditions dictate to minimize the amount of time that disturbed soil is exposed;
- Trenching and other subsurface disturbance would be avoided whenever possible to minimize the likelihood of encountering a karst void;
- Up-gradient overland flow prevention;
- Slope stabilization;
- On-site sediment retention;
- Spill and hazardous materials management, and hazardous materials traps;
- Good housekeeping BMPs during construction;
- PFC pavement utilization;
- Vegetative buffers;
- Native/Xerophytic vegetation utilization;
- Pesticide prevention;
- Measures to protect Flint Ridge Cave (as illustrated in **Section 3.7** and **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***) would be constructed;

- Drill shaft construction would be restricted (as discussed in **Section 3.6**); and
- Street sweeping.

The type and location of appropriate permanent water pollution control measures would be determined during the final design of the proposed project.

6.5.2 Jurisdictional Waters of the U.S. (Section 404 Permitting)

Under Section 404 of the CWA, a permit is required from the USACE for any activity involving the discharge of dredged or fill material into waters of the U.S., including wetlands. Potential waters of the U.S. present in the proposed project area, based on field investigations, include Danz Creek, Danz Creek Split, Bear Creek, and Little Bear Creek. No wetlands were identified during field surveys. Based on proposed roadway design, the proposed SH 45SW would span jurisdictional features and, therefore, the proposed construction over waters of the U.S. would not require a Section 404 permit.

6.5.3 Groundwater

TCEQ's Edwards Aquifer Rules (Chapter 213) require the construction and maintenance of permanent water quality controls to remove TSS from runoff over the Recharge Zone after construction for the life of the roadway. These water quality control BMPs would include PFC pavement, water quality ponds, VFS, and grassy swales. Construction associated with the proposed project would use suitable BMPs for filtering stormwater, thereby reducing the potential for groundwater quality degradation from pollutants. The Edwards Aquifer Rules require the use of temporary and permanent BMPs for treatment of stormwater runoff from areas of impervious cover over the Recharge Zone. Post-construction BMPs would remove at least 90 percent of the incremental increase in TSS load generated by the increase in impervious cover over the Recharge Zone. Stormwater runoff would also be treated by BMPs over the Transition Zone, although treatment over the Transition Zone is not required by TCEQ. TCEQ enforces the Edwards Aquifer Rules by requiring the submittal and approval of a WPAP before initiation of any construction-related activity within the Recharge Zone for the aquifer. The contents of the WPAP would include information on the proposed project design, an assessment of the area geology, and plans for protecting sensitive features and water quality. In addition, water quality would be addressed through construction practices, including phased construction, limiting the area of disturbance, installing the applicable permanent BMPs in the early stages of construction, prevention of natural drainage from outside the state-owned ROW from mixing with construction runoff prior to treatment, separating and treating construction runoff, and construction oversight by an independent, on-site environmental compliance manager.

The proposed roadway alignment and profile have been designed to avoid permanent filling or other direct impacts to the openings or surface expressions of the seventeen sensitive

karst features in the state-owned ROW to the extent practical. Approximately 90 percent of the proposed SH 45SW roadway between FM 1626 and MoPac would be built on fill to control direction of surface water runoff. Approximately 20 percent of these fill areas would be elevated and separated from grade level by retaining walls in the vicinity of sensitive karst features. Also to reduce possible impacts to sensitive karst areas, total roadway width is proposed to be minimized north of Bear Creek. This segment of roadway would be constructed without a median, with westbound and eastbound travel lanes separated by concrete barriers for safety purposes. Drainage slots and/or inlets would be placed along the median barrier and inlets would be placed along the lower edge of the roadway barrier to capture roadway runoff and convey it to a water quality pond for treatment.

The proposed project would impact the surface drainage basins of two sensitive features in the state-owned ROW (F-55 and F-23 [Hat Sink]) and Flint Ridge Cave. At feature F-55, a bottomless culvert is proposed to span the feature and allow for drainage to continue, thereby maintaining recharge potential of this feature. Approximately 13.8 percent (approximately 2.24 acres out of approximately 16.26 acres) of the surface drainage basin to F-55 would be removed by the proposed project; vegetated diversion dikes would be utilized to divert water toward the feature and maintain recharge potential at this feature. At feature F-23 (Hat Sink), no impacts to the surface expression of this feature are anticipated. Approximately 10.9 percent (approximately 0.13 acre out of approximately 1.19 acres) of the surface drainage basin to Hat Sink would be removed by the proposed project; a vegetated diversion dike would be utilized to divert water toward the feature and maintain recharge potential at this feature. At Flint Ridge Cave, no impacts to the surface expression of this feature are anticipated. Approximately 1.3 percent (approximately 0.7 acre out of approximately 55.5 acres) of the surface drainage basin to Flint Ridge Cave would be removed by the proposed project. Drainage to Flint Ridge Cave would be maintained by re-routing an equivalent acreage of natural runoff into the cave's surface drainage area.

6.6 Ecological Resources

6.6.1 Vegetation and Wildlife Habitat

Of the approximately 312 acres of vegetation within the proposed project ROW, 161 acres would be impacted either permanently or temporarily through the clearing of trees and brush, need for construction equipment staging areas, and laying of new pavement. According to the EMST, the majority of the habitat impacted within the ROW is Deciduous Oak/Evergreen Motte and Woodlands of the Edwards Plateau. Approximately 1.9 acres of riparian and floodplain vegetation would be impacted by the proposed project.

Upon completion of construction activities associated with the proposed project, temporarily disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines. TxDOT would revegetate disturbed areas using a native seed mix.

Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable. Prior to any construction activities, particular attention would be paid to the potential for birds and bats to be nesting/breeding in culverts and under bridges. If vegetation clearing had to be performed during the bird breeding season, a survey would first be performed to ensure that active bird nests were not present in the area to be cleared.

Appropriate measures including the following would be taken to avoid adverse impacts on migratory birds. Between October 1 and February 15, the contractor would remove all inactive migratory bird nests from any structures that would be affected by the proposed project, and complete any necessary vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1, per the plan sheets. In the event that migratory birds are encountered on-site during project construction, adverse impacts to protected birds, active nests, eggs, and/or young would be avoided.

TxDOT would conduct surveys for red imported fire ants and tawny crazy ants in sites proposed to be used as sources for roadway fill material. Survey results and selection of fill sites would be approved by the TxDOT Austin District Biologist prior to material extraction.

6.6.2 Threatened and Endangered Species

Golden-cheeked Warbler and Black-capped Vireo habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. No Golden-cheeked Warblers or Black-capped Vireos were detected during the survey and no habitat known to be used regularly by either species is present in the state-owned ROW (**Appendix M: Biological Evaluation and Technical Reports**). TxDOT would clear the state-owned ROW and initiate construction activities outside of the Golden-cheeked Warbler nesting season. No impacts to these species are anticipated as a result of the proposed project.

Austin blind and Barton Springs salamanders are not expected to be present at the surface of the state-owned ROW; therefore, no direct impacts to these species from the proposed project are anticipated. Drill shafts would be excavated up to a depth of 25 to 35 feet in some locations as part of the proposed project. Measures to avoid impacts to groundwater quality and aquatic salamander habitat during drilling would include: 1) all equipment refueling and overnight storage would take place outside the 100-year floodplain; 2) drill shafts would have a steel casing; 3) drill shaft tailings would be removed from the 100-year floodplain daily to avoid backfilling the shaft; and 4) any voids encountered would be evaluated based on established criteria outlined in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***. Impacts to these species from changes in groundwater quality and quantity would be negligible based on the analyses discussed in **Section 3.6** and **Appendix D: *Indirect Impacts Technical Report***. The proposed BMPs are projected to have at least 90 percent efficiency in removing the incremental increase in TSS load generated by the increase in

impervious cover over the Recharge Zone and are in fact predicted to improve the existing quality of recharge entering the aquifer. This would minimize the chances of indirectly impacting federally listed salamander species. These BMPs are discussed in greater detail in **Appendix H: *Water Quality and Aquatic Resource Protection Technical Report***. A discussion of potential encroachment-alteration effects is provided in **Section 3.8.4** of this document.

No terrestrial state-listed species are known to occur in the proposed project area. It is possible, though unlikely, that the Texas horned lizard occurs in the project area. No permanent loss of known occupied habitat for any state-listed species is expected as a result of the proposed project.

The proposed project has the potential to cause minor impacts to several state SGCNs, although the only SGCN known definitively to occur in the project area are Bandit Cave spider and cave myotis. No karst features known or presumed to support Bandit Cave spider would be disturbed by project construction. The proposed project would cause a localized decrease in foraging habitat available to cave myotis but would also result in creation of a bridge that could be used by the species for shelter.. However, no permitting or mitigation is necessary for these species as there are no regulatory protections in place for these species.

Disturbances to unlisted or otherwise unprotected wildlife species would not necessitate mitigation above and beyond that currently proposed. In general, temporary disturbance of normal behavior patterns of some local wildlife species would be caused by the noise and physical activities of work crews.

All vegetation in the ROW that cannot be preserved in place would be removed between September 1 and March 1 in order for vegetation removal activities to occur outside the primary bird nesting season. In addition, the contractor would be prepared to prevent migratory birds from building nests on structures between February 1 and August 31. All methods to be used to preclude nesting would be approved by the TxDOT Austin District Biologist well in advance of planned use.

In the event that active nests of birds protected by the MBTA are encountered on-site during project construction, every effort would be made to avoid protected birds, active nests, eggs, and/or young. Consequently, the proposed project is not expected to result in the performance of any actions that would violate the MBTA.

6.7 Archeological Resources

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties or State Antiquities Landmarks in the Area of Potential Effect. No archeological resources that could provide new or important data concerning prehistory or history would be impacted by the Build Alternative. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease and

TxDOT archeological staff would be contacted to initiate post-review discovery procedures under the provisions of the First Amended Programmatic Agreement among FHWA, TxDOT, the Texas SHPO, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the MOU (43 TAC 2.24) between the THC and TxDOT.

6.8 Hazardous Materials

If hazardous constituents are unexpectedly encountered in the soil and/or shallow groundwater during construction operations, appropriate measures for the proper assessment, remediation and management of the contamination would be initiated in accordance with applicable federal, state, and local regulations. Appropriate soils and/or groundwater management plans for activities within these areas would be developed. Special provisions or contingency language would be included in the proposed project's plans, specifications, and estimates (PS&E) to handle hazardous materials and/or petroleum contamination according to applicable state, federal, and local regulations per TxDOT Standard Specifications. Hazardous items that require special handling would be removed only by certified and licensed abatement contractors having documentation of prior acceptable work.

In the event of an accidental spill of hazardous materials, TxDOT would work with other agencies and its contractors to secure the scene and implement appropriate spill response measures. Standard spill response procedures are outlined in 30 TAC 327 and the following guidance documents: *Occupational Safety Manual* – Chapter 4 "Hazardous Materials" (revised 2014), *Maintenance Management Manual* – Chapter 7, Section 4 "Oil and Hazardous Material Spills" (revised 2014); *Maintenance Operations Manual* – Chapter 5 "Emergency Spill Response" (revised 2010); and *Guidance for Environmental Compliance at TxDOT Facilities* "Small Spill Response" and "Abandoned Hazardous Materials" (revised 2004).

The contractor would take appropriate measures to prevent, minimize, and control the spill of fuels, lubricants, and hazardous materials in the construction staging areas. All spills, including those of less than 25 gallons shall be cleaned immediately and any contaminated soil shall be immediately removed from the site and be disposed of properly. Designated areas shall be identified for spoils disposal and materials storage. The areas shall be protected from inflow and runoff. All materials being removed and/or disposed of by the contractor would be done so in accordance with state and federal laws and by the approval of the TxDOT Project Engineer. The project design for the proposed project includes several hazmat traps to prevent contamination to the environment from spills on the completed roadway. These are discussed in the ***Water Quality and Aquatic Resource Protection Technical Report*** in **Appendix H**.

6.9 Visual and Aesthetic Resources

Impacts to visual and aesthetic resources would be minimized to the maximum extent practicable during the final design of the proposed project. The proposed project would not have

frontage roads, minimizing changes to the overall landscape around the final project due to induced growth and development. Impacts from the proposed project are anticipated to be low to moderate. Moderate impacts can be mitigated through five years of conventional practices as described in FHWA's Visual Impact Assessment for Highway Projects (FHWA, 1988). Mitigation practices include the preservation or enhancement of priority viewpoints through project design.

7.0 COMMENTS AND COORDINATION

Public involvement has been on-going concurrently with the development of the DEIS and FEIS and will continue throughout the project development process. Efforts to date have included public scoping meetings, agency scoping meetings, stakeholder meetings, and an Environmental Listening Workshop. In addition, a project website, electronic newsletters, informational flyers, and social media were employed to facilitate public outreach. Each of these activities is discussed below.

To facilitate public and agency input in the development of the DEIS and FEIS for SH 45SW, the project team developed a Public and Agency Coordination Plan for the project. The plan identified strategies to inform, engage, and respond to stakeholders in a transparent, meaningful and constructive process. Public engagement included electronic communication and face-to-face interaction with stakeholders.

Two open house public meetings were held as part of the EIS scoping process. The first meeting in October 2013 focused on gathering public comment and input on the scope of the study, the draft Coordination Plan, and the proposed project's purpose and need. The second meeting in December 2013 was held to gather public input on the alternatives being considered to fulfill the purpose and need.

7.1 Scoping Meetings

Project team members utilized public scoping meetings to reach out to stakeholders including neighborhood organizations, business groups, environmental organizations, local jurisdictions and citizens to discuss and obtain input on the proposed project. The stakeholder meetings are summarized into two categories: 1) public scoping meetings and 2) agency scoping meetings.

7.1.1 Public Scoping Meetings

Open House – October 8, 2013

An Open House was held by TxDOT and the Mobility Authority on October 8, 2013, to gather input regarding the scope of the SH 45SW Environmental Study. The purpose of the meeting was to gather public comment on the draft Coordination Plan and the proposed project's draft purpose and need. The meeting was held from 5-8 p.m. in the Bailey Middle School cafeteria, 4020 Lost Oasis Hollow, Austin, Texas. The meeting utilized an open house, come-and-go format which allowed citizens to review project materials and speak to TxDOT, Mobility Authority, and the project team on a one-on-one basis. The public meeting summary report for this open house is included in **Appendix L: Public Meeting Summary Reports.**

Prior to the Open House, postcard advertisements were sent to individuals and businesses within the northern Hays/southern Travis County area via the Every Door Direct mailing system. A total of 21,963 postcards were distributed.

TxDOT and the Mobility Authority released a media alert on October 3, 2013, regarding the upcoming Open House. The alert mentioned the opportunity for media outlets to interview project officials and community residents.

Letters and emails were sent to elected officials within the proposed project study area, advising them of the upcoming Open House. A total of 44 elected officials are listed in the project stakeholder database. Emails were sent on September 12, 2013 and letters were mailed on September 17, 2013.

Information on the date, time, location, and purpose of the Open House was posted on the project website, www.SH45SW.com.

Legal notices for the Open House were published in the Austin American-Statesman on Sunday, September 8, 2013 and Saturday, September 28, 2013. Color display advertisements were published in the Community Impact Newspaper on September 19, 2013, (San Marcos/Buda/Kyle) and September 26, 2013 (Southwest Austin), the Hays Free Press on October 2, 2013, and the Oak Hill Gazette on October 3, 2013.

A total of 261 people attended the Open House. Upon arrival at the Open House, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and Mobility Authority (including information on the Virtual Open House),
- SH 45SW fact sheet,
- Comment form,
- Community survey, and
- Email sign-up sheet (for attendees to receive additional project information).

Eighteen informational boards were displayed around the room for public viewing. Maps showing existing land uses and environmental considerations were displayed on tables for the public to view. Attendees were invited to mark or stick notes on the maps in order to draw attention to particular aspects or to identify missing information. Draft copies of the SH 45SW purpose and need statement and Coordination Plan were available in binders at designated tables for public review and comment.

Representatives from TxDOT, Mobility Authority, and the project team were positioned around the room to answer questions, facilitate discussion, and gather input from attendees. In addition, three stations were set up for representatives from CAMPO, Capital Metro, and the

MoPac South Improvement Project to provide the public with information resources on other transportation plans, projects, and initiatives in the area.

Tables were arranged in the middle of the room so attendees could have a place to fill out comment forms and surveys. Two boxes were available on the tables and near the door for attendees to leave their completed comment cards and survey forms. A court reporter was also available to transcribe comments from attendees who desired to give their input verbally.

The Virtual Open House on the project website (www.SH45SW.com) was available for public view October 9-18, 2013. Each exhibit displayed at the Open House meeting was available for view as a PDF file and links were provided for participants to submit official comments and fill out the Community Survey. The October 8 Open House attendees were notified of the Virtual Open House through the welcome letter handout.

The Virtual Open House recorded 888 unique page views during the 10 days it was available. In addition, 73 Community Surveys were filled out as a result of the Virtual Open House.

A total of 488 comments were received during the official comment period, which ran from September 8 to October 18, 2013. Approximately 35 percent of the comments expressed support for the proposed project and 40 percent expressed opposition. The remaining 25 percent expressed neither support nor opposition to the proposed project, but instead provided specific comments regarding some aspect of the proposed project. Many of those expressing their support or opposition also provided specific comments.

Certain themes were prevalent among the comments, including support for SH 45SW to provide an alternative to congested roadways such as Brodie Lane, concern about the environmental impacts of SH 45SW construction and operation, and concern about additional traffic on MoPac. Other themes included preference that the road operate as a non-toll facility, the need for more mass transit options, and the need to evaluate multiple mobility improvement alternatives in addition to SH 45SW.

Open House – December 10, 2013

An Open House was held by TxDOT and Mobility Authority on December 10, 2013. The purpose of the meeting was to gather public input on SH 45SW Environmental Study alternatives being considered to fulfill the purpose and need. The revised purpose and need was available for review. The meeting was held from 5-8 p.m. in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting utilized an open house, come-and-go format which allowed citizens to review project materials and speak to TxDOT, Mobility Authority, and the project team on a one-on-one basis. The public meeting summary report for this open house is included in **Appendix L: Public Meeting Summary Reports**.

Prior to the Open House, an e-newsletter announcing the Open House meeting and summarizing the previous Open House on October 8 as well as other project updates was distributed to the study's stakeholder database.

TxDOT and Mobility Authority released a media alert on December 5, 2013, regarding the upcoming Open House. The alert mentioned the opportunity for media outlets to interview project officials and community residents.

Letters and emails were sent to elected officials within the proposed project study area, advising them of the upcoming Open House. Emails were sent prior to the Open House and letters were mailed on November 26, 2013.

The SH 45SW website (www.SH45SW.com) provided information on the date, time, location, and purpose of the upcoming Open House.

Legal notices for the Open House were published in the Austin American-Statesman on Sunday, November 10, 2013 and Saturday, November 30, 2013. Color display advertisements were published in the Community Impact Newspaper on November 21, 2013 (San Marcos/Buda/Kyle) and November 27, 2013 (Southwest Austin), the Hays Free Press on November 27, 2013 and the Oak Hill Gazette on November 26, 2013.

A total of 146 people attended the Open House. Upon arrival at the Open House, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and Mobility Authority (including information on the Virtual Open House),
- SH 45SW fact sheet,
- Comment form, and
- Email sign-up sheet (for attendees to receive additional project information)

Twenty-five informational boards were displayed around the room for public viewing. The boards included information on the proposed project's purpose and need statement, population growth and traffic volumes, environmental and water quality challenges and solutions, common comment themes from the October 8 Open House, proposed alternatives to satisfy the proposed project purpose and need, project schedule, ways to get involved, and next steps.

Following the boards showing the proposed alternatives, one board asked attendees to write down any additional alternatives that they felt should be included in the environmental study process. Participants wrote down alternatives on small sheets of paper and stuck them to the board for further consideration by the project team.

Representatives from TxDOT, Mobility Authority, and the project team were positioned around the room to answer questions, facilitate discussion, and gather input from attendees. In addition, one station was set up for the MoPac South Improvement Project.

Tables were arranged in the middle of the room so attendees could have a place to fill out comment forms and surveys. Several boxes were available on the tables and near the door for attendees to leave their completed comment forms. A court reporter was also available to transcribe comments from attendees who desired to give their input verbally.

The Virtual Open House on the project website (www.SH45SW.com) was available for public view December 11-20, 2013. Each exhibit displayed at the Open House meeting was available for view as a PDF file and links were provided for participants to submit official comments. The December 10 Open House attendees were notified of the Virtual Open House through the welcome letter handout.

The Virtual Open House recorded 500 unique page views during the 10 days it was available for view.

A total of 153 comments were received during the official comment period, which ran from November 10 to December 20, 2013. Approximately 26 percent of the 153 comment submissions expressed support for the proposed project and 32 percent expressed opposition. The remaining 42 percent expressed neither support nor opposition to the proposed project but instead provided specific comments regarding some aspect of the proposed project. It should also be noted that many of those expressing either support or opposition also provided specific comments.

Certain themes were prevalent among the comments, including support for SH 45SW to be built as soon as possible, concern about the environmental impacts of SH 45SW construction and operation (particularly water quality), and concern that SH 45SW would not substantially improve travel times. Several comments referenced the “Dynamic Traffic Study of State Highway 45 Southwest” recently prepared for CAMPO. Other themes included the need for more alternative transportation options (bus, rail, park, and ride facilities), preference that the road operate as a non-toll facility, and the importance of improving existing roads/highways (particularly Brodie Lane, Manchaca Road, IH 35, and SH 130).

A total of 23 suggestions were placed on the “Other Alternatives” board which invited participants to list additional alternatives to fulfill the project’s purpose and need. These suggested alternatives included building and operating Lone Star Rail, additional bus/light rail service and park and ride lots, expanding and improving existing roads and highways (Brodie Lane, Manchaca Road, and IH 35), and constructing SH 45SW as a non-toll road.

7.1.2 Agency Scoping Meetings

Two agency scoping meetings were held to gather input and address questions from participating agencies. The objectives of each agency scoping meeting mirrored the public scoping meetings. During the first meeting, TxDOT and the project team worked together with

participating agencies including USFWS, Travis County, BSEACD, COA, and TPWD to identify and address issues of concern regarding the project's environmental or socioeconomic impacts.

- July 31, 2013 – Agency Scoping Meeting 1

Topics discussed at the July 2013 agency scoping meeting included schematic changes since the 1989 EIS and whether any issues from the EIS would be restudied under the project; concerns for karst features and water quality issues around the study area; the desire for a more detailed environmental resources assessment; design elements; creation of a working group for karst/water quality issues; coordination with COA on the planned Violet Crown Trail; build/no-build consequences; and the agency scoping map.

A second scoping meeting was held with participating agencies to discuss the overall project status and preliminary alternatives.

- December 10, 2013 – Agency Scoping Meeting 2

Items covered at the December 2013 meeting included the status of work group meetings; alternative boards for display at the upcoming open house; CAMPO's Regional Transportation Plan, which calls for SH 45SW to be a four-lane divided toll road; and the importance of stakeholder input.

7.2 Stakeholder Meetings

The purpose of stakeholder meetings is to provide information on the status of the proposed project and inform stakeholders of any upcoming public meetings. Project team members discuss all aspects of the proposed project with stakeholders, receive their input, and answer questions. The input received allows the project team to better address community priorities as alternatives are refined and the environmental study progressed. Stakeholders included local neighborhood and community groups, organizations, major employers, chambers of commerce, interested citizens, and other groups. In addition to general information about the project, discussion topics were tailored to the needs/questions of the stakeholder(s). These specific topics included how the proposed project might impact a business or community; possibility of adjacent landowners dedicating land for open space and/or trails; and water quality.

Stakeholders are able to request briefings through TxDOT or the project website. The table below lists stakeholder meetings held. Summaries of these meetings are on file at TxDOT.

Table 7.2-1: SH 45SW Stakeholder Meetings

Meeting Date	Stakeholder Group
8/26/2013	T.J. Higginbotham
8/27/2013	Kyle City Council Member, David Wilson
8/27/2013	Mountain City Council Member, Lee Taylor
8/28/2013	Chaparral Park Homeowners' Association (HOA) Member, Alan Hedges
8/28/2013	Chaparral Park HOA Member, Angela Streeter
8/28/2013	Landowner, Bill Walters
8/28/2013	Hill County Conservancy Executive Director, George Cofer
8/28/2013	Chaparral Park HOA Member, John Kinzelman
8/28/2013	Chaparral Park HOA Member, Justin Kretchmar
8/28/2013	Hays Free Press Reporter/Editor, Kim Hilsenbeck
8/28/2013	Chaparral Park HOA Member, Melissa Friendsly
8/28/2013	Chaparral Park HOA Member, Regina Burchette
8/28/2013	Chaparral Park HOA Member, Sharon Huffar
8/29/2013	Buda Fire Chief, Clay Huckaby
8/29/2013	Chaparral Park HOA Member, Joshua Parten
8/29/2013	Barton Springs Edwards Aquifer Conservation District Chair, Mary Stone
8/30/2013	Buda/Kyle Republicans
8/30/2013	Chaparral Park HOA Member, Lori Jondron
8/30/2013	Owner of Porter Ranch, Mary Louise Porter Bailey and husband
9/03/2013	Mountain City Events Coordinator, Amy Hilton
9/03/2013	Republican Pct. Chair/Neighborhood Advocate, Clay Dover
9/03/2013	Democrat Pct. Chair/Neighborhood Advocate, Donna Haschke
9/03/2013	Democrat Pct. Chair/Oak Forest Neighborhood Advocates Dave Kettler & Liz Strand
9/03/2013	Buda First Leader/Advocate, David Patterson
9/03/2013	Republican Pct. Chair/Neighborhood Advocate, Darryl Swan
9/03/2013	Elliott Ranch HOA, Lauren Miller
9/03/2013	Democrat Pct. Chair/Buda Advocate, Rachel Najera
9/03/2013	Republican Pct. Chair/Neighborhood Advocate, Stuart Hoyt
9/03/2013	Tejano Democrats President/Buda Advocate, Sandra Tenorio
9/04/2013	San Marcos Mercury, Brad Rollins
9/04/2013	Garlic Creek Leaders, Katie & Graham Moore
9/04/2013	Democrat Pct. Chair/Neighborhood Advocate, Ed Mears
9/04/2013	Ruby Ranch HOA, Tim Dowling
9/04/2013	Hays Country Oaks, Lydia Galvan
9/04/2013	Cullen Country, Terry Caps
9/05/2013	Cullen Country, Bill Talbot
9/06/2013	Oak Forest HOA, Do & Lisa Perez, Kathryn Luckett, Michael Bishop, Nelson & Alice Smith
9/06/2013	City of Kyle Assistant Manager, James Earp
9/06/2013	Southern Woods HOA, Juliette Miller
9/06/2013	Keep Mopac Local Advocate, Jonathan Ogren
9/06/2013	City of Buda Manager, Kenneth Williams & Planning Director, Chance Sparks
9/06/2013	Mountain City Mayor/Neighborhood Leader, Tiffany Curnutt
9/09/2013	Southern Woods HOA, Paul Kaskie
9/13/2013	Buda Fire Chief, Clay Huckaby (Meeting No. 2)

Table 7.2-1: SH 45SW Stakeholder Meetings cont'd

Meeting Date	Stakeholder Group
9/13/2013	Cullen Country, Dawn Hewitt
9/13/2013	Environmental Leader, Jim Camp
9/13/2013	Greater San Marcos Partnership Board Member, Patrick Rose
9/17/2013	Emergency Services District Board Member, Halley Ortiz
9/19/2013	Hays Hills Minister/Neighborhood Leader, David Sweet
9/20/2013	Activist/Neighborhood Leader, Brad Hagen
9/23/2013	Mountain City Planning Director, Don Roshuber
9/27/2013	Buda/Kyle Republican Chair, Alice Chisholm and husband
9/27/2013	Hays County Democrats Executive Director, Jon Leonard
9/28/2013	Presidio Alma HOA, Neva Lockett, Mike & Kim Fry, Frank Hernandez
9/28/2013	Hays County Attorney, Mark Kennedy & Environmental Director, Clint Garza
9/30/2013	Leisurewoods HOA, Mike Smith
10/01/2013	Hays County Neighborhood Leaders, Tillie Trotter, Rosie Boncle, Mike Smith, Mary Jo & Ben LaRue, Gayle Meister
10/01/2013	National Night Out: Neighborhoods visited include Hays Country Oaks II, Ruby Ranch, Cullen Country/Garlic Creek, Shadow Creek, Southern Woods, Coves of Cimarron, Oak Forest, Elliot Ranch, Leisurewoods, Bradfield Village & Mountain City
10/02/2013	Neighborhood Leader, Vicki Senefeld
10/15/2013	South Texas United Democrats
10/17/2013	City of Kyle Mobility Committee: Council Member, Samantha LeMense; Committee Members Gayle Meister, Lucy Kirkby, John Atkins, Brad Growt, Joe Bacon, & Danton Bankay
01/05/2014	Circle C Homeowners Association

Source: NLA, 2014

7.3 Environmental Listening Workshop

TxDOT and the Mobility Authority hosted an environmental listening workshop on November 14, 2013. The purpose of the listening workshop was to gather information and identify any environmental issues or concerns from the community relating to SH 45SW and the study area.

An initial email invitation was sent on October 4, 2013 to representatives of organizations including Friendship Alliance of North Hays County; Hill Country Alliance; HCC; Keep MoPac Local; Nature Conservancy of Texas; Oak Hill Trails Association; Sierra Club; Save Barton Springs; Save Our Springs; Save Bear Creek Association; Save Our Springs Alliance; Edwards Aquifer Conservation District; Wildflower Research Center; Texas Water & San Marcos River Foundation; and the Center for Biological Diversity. A second email invitation was sent on November 5, 2013 to this same list, as well as to individuals who indicated that they were interested in environmental issues at the Open House/Public Scoping Meeting on October 8th. Follow-up phone calls were made prior to the workshop for those individuals who provided telephone numbers.

Attendees were divided into four groups to review maps showing environmental constraints in the study area and identify environmental features that were missing. Each group reported to the full workshop their environmental issues and concerns.

Issues identified by participants included: roadway and hazardous materials runoff, floodplain and retention pond locations, noise mitigation, light pollution, endangered species and other wildlife, air quality, transit service, development along SH 45SW, and the use of smart engineering and environmentally safe design.

7.4 Additional Public Outreach

7.4.1 SH 45SW Website (www.SH45SW.com)

A project website was launched September 16, 2013 for the SH 45SW Improvement Project (www.SH45SW.com) to provide the public with information regarding the proposed project in its entirety. The website includes four general categories (About, Multimedia, Latest, and Environmental) where the public can view various areas of the proposed project in more detail.

The **About** section provides a general project overview and an FAQ section. The **Multimedia** section provides the public with a study area map and a conceptual rendering of the proposed project. The **Latest** section is where the public can view upcoming events, sign up for e-newsletters, and access past and current e-newsletters. The fourth section, **Environmental**, provides an environmental overview of the study, documentation of public input, and information about environmental concerns, including the Green Mobility Challenge.

In addition to providing the public with project information, the website provides a **Contact Us** section for the public to call or email with questions or comments. They can also subscribe to the e-newsletter or follow the project via Twitter.

Information regarding comments received through the project website from the Open House meetings and Public Hearing is included in the summary reports in **Appendix L: Public Meeting Summary Reports**.

7.4.2 Electronic Newsletters, Informational Flyers and Social Media

Two electronic newsletters and two informational flyers were developed and distributed to the email database of 1,021 persons as well as posted at www.SH45SW.com. The intent of the newsletters and flyers is to inform citizens and interested parties about the current activities of the proposed project including open houses, workshops, and other public meetings. They also help keep people informed about other aspects of the proposed project, including the timeline; how to contact project teams with questions or comments; and information on the on-

going environmental study, including the process for evaluating and reducing the number of alternatives. The publish dates of the e-newsletters sent were:

- October 3, 2013 – e-newsletter 1
- December 5, 2013 – e-newsletter 2

The two e-flyer publish dates were:

- November 26, 2013 – SH 45SW Update
- December 12, 2013 – Visit the Virtual Open House for SH 45SW

Social media efforts included 21 tweet messages on topics announcing the proposed project, promoting the website and public involvement opportunities including open house public meetings and Virtual Open Houses.

7.4.3 Technical Work Groups

A Technical Work Group was established to develop a process to identify and implement BMPs that address the concerns raised by the public, environmental groups, and other stakeholders. Agencies/entities participating in the workgroup include: BSEACD, COA, Hays and Travis Counties, Texas State University, TPWD, TxDOT, Mobility Authority, and the project team. These meetings were held on:

- October 9, 2013 – Technical Work Group 1
- December 5, 2013 – Technical Work Group 2
- May 28, 2014 – Technical Work Group 3
- July 25, 2014 – Technical Work Group 4
- September 25, 2014 – Technical Work Group 5

Engineering Work Group

The Engineering Work Group was established to leverage the collective abilities and knowledge of the organizations involved and to apply the benefits of that collective strength to identify the most efficient and effective BMPs to be applied to the proposed project. Meetings included site visits to COA Water Treatment Plant #4 and the US 290 construction site to evaluate performance of BMPs during construction. Members of the technical work group include COA, Hays and Travis Counties, BSEACD, TxDOT, Mobility Authority, and the project team. These meetings were held on:

- October 9, 2013 – Engineering Work Group
- October 24, 2013 – Engineering Work Group
- November 20, 2013 – Engineering Work Group

Biology & Karst Work Group

The Biology and Karst Work Group was established to identify potential ecological and water quality issues of the proposed project and to collaborate on possible solutions to these issues, using the knowledge and expertise of member agencies. A work group meeting was held to hear an update on karst issues related to the proposed project and discuss schematic and engineering issues. Attendees of the January 2014 work group meeting included representatives of the BSEACD, COA, TPWD, Travis County, TxDOT, Mobility Authority, and the project team. This meeting was held on:

- January 22, 2014 – Biology & Karst Work Group

These Technical Work Group, Engineering Work Group, and Biology and Karst Work Group meetings have documented that, from an agency standpoint, the key resources for investigation of potential impacts are associated with water quality and quantity, including surface and groundwater, karst features, and aquifer-dependent species associated with the Barton Springs portion of the Edwards Aquifer.

7.5 Public Hearing

A Public Hearing was held by TxDOT and the Mobility Authority on July 29, 2014, to gather input regarding SH 45SW. The purpose of the hearing was to give the community an opportunity to share thoughts on the preferred alternative and its potential environmental impacts, as detailed in the Draft EIS. The Draft EIS was available for review at the hearing and at www.sh45sw.com on June 27, 2014 and remains available on the website. The Draft EIS, maps, and other information concerning the proposed project were available for public inspection from June 29 to August 13, 2014 at the TxDOT Austin District Office, located at 7901 N IH 35, Austin, TX, 78753. The Draft EIS was on file and available for public inspection at the following locations:

- TxDOT Environmental Affairs Division, 118 E. Riverside Drive, Austin, TX 78704;
- Austin Public Library, Hampton Branch at Oak Hill, 5125 Convict Hill Rd., Austin, TX 78749;
- Austin Public Library, Pleasant Hill Branch, 211 E. William Cannon Dr., Austin, TX 78745;
- Buda Public Library, 303 Main St., Buda, TX 78610

The hearing was held in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting included an open house between 5-6 p.m., followed by technical presentations and a public comment period. A total of 490 people signed in from the general public at the Public Hearing.

Prior to the Public Hearing, postcard advertisements were sent to individuals and businesses within the northern Hays/southern Travis County area via the Every Door Direct mailing system. A total of 21,531 postcards were distributed.

TxDOT issued a news release on July 3, 2014 announcing the SH 45SW environmental study was available for public review and that a Public Hearing would be held on July 29, 2014. TxDOT and the Mobility Authority released a media alert on July 28, 2014 regarding the upcoming Public Hearing. The alert summarized the project and mentioned the opportunity to review the environmental document and other project information.

Postcards were mailed on July 14, 2014 to property owners adjacent to the preferred alternative.

Emails were sent to elected officials within the project study area on July 18, 2014, advising them of the upcoming Public Hearing. E-newsletters announcing the Public Hearing were distributed on July 2, 2014 and July 22, 2014 to 1,504 email addresses within the study's stakeholder database.

A legal notice for the Public Hearing was published in the *Austin American-Statesman* on Sunday, June 29, 2014. Color display advertisements were published in the *Oak Hill Gazette* on July 10, 2014, the *Hays Free Press* on July 16, 2014, the *Austin American-Statesman* on July 20, 2014, and the *Community Impact Newspaper* on July 17, 2014 (San Marcos/Buda/Kyle) and July 24, 2014 (Southwest Austin).

Upon arrival at the Public Hearing, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and the Mobility Authority (including information on the Virtual Open House)
- Public Hearing agenda
- SH 45SW conceptual renderings
- Right-of-way information
- SH 45SW fact sheet
- Comment form

The open house utilized a come-and-go format where the public was able to review proposed project exhibits and discuss the environmental study process with project staff.

During the comment period, members of the public were invited to comment on issues related to SH 45SW. Speakers were each given a three-minute time period to express their thoughts. A total of 41 people spoke at the hearing. A court reporter transcribed each comment.

Twelve informational boards were displayed around the room for public viewing. Four large-format maps were displayed on a wall and on tables showing detailed schematics of the proposed SH 45SW facility. Representatives from TxDOT, the Mobility Authority, and the study team were positioned around the room to answer questions, facilitate discussion, and gather input from attendees.

Tables were arranged towards the back of the room so attendees could have a place to fill out comment forms. Several boxes were available on the tables and near the door for

attendees to leave completed comment forms. A court reporter was also available to transcribe comments from attendees who wanted to provide verbal input.

The Virtual Open House on the project website (www.sh45sw.com) was available for public view July 29 – August 13, 2014. Each exhibit displayed at the Public Hearing was available for view as a PDF file, and links were provided for participants to submit official comments. The Public Hearing attendees were notified of the Virtual Open House through the welcome letter handout. An e-newsletter was sent on August 7, 2014 to the study's stakeholder database, which informed recipients the Virtual Open House was open and official comments could be submitted. The Virtual Open House recorded 515 unique page views during the 16 days it was available for view.

A total of 1,208 public comment submissions were received during the official comment period, which ran from Sunday, June 29, 2014, to Wednesday, Aug. 13, 2014. Certain themes were prevalent among the comments, including support for SH 45SW to be built as soon as possible, concern about the environmental impacts of SH 45SW construction and operation (particularly water quality), and concern regarding the scope and completeness of the Draft EIS document. Other commenters had specific questions or comments about the design of the facility itself and how it would interact with other roadways and projects in the region. The Public Hearing Summary and Analysis is located in **Appendix L: Public Meeting Summary Reports**.

Approximately 23 percent of the comment submissions expressed support for the proposed project and 73 percent expressed opposition. The remaining 5 percent expressed neither support nor opposition to the proposed project but instead provided specific comments regarding some aspect of the proposed project.[12]

[12] Total exceeds 100 percent because percentages have been rounded to the nearest whole number.

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8.0 REFERENCES

1.0 PURPOSE AND NEED FOR ACTION

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- 2004. *Austin Metropolitan Area 2025 Transportation Plan*.
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2.0 ALTERNATIVES

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Land Use

Capital Area Metropolitan Planning Organization (CAMPO).

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9.0 LIST OF ABBREVIATIONS

A

AADT ..... average annual daily traffic
AASHTO ..... American Association of State Highway and Transportation Officials
ADT ..... average daily traffic
ACM ..... asbestos containing material
ACS ..... American Community Survey
ACT ..... Antiquities Code of Texas
AISD ..... Austin Independent School District
amsl ..... above mean sea level
AOI ..... area of influence
APE ..... area of potential effect
AST ..... Aboveground Storage Tank
ASTM ..... American Society of Testing and Materials
Atlas ..... Archeological Sites Atlas

B

BCCP ..... Balcones Canyonlands Conservation Plan
BCP ..... Balcones Canyonlands Preserve
BMP ..... best management practice
BSEACD ..... Barton Springs/Edwards Aquifer Conservation District

C

CAAA ..... Clean Air Act Amendments
CAC ..... Central Texas Clean Air Coalition
CAMPO ..... Capital Area Metropolitan Planning Organization
Capital Metro ..... Capital Metropolitan Transportation Authority
CARTS ..... Capital Area Rural Transportation System
CDP ..... census designated place
CEQ ..... Council on Environmental Quality
CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS ..... Comprehensive Environmental Response, Compensation
..... and Liability Information System

CFR ..... Code of Federal Regulations
cfs ..... cubic feet per second
CGP ..... Construction General Permit
CISD ..... Consolidated Independent School District
COA ..... City of Austin
CWA ..... Clean Water Act
CZP ..... Contributing Zone Plan

D

dB ..... decibel
dBA ..... A-weighted decibel
DDZ ..... Desired Development Zone
DEIS ..... Draft Environmental Impact Statement
DHHS ..... US Department of Health and Human Services
Diesel PM ..... diesel exhaust organic gases
DWPZ ..... Drinking Water Protection Zone

E

EAC ..... Early Action Compact
EAP ..... Edwards Aquifer Permit
ECMP ..... Environmental Compliance Management Plan
Edwards Aquifer ..... Edwards Balcones Fault Zone Aquifer
EIS ..... Environmental Impact Statement
EJ ..... Environmental Justice
EMST ..... Ecological Mapping Systems of Texas
EO ..... Executive Order
EPA ..... US Environmental Protection Agency
EPCRA ..... Emergency Planning and Community Right-to-Know Act
EPIC ..... Environmental Permits, Issues, and Commitments
ERNS ..... Emergency Response Notification System
ESA ..... Endangered Species Act
ETC ..... Electronic Toll Collection
ETJ ..... extraterritorial jurisdiction

F

FEIS.....Final Environmental Impact Statement
FEMA.....Federal Emergency Management Agency
FHWA.....Federal Highway Administration
FIRM..... Flood Insurance Rate Maps
FM .....Farm-to-Market Road
FPPA ..... Farmland Protection Policy Act

G

GeoSearch..... GeoSearch LP
GIS ..... Geographic Information Systems

H

HEI..... Health Effects Institute
HCC.....Hill Country Conservancy
HOA.....Homeowners' Association
HOV.....high occupancy vehicle

I

IEC.....Institutional and Engineering Controls
IP .....Individual Permit
IRIS.....Integrated Risk Information System
ITS ..... Intelligent Transportation Systems

J

K

L

LBP.....lead based paint
LCRA .....Lower Colorado River Authority
LEP..... Limited English Proficiency
Leq..... Equivalent Steady-State Sound Level
LPST.....Leaking Petroleum Storage Tank

M

Magnuson-Stevens Act ..... Magnuson-Stevens Fishery and Conservation Management Act
MBTA ..... Migratory Bird Treaty Act
Mobility Authority ..... Central Texas Regional Mobility Authority
MOU ..... Memorandum of Understanding
MOVES ..... Motor Vehicle Emission Simulator
MS4 ..... Municipal Separate Storm Sewer System
MSA ..... Metropolitan Statistical Area
MSAT ..... Mobile Source Air Toxics
MUD ..... municipal utility district

N

NAAQS ..... National Ambient Air Quality Standards
NAC ..... Noise Abatement Criteria
NAC B ..... noise level for residential land use activity
NATA ..... National Air Toxics Assessment
NFIP ..... National Flood Insurance Program
NFRAP ..... No Further Remedial Action Planned
NHD ..... National Hydrography Dataset
NHL ..... National Historic Landmark
NMFS ..... National Marine Fisheries Service
NOAA ..... National Oceanic and Atmospheric Administration
NOI ..... Notice of Intent
NPDES ..... National Pollutant Discharge Elimination System
NPL ..... National Priorities List
NRCS ..... Natural Resources Conservation Service
NRHP ..... National Register of Historic Places
NWI ..... National Wetlands Inventory
NWP ..... Nationwide Permit

O

O3 ..... Ozone
OHWM ..... Ordinary High Water Mark
OR ..... Orif Soils mapping unit

P

PA-TU ..... Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings
PCN ..... Pre-Construction Notification
PCR ..... Project Coordination Request
PFC ..... Permeable Friction Course
PS&E ..... plans, specifications, and estimates
PST ..... Petroleum Storage Tank

Q

R

RCRA ..... Resource Conservation and Recovery Act
RCRIS ..... Resource Conservation and Recovery Information System
REC ..... recognized environmental condition
RHCP ..... Hays County Regional Habitat Conservation Plan
RM ..... Ranch-to-Market Road
ROW ..... right-of-way
RSA ..... Resource Study Area
RTHL ..... Registered Texas Historic Landmark
RTP ..... Regional Transportation Plan

S

SAL ..... State Antiquities Landmark
SGCN ..... Species of Greatest Conservation Need
SH ..... State Highway
SHPO ..... State Historic Preservation Officer
SPILLS ..... Spill Incident List
SPUI ..... single-point urban intersection
SWCA ..... SWCA Environmental Consultants
SWMLF ..... Solid Waste Municipal Landfill Facility
SWPP ..... Source Water Protection Program
SW3P ..... Stormwater Pollution Prevention Plan

T

TAC ..... Texas Administrative Code
T&E..... threatened and endangered
TAZ..... Traffic Analysis Zone
TCAP ..... Texas Conservation Action Plan
TCEQ..... Texas Commission on Environmental Quality
TDM..... Traffic Demand Management
THC ..... Texas Historical Commission
TIER II ..... Tier II Chemical Reporting Program Facilities
TIP ..... Transportation Improvement Program
TPDES..... Texas Pollutant Discharge Elimination System
TPWD ..... Texas Parks and Wildlife Department
TRRC..... Texas Railroad Commission
TSD ..... Treatment, Storage, and Disposal
TSM ..... Transportation System Management
TSS..... total suspended solids
TTI ..... Texas Transportation Institute
TWDB ..... Texas Water Development Board
TxDOT ..... Texas Department of Transportation
TXNDD ..... Texas Natural Diversity Database

U

US..... United States Highway
USACE ..... US Army Corps of Engineers
USC ..... United States Code
USDA..... US Department of Agriculture
USFWS..... US Fish and Wildlife Service
USGS ..... US Geological Survey
UST ..... Underground Storage Tank

V

VCP ..... Voluntary Cleanup Program
VFS..... vegetative filter strips
VMT ..... vehicle miles travelled
vpd..... vehicles per day

VSS ..... volatile suspended compounds

W

WPAP .....Water Pollution Abatement Plan

WQPL .....Water Quality Protection Land

WSC .....water services company

X

Y

Z

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APPENDIX A
PLANNING DOCUMENTS

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Fig. 7 Planned Toll Roads and Managed Lanes

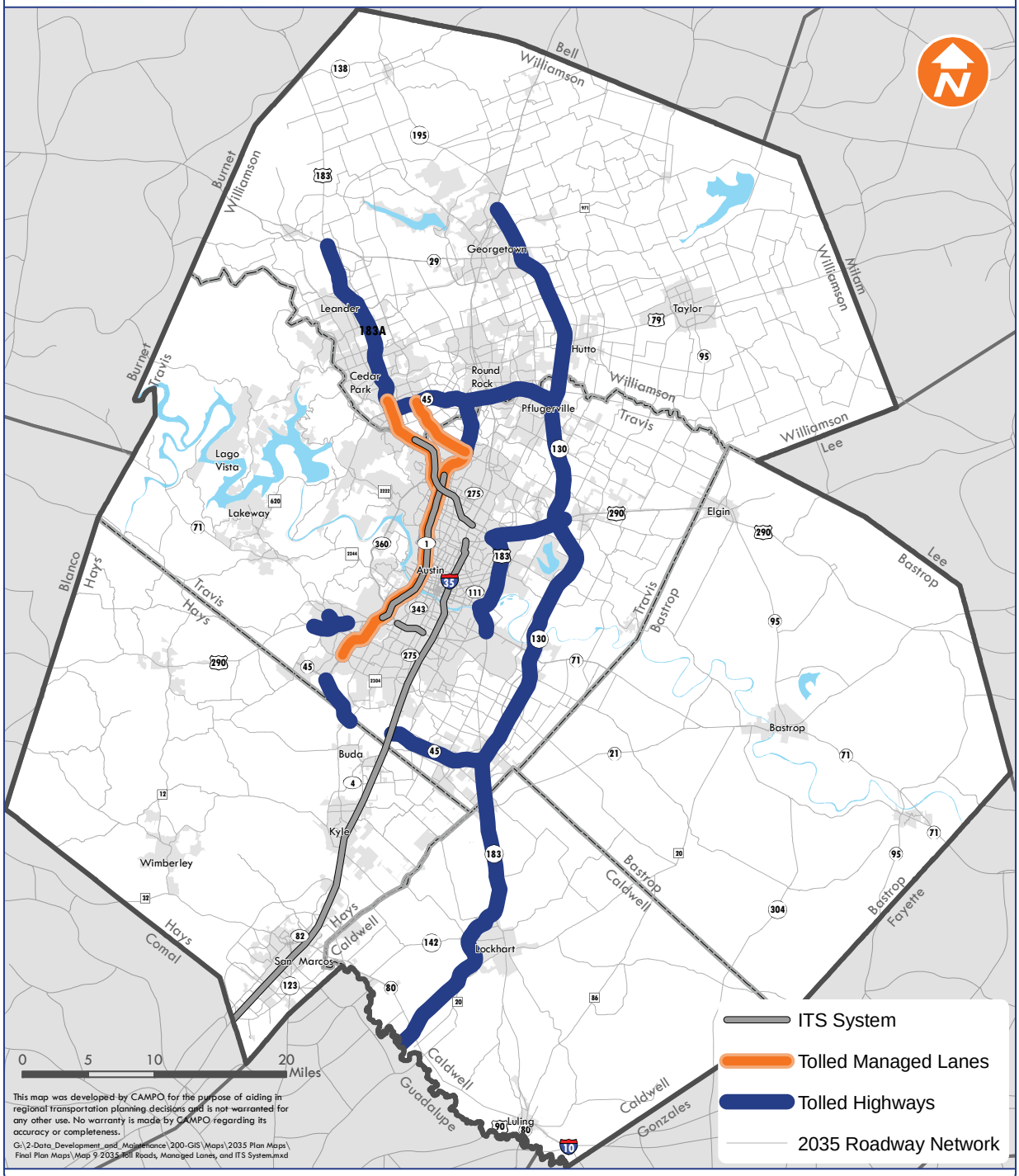
Planned Toll Roads and Managed Lanes

Funding/Sponsor	Project	Limits	Open Year	Description
Toll Roads and Toll Express Lanes				
Regional/ CTRMA	183A North Extension Project: 183A-2	0.1 miles N of FM 1431 to 1.5 miles N of RM 2243	2012	Engineering and construction of six tolled mainlanes, access ramps, and a shared-use path. Existing continuous non-tolled frontage roads will be maintained.
Regional/ CTRMA	183A North Extension Project: 183A-3	1.5 miles N of RM 2243 to 0.4 miles S of S San Gabriel River	2013	Engineering and construction of six tolled mainlanes, access ramps, and a shared-use path. Existing continuous non-tolled frontage roads will be maintained.
Regional/ TXDOT/CTRMA	US 183 (S)	Springdale Road - N. of Boggy Creek (segment 1)	2017	Engineering, ROW acquisition, utility relocation, and construction of ultimate 6 lane turnpike with 3 lane non-tolled frontage roads in each direction. Project may be phased.
Regional/ TXDOT/CTRMA	US 183 (S)	Boggy Creek to Patton Ave (segment 2)	2020-2025	Engineering, ROW acquisition, utility relocation, and construction of ultimate 6 lane turnpike with 3 lane non-tolled frontage roads in each direction. Project may be phased.
Regional/ TXDOT/CTRMA	US 290 (W) ("Y" at Oak Hill)	Circle Drive to Joe Tanner Lane	2019	Engineering, ROW acquisition, utility relocation, and construction of ultimate 6 lane turnpike with 2 lane non-tolled frontage roads in each direction. Project may be phased.
Regional/ TXDOT/CTRMA	US 290 (E)	East of US 183 to east of FM 734 (Parmer Lane)	2015	Engineering, ROW acquisition, utility relocation and construction of 6 tolled mainlanes and 6 continuous, non-tolled access road lanes.
Regional/ CTRMA	Loop 1 Managed Lanes (Phase I)	FM 734 to Cesar Chavez interchange	2015	Phase I: Construct northbound and southbound managed lanes
Regional/ TXDOT/CTRMA	Loop 1 Managed Lanes (Phase II)	Cesar Chavez - Slaughter	2017	Cosntruct 1 managed lane in each direction.
Regional TXDOT/CTRMA	SH 45 (SW)	Loop 1 - FM 1626	2020-2025	Construct 4 lane toll freeway.
Regional/ TXDOT/CTRMA	SH 71 (W) ("Y" at Oak Hill)	Silvermine to US 290 W	2017	Engineering, ROW acquisition, and construction of 2 tolled direct connector bridges from US 290 (W) and continuous non-tolled access road lanes
Regional/ TXDOT-TTA	SH 130, Segment 5	SH 45 SE - FM 1185	2012	Construct 4 lane toll freeway with intermittant frontage roads.
Regional/ TXDOT-TTA	SH 130, Segment 6	FM 1185 - IH 10	2012	Construct 4 lane toll freeway with intermittant frontage roads
Local/ Williamson County/CTRMA	US 183 (N)	SH 29 to 183 A	2026-2035	Construct 4 tolled mainlanes
Local/ Williamson County	Parmer Ln/FM 734 Express Lanes	RM 620 - Loop 1	2017	Add toll express lanes (1 in each direction) in median
Non-Tolled Managed Lanes				
Regional (Unsponsored)	US 79/Northeast Bus only lanes	IH 35 to SH 130	2026-2035	Provide priority lanes for buses or implement other strategy to increase person throughput in the US 79 corridor.
Regional (Unsponsored)	FM 969/Central Bus Only Lanes	Lamar/US290 to SH130/969	2026-2035	Provide a priority lane for buses or implement other strategy to increase person throughput in the South Lamar/MLK corridor.
Regional (Unsponsored)	N Burnet/S Congress Bus only lanes	Burnet at Loop 1 to Slaughter	2026-2035	Provide a priority lane for buses or implement other strategy to increase person throughput in the corridor.
Regional (Unsponsored)	N Lamar Bus only lanes	Tech Ridge Park and Ride to Downtown Austin	2026-2035	Provide a priority lane for buses or implement other strategy to increase person throughput in the corridor.
Regional (Unsponsored)	Parmer Bus Only Lanes	Lakeline to US 290	2026-2035	Provide a priority lane for buses or implement other strategy to increase person throughput in the corridor.
Regional (Unsponsored)	Slaughter Bus Only Lanes	US290/Convict Hill - US 183	2026-2035	Provide a priority lane for buses or implement other strategy to increase person throughput in the Slaughter corridor.
Regional (Unsponsored)	Southeast Bus only lanes	Brazos to SH 130	2026-2035	Provide priority lanes for buses or implement other strategy to increase person throughput in the East Seventh/US 183 S/SH 71 E corridor.

Map 9: Toll Roads, Managed Lanes, and ITS System

CAMPO Region

May 24, 2010



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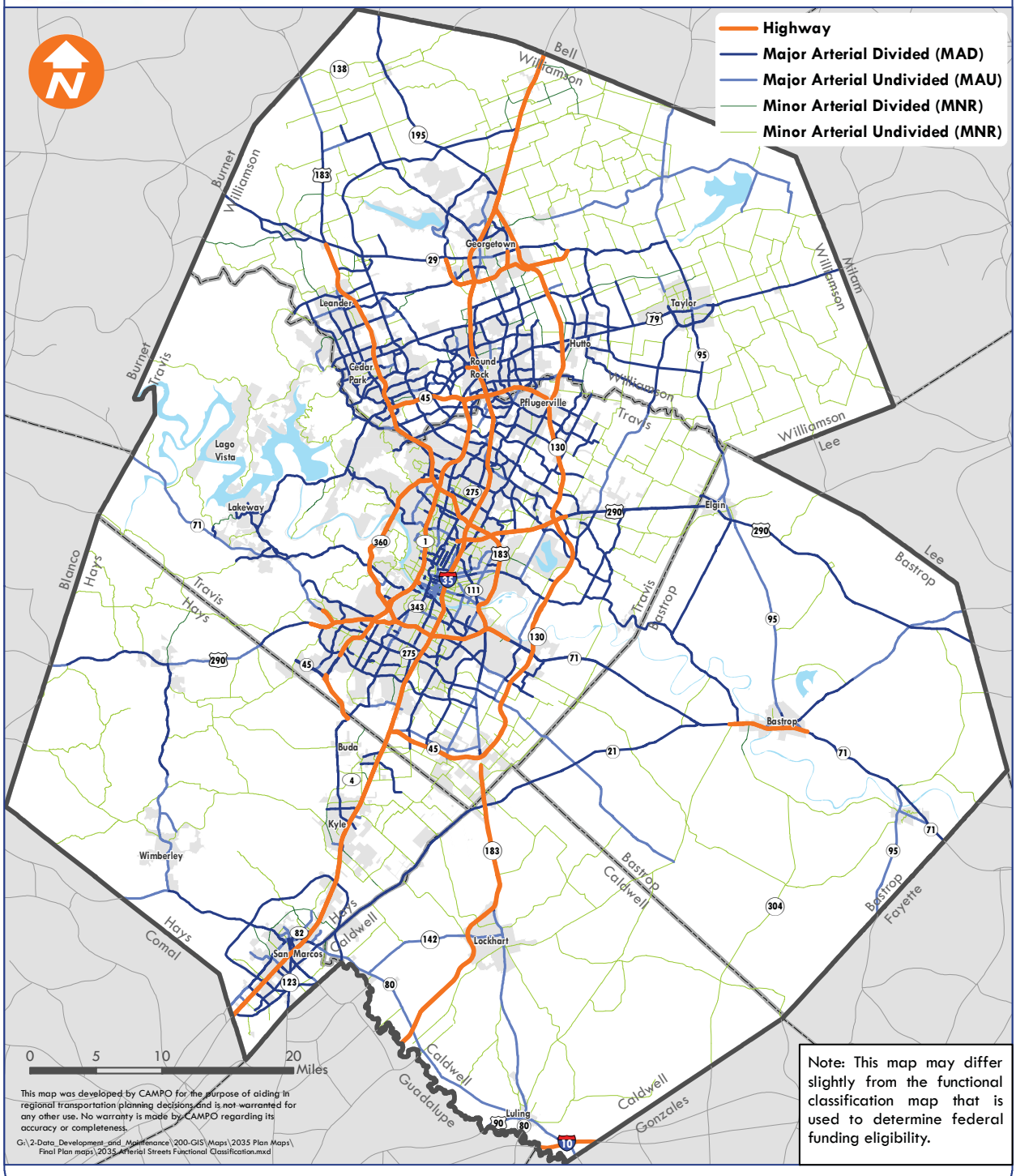
CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION www.CAMPOTexas.org

Prirority	ID	Project Type	Sponsor	Project	Limits/Location	Let Year	Open Year	YOE Cost (Millions)	Description
Short Term	38	New Freeway	TxDOT	US 290 (E)	East of US 183 to east of FM 734 (Parmer Lane)	2011	2015	466.2	Engineering, ROW acquisition, utility relocation and construction of 6 tolled mainlanes and 6 continuous, non-tolled access road lanes.
Short Term	321	Expand Arterial	TxDOT	US 290 (E) Safety Project and Hurricane Evacuation Route	1 mile east of FM 696 to Lee County Line	2015	2018	57.1	Reconstruct existing 4 lane undivided rural principal arterial to a 4 lane divided rural principal arterial. (Contingent on Proposition 12 funding.)
Short Term	37	Managed Lanes	TxDOT/CTRMA	Loop 1 Managed Lanes (Phase I)	FM 734 to Cesar Chavez interchange	2013	2015	252.5	Phase I: Construct northbound and southbound managed lanes
Short Term	286	Managed Lanes	TxDOT/CTRMA	Loop 1 Managed Lanes (Phase II)	Cesar Chavez - Slaughter	2015	2017	290	Cosntruct 1 managed lane in each direction.
Short Term	311	Interchange/Overpass	TxDOT	Loop 1 Grade Seperation	Davis Ln	2015	2017	23	Implement grade separation at select intersections
Short Term	312	Interchange/Overpass	TxDOT	Loop 1 Grade Seperation	Slaughter Ln	2015	2017	23	Implement grade separation at select intersections
Short Term	43	Expand Arterial	TxDOT	Loop 275 / S. Congress	Eberhart Lane - Foremost Drive (1.1 miles)	2011	2013	12.0	Reconstruct existing 2 lane undivided major arterial roadway to a 4 lane divided major arterial roadway with bicycle and pedestrian accommodations. Roadway will accommodate Bus Rapid Transit.
Long Term	244	Expand Arterial	TxDOT	SH 21 (Bastrop County)	SH 71 to Caldwell County Line	2020-2025	2026-2035	54	Widen to 4 lane divided major arterial.
Short Term	39	New Freeway (Design Only)	TxDOT	SH 45 (SW)	Loop 1 - FM 1626	2012	2014	6.0	Engineering, ROW acquisition, and utility relocation.
Medium Term	251	New Freeway	TxDOT/CTRMA	SH 45 (SW)	Loop 1 - FM 1626	2020-2025	2020-2025	93.5	Construct 4 lane toll freeway.
Short Term	91	New Freeway	TxDOT	SH 71 (W) ("Y" at Oak Hill)	Silvermine to US 290 W	2015	2017	229.1	Engineering, ROW acquisition, and construction of 2 tolled direct connector bridges from US 290 (W) and continuous non-tolled access road lanes
Short Term	42	New Freeway	TxDOT	SH 71 (E)	West of Riverside - E. of Presidential Blvd.	2014	2016	45.0	Engineering, ROW acquisition, utility relocation and construction of grade separation at Riverside Drive and Elimination of signal at Thornberry Drive
Short Term	696	Expand Arterial	TxDOT	SH 71 East Access Project for State Complex	East of AIBA primary entrance to west of SH 130	2015	2017	17.1	Reconstruct existing 4 lane undivided rural principal arterial to a 6 lane divided urban principal arterial with an overpass at FM 973 and median for future freeway mainlanes. (Contingent on Proposition 12 funding.)
Short Term	464	Expand Freeway	TxDOT	SH 71 Bastrop East Freeway Extension, Phase I and II- Hurricane Evacuation Route	West of Colorado River Bridge to .4 miles east of loop 150 East	2012	2017	37.6	Reconstruct existing 4 lane undivided rural principal arterial to extend a 4 lane rural freeway facility. (Contingent on Proposition 12 funding.)
Short Term	463	Expand Freeway	TxDOT	SH 71 Bastrop West Freeway Extension - Hurricane Evacuation Route	West of FM 20 to West of SH 304	2012	2014	36.7	Reconstruct existing 4 lane undivided rural principal arterial to extend a 4 lane rural freeway facility. (Contingent on Proposition 12 funding.)
Short Term	447	New Freeway	TxDOT	SH 130, Segment 5	SH 45 SE - FM 1185	2010	2012	previously let	Construct 4 lane toll freeway with intermittant frontage roads.

Map 22: 2035 Arterial Streets

CAMPO Region

May 24, 2010



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Note: This map may differ slightly from the functional classification map that is used to determine federal funding eligibility.

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

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DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
AUSTIN	TRAVIS	0151-09-138	US 183 (S)	E	OTHER	CTRMA	**$30,000**

PROJECT TYPE: ROADWAY

REV DATE: 07/2010
MPO PROJECT ID: 15
FUNDING CATEGORY: LOCAL
MTP REFERENCE:

LIMITS FROM: BLESSING AVENUE
LIMITS TO: CAMERON ROAD
TIP DESCRIPTION: PREPARATION OF PROGRAMATIC CATEGORICAL EXCLUSION

REMARKS:
BICYCLE/PEDESTRIAN: N/A

Project History:

Total Project Cost Information:		**Cost of Approved Phases:**
Preliminary Engineering:	$30,000	**$30,000**
Right Of Way:	$0	
Construction:	$0	
Construction Engineering:	$0	
Contingencies:	$0	
Indirects:	$0	
Bond Financing:	$0	
Total Project Cost:	**$1,000,000**	

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	**Funding By Category**
LOCAL					$30,000	$30,000
Funding by Share:					$30,000	**$30,000**

AUSTIN	TRAVIS	0700-03-077	SH 71 (W)	E	OTHER	CTRMA	**$5,700,000**

PROJECT TYPE: ROADWAY

REV DATE: 07/2010
MPO PROJECT ID: 16
FUNDING CATEGORY: LOCAL
MTP REFERENCE:

LIMITS FROM: US 290
LIMITS TO: SILVERMINE DRIVE
TIP DESCRIPTION: PREPARATION OF SUPPLEMENTARY ENVIRONMENTAL IMPACT STATEMENT , TRAFFIC AND REVENUE STUDIES AND FINAL ENGINEERING

REMARKS:
BICYCLE/PEDESTRIAN: WITH ULTIMATE PROJECT CONSTRUCTION BICYCLE ACCOMMODATION WILL BE ON WIDE OUTER LANES OR SHOULDERS ON THE ACCESS ROADS AND PEDESTRIANS WILL BE ACCOMMODATED ON THE SIDEWALKS

Project History:

Total Project Cost Information:		**Cost of Approved Phases:**
Preliminary Engineering:	$5,700,000	**$5,700,000**
Right Of Way:	$97,200,000	
Construction:	$42,210,000	
Construction Engineering:	$3,100,000	
Contingencies:	$4,690,000	
Indirects:	$26,700,000	
Bond Financing:	$0	
Total Project Cost:	**$179,600,000**	

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	**Funding By Category**
LOCAL					$5,700,000	$5,700,000
Funding by Share:					$5,700,000	**$5,700,000**

AUSTIN	TRAVIS	1200-06-004	SH 45 (SW)	E	TRAVIS	CTRMA	**$4,200,000**

PROJECT TYPE: ROADWAY

REV DATE: 07/2010
MPO PROJECT ID: 19
FUNDING CATEGORY: LOCAL
MTP REFERENCE:

LIMITS FROM: HAYS COUNTY LINE
LIMITS TO: LOOP 1
TIP DESCRIPTION: PREPARATION OF ENVIRONMENTAL IMPACT STATEMENT, TRAFFIC AND REVENUE STUDIES, FINAL ENGINEERING

REMARKS:
BICYCLE/PEDESTRIAN: 10' WIDE SHARED USE PATH

Project History:

Total Project Cost Information:		**Cost of Approved Phases:**
Preliminary Engineering:	$4,200,000	**$4,200,000**
Right Of Way:	$3,100,000	
Construction:	$45,600,000	
Construction Engineering:	$5,900,000	
Contingencies:	$5,100,000	
Indirects:	$13,600,000	
Bond Financing:	$0	
Total Project Cost:	**$77,500,000**	

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	**Funding By Category**
LOCAL					$4,200,000	$4,200,000
Funding by Share:					$4,200,000	**$4,200,000**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
AUSTIN	TRAVIS	1200-07-001	SH 45 (SW)	E	OTHER	CTRMA	**$700,000**

PROJECT TYPE: ROADWAY

REV DATE: 07/2010
MPO PROJECT ID: 18
FUNDING CATEGORY: LOCAL
MTP REFERENCE:

LIMITS FROM: FM 1626
LIMITS TO: TRAVIS COUNTY LINE

TIP DESCRIPTION: PREPARATION OF ENVIRONMENTAL IMPACT STATEMENT, TRAFFIC AND REVENUE STUDIES, FINAL ENGINEERING

REMARKS:
BICYCLE/PEDESTRIAN: 10' WIDE SHARED USE PATH

Project History:

Total Project Cost Information:

Preliminary Engineering:	$700,000
Right Of Way:	$600,000
Construction:	$1,000,000
Construction Engineering:	$7,500,000
Contingencies:	$800,000
Indirects:	$2,200,000
Bond Financing:	
Total Project Cost:	**$12,800,000**

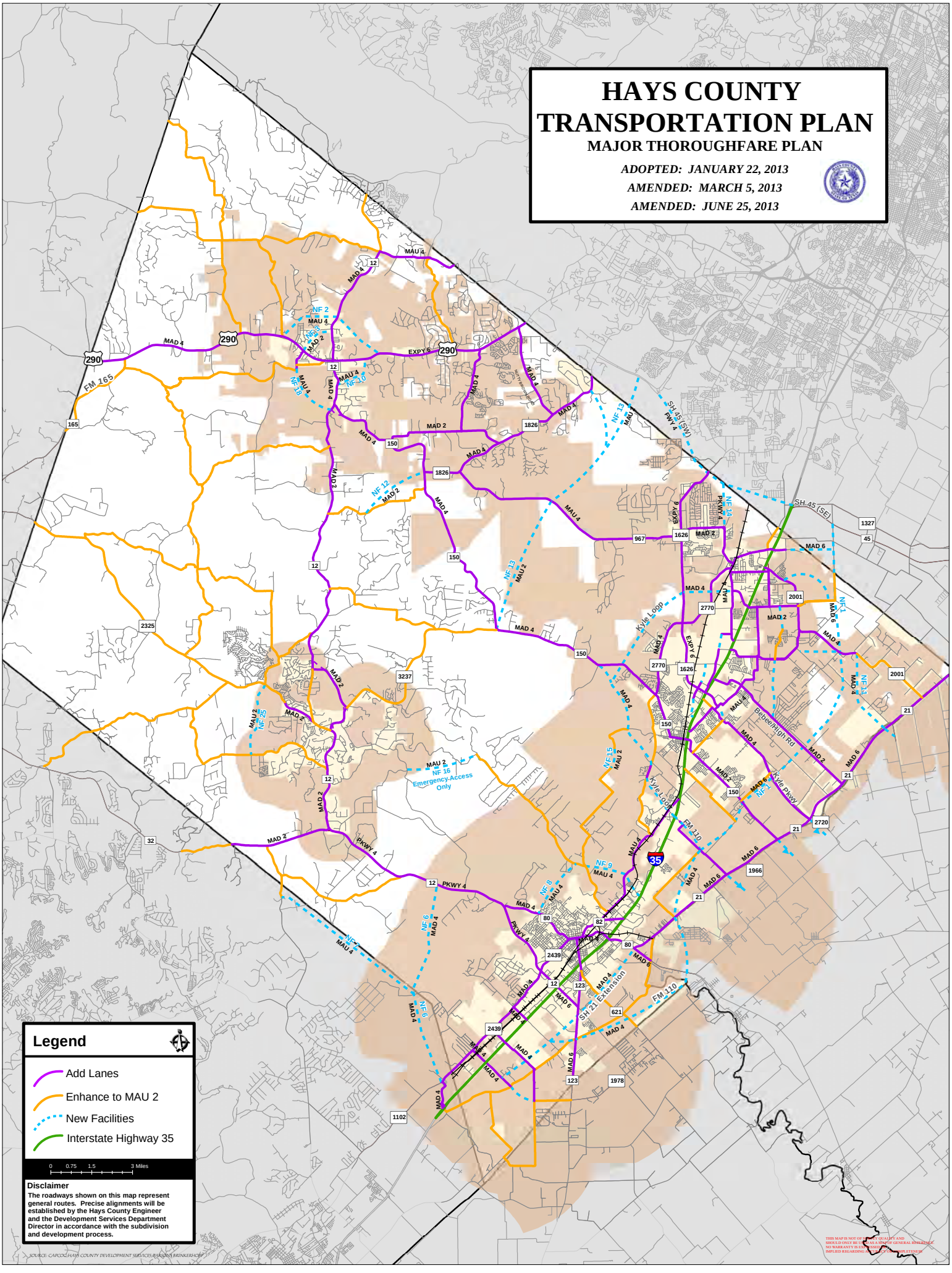
Cost of Approved Phases: **$700,000**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
LOCAL					$700,000	$700,000
Funding by Share:					$700,000	**$700,000**

Table 5-1. HCTP Roadway Projects Matrix

Roadways		Thoroughfare Program		
Roadway Name	Segment	Existing Cross Section	Recommended Cross Section	Recommended Right-of-way (Feet)
STATE ROADWAYS				
IH 35	Travis County Line - Comal County Line	FWY 6	Corridor Study	
US 290 (W)	Blanco County Line - RM 165	MAU 4	MAD 4	200
US 290 (W)	RM 165 - NF 2	MAU 4	MAD 4	200
US 290 (W)	NF 2 - RM 12	MAD 4	MAD 4	200
US 290 (W)	RM 12 - Nutty Brown Rd/Travis County Line	MAD 4	EXPY 6	400
SH 21	Caldwell County Line - CR 159 (Yarrington)	MAU 2	MAD 6	200
SH 21	CR 159 (Yarrington) - SH 80	MAU 2	MAD 6	200
SH 21	SH 80 - Posey Rd	None	MAD 4	200
SH 45 (SW)	Loop 1 - FM 1626 (Travis and Hays counties)	None	FWY 4 Toll	400
SH 45 (SW)	FM 1626 - IH 35 (Hays and Travis counties)	None	TBD	400
SH 80 / Old RR 12	RM 12/Wonder World Dr - Holland St	MAU 4	MAD 4	
SH 80 / Old RR 12	Holland St - Lindsey	MAU 2	MAD 4	
SH 80 / Old RR 12 / Moore St	Lindsey - Hopkins	MAU 3	MAD 4	
SH 80 / E. Hopkins	Moore St - Loop 82	MAU 3	MAD 4	
SH 80 / E. Hopkins	Loop 82 - CM Allen	MAU 4	MAD 4	
SH 80 / E. Hopkins	CM Allen - IH 35	MAD 4	MAD 4	
SH 80	IH 35 - SH 21	MAD 4	MAD 4	
SH 80	SH 21 - Caldwell County Line	MAU 4	MAD 6	200
SH 123	IH 35 - FM 621	MAD 4	MAD 6	
SH 123	FM 621 - Wonder World Dr	MAU 4	MAD 6	
SH 123	Wonder World Dr - Guadalupe County Line	MAU 4	MAD 6	200
Loop 82 / Aquarena Springs Dr	IH 35 - Sessom Dr	MAU 4	MAD 4	
Loop 82 / University Dr	Sessom Dr - Guadalupe St	MAU 4	MAD 4	
Loop 82 / Guadalupe	University Dr - Grove St (One way SB)	MAU 3	MAD 4	
Loop 82 / LBJ	University Dr - Grove St (One way NB)	MAU 3	MAD 4	
Loop 82	Guadalupe St/Grove St - LBJ Dr (One way)	MAU 3	MAD 4	
Loop 82	LBJ Dr - IH 35 (Two way)	MAU 4	MAD 4	
FM 110 (E)	IH 35 (N) - Turnersville Rd Extension (NF 1)	None	FWY 4	220
FM 110 (E)	Turnersville Rd Extension (NF1) - SH 123	None	FWY 4	220
FM 110 (E)	SH 123 - McCarty Ln	None	FWY 4	220
FM 110 (E)	McCarty Ln - IH 35	MAD 4	Existing	Existing


HAYS COUNTY
TRANSPORTATION PLAN
MAJOR THOROUGHFARE PLAN
ADOPTED: JANUARY 22, 2013
AMENDED: MARCH 5, 2013
AMENDED: JUNE 25, 2013
Legend
Add Lanes
Enhance to MAU 2
New Facilities
Interstate Highway 35
0 0.75 1.5 3 Miles
Disclaimer
The roadways shown on this map represent general routes. Precise alignments will be established by the Hays County Engineer and the Development Services Department Director in accordance with the subdivision and development process.
SOURCE: CAPCOG,HAYS COUNTY DEVELOPMENT SERVICES,PARSONS BRINKERHOFF
FM 165
SH 45 (SW)
SH 45 (SE)
Kyle Loop
Bebee/High Rd
Kyle Pkwy
FM 110
SH 21 Extension
NF 16 Emergency Access Only
NF 2
NF 3
NF 4
NF 5
NF 6
NF 7
NF 8
NF 9
NF 10
NF 11
NF 12
NF 13
NF 14
NF 15
NF 18
NF 25
MAU 4
MAD 4
MAD 2
MAD 6
EXPY 6
PKWY 4
FWY 4
290
35

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
AUSTIN	TRAVIS	1200-06-004	SH 45 (SW)	C,E,R	City of Austin	CTRMA/TxDOT	**$100,000,000**

PROJECT TYPE: Roadway
REV DATE:
MPO PROJECT ID:
FUNDING CATEGORY:
MTP REFERENCE:

LIMITS FROM: Loop 1
LIMITS TO: FM 1626
TIP DESCRIPTION: Construction of a 4-lane tolled freeway (Project may be phased)

REMARKS: Map ID 17:
BICYCLE/PEDESTRIAN: Shared used path where feasible

Project History:

Total Project Cost Information:

Preliminary Engineering:	$8,000,000
Right Of Way:	$500,000
Construction:	$74,600,000
Construction Engineering:	$9,300,000
Contingencies:	$7,600,000
Indirects:	
Bond Financing:	
Total Project Cost:	**$100,000,000**

Cost of Approved Phases: **$100,000,000**

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	Funding By Category
2M		$20,300,000				$20,300,000
7		$8,620,000				$8,620,000
12		$3,630,000				$3,630,000
Local				$67,450,000		$67,450,000
Funding by Share:		$32,550,000		$67,450,000		**$100,000,000**

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APPENDIX B
TYPICAL SECTIONS

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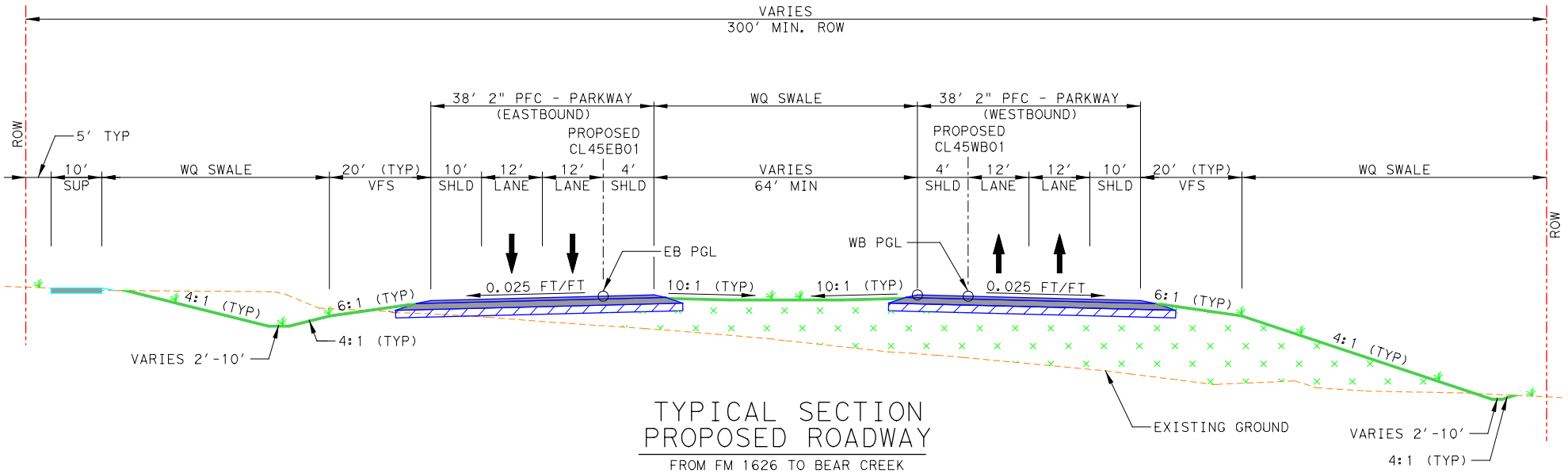
WORK IN PROGRESS



TYPICAL SECTION
PROPOSED ROADWAY
FROM FM 1626 TO BEAR CREEK

LEGEND

WQ = WATER QUALITY

WQ SWALE = GRASSY SWALE

PFC = PERMEABLE FRICTION COURSE PAVEMENT

VFS = VEGETATIVE FILTER STRIPS

SUP = SHARED USE PATH

HAL = HORIZONTAL ALIGNMENT

PGL = PROFILE GRADE LINE

INTERIM REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF

WADE E. STRONG, PE 61841 ON 3/25/2014

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

SH 45 SW

ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 3/25/2014

SH 45SW
PRELIMINARY

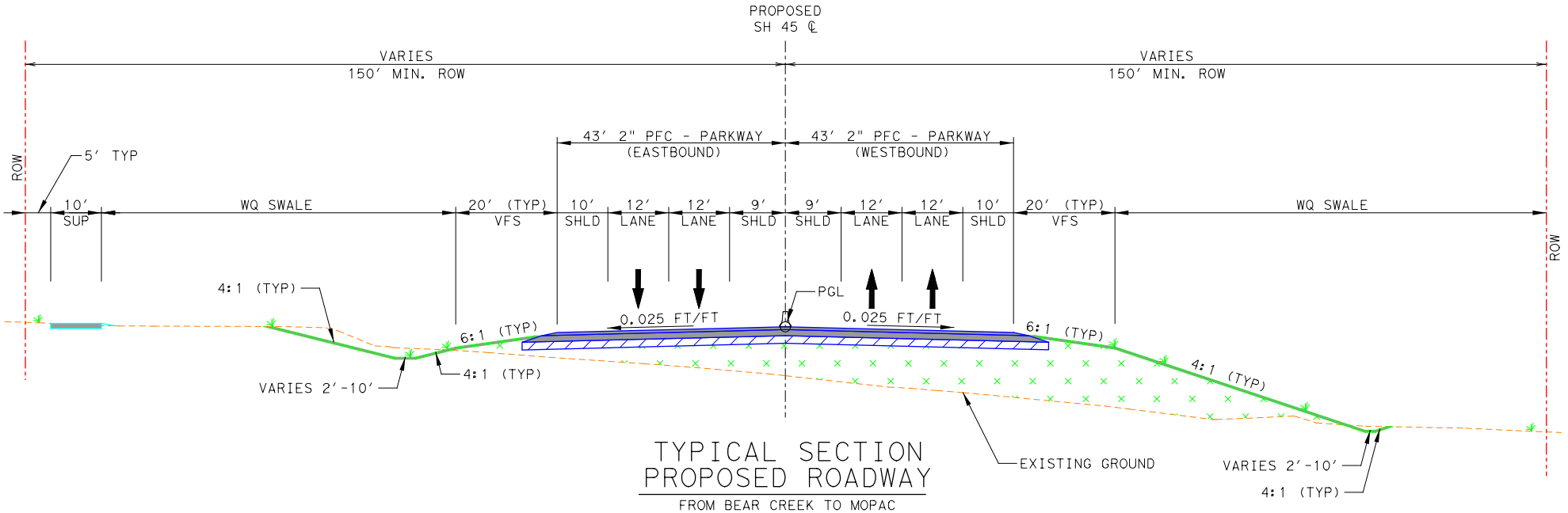
MAINLANE
TYPICAL SECTION

NOT TO SCALE

SHEET 1 OF 2

3/25/2014
P:\8140403\dlv\planSht s\rdwy\Typical Sections\sh45typ_01-31-2014.dgn

WORK IN PROGRESS



TYPICAL SECTION
PROPOSED ROADWAY
FROM BEAR CREEK TO MOPAC

LEGEND

WQ = WATER QUALITY

WQ SWALE = GRASSY SWALE

PFC = PERMEABLE FRICTION COURSE PAVEMENT

VFS = VEGETATIVE FILTER STRIPS

SUP = SHARED USE PATH

HAL = HORIZONTAL ALIGNMENT

PGL = PROFILE GRADE LINE

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SH 45 SW

ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 3/25/2014

SH 45SW
PRELIMINARY

MAINLANE
TYPICAL SECTION

NOT TO SCALE

SHEET 2 OF 2

3/25/2014
P:\8140403\dlv\planSht s\rdwy\Typical Sections\sh45typ_01-31-2014.dgn

APPENDIX C
BUILD ALTERNATIVE DRAFT SCHEMATIC

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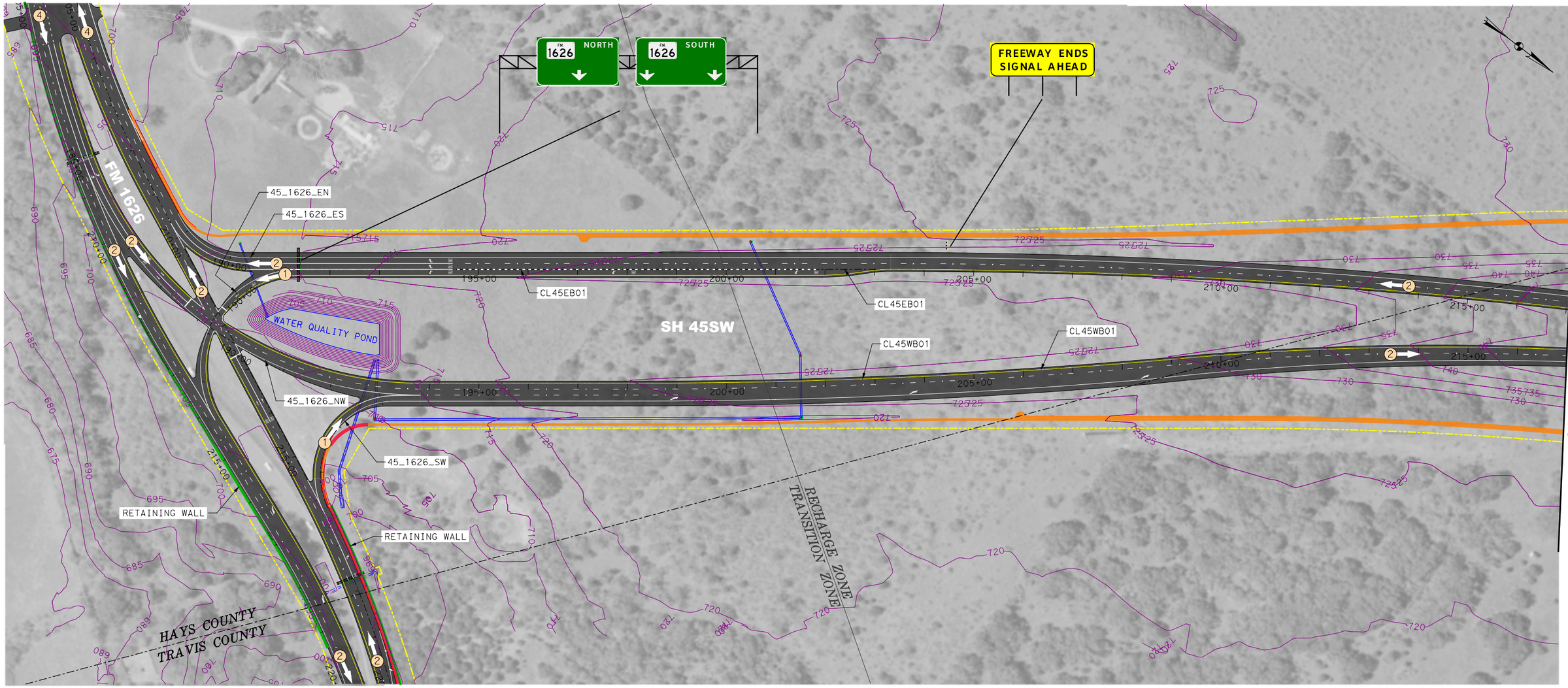
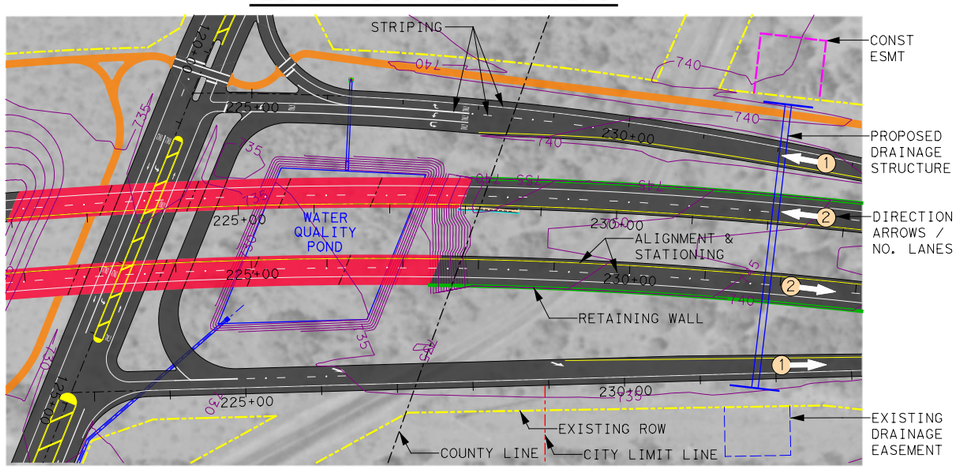


LINE AND SYMBOL LEGEND



0 100' 200'
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
BEGIN TO STA. 217+00

SHEET 1 OF 13

APPENDIX C

10/30/2014
P:\8140403\dlv\planShts\Schematics\EIS PLAN SHEETS\SCHEMATIC SHEET 1.dgn

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STA. 217+00 (CL45WB01)

STA. 248+00 (CL45WB01)

TEXAS 1626 NORTH
LEFT EXIT

FREEWAY ENDS
½ MILE

FM 1626
JCT 1 MILE

Bliss Spillar Rd

CL45EB01

RETAINING WALL

SH 45SW

WATER QUALITY POND

CL45WB01

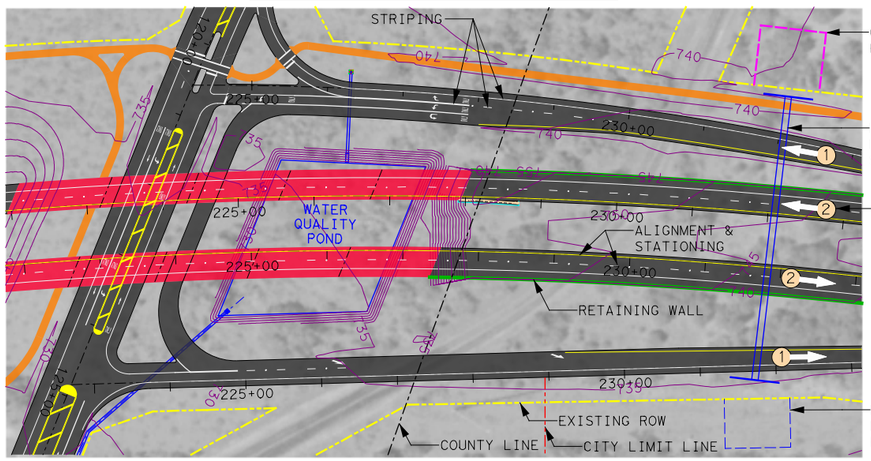
RETAINING WALL

WATER QUALITY POND

WATER QUALITY POND

BLISS SPILLAR RD.

LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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FIRM #587

Texas Department of Transportation®

DATE: 10/30/2014

SH 45SW
PRELIMINARY SCHEMATIC DESIGN

SH 45SW
STA. 217+00 TO STA. 248+00

SH 45SW ENVIRONMENTAL STUDY

SHEET 2 OF 13 APPENDIX C

10/30/2014
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STA. 248+00 (CL45WB01)

STA. 278+00 (CL45WB01)

Bliss Spillar Rd
EXIT ½ MILE

SH 45SW

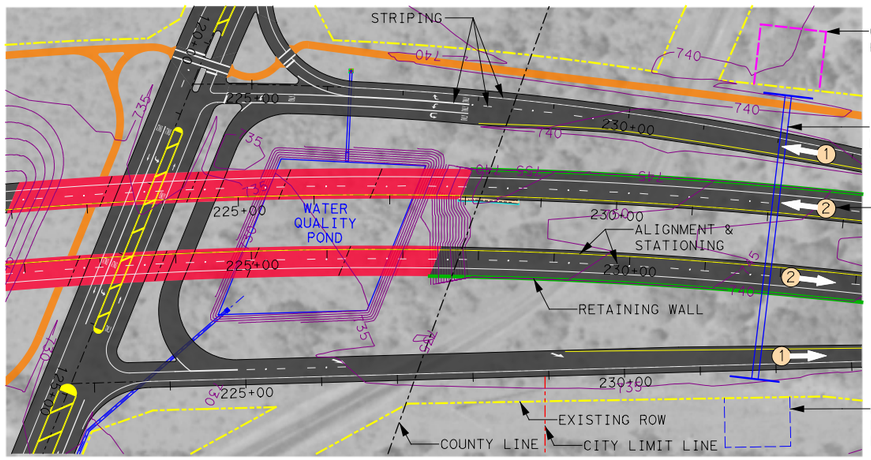
CL45EB01

CL45WB01

TOLL ROAD
TxTag
PAY BY Mail

TOLL ROAD
TxTag
PAY BY Mail

LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 248+00 TO STA. 278+00

SHEET 3 OF 13

APPENDIX C

10/30/2014
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STA. 278+00 (CL45WB01)

STA. 309+00 (CL45_01)

TOLL ROAD

PAY BY Mail

TOLL ROAD

PAY BY Mail

LOOP 1 SOUTH

EXIT 1 MILE

EXIT ONLY

RETAINING WALL

CL45_01

SH 45SW

RETAINING WALL

F110 (Jubilee Cave)

F64

F65

F62a

WQP

BEAR CREEK

WATER QUALITY POND

FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT

280+00

285+00

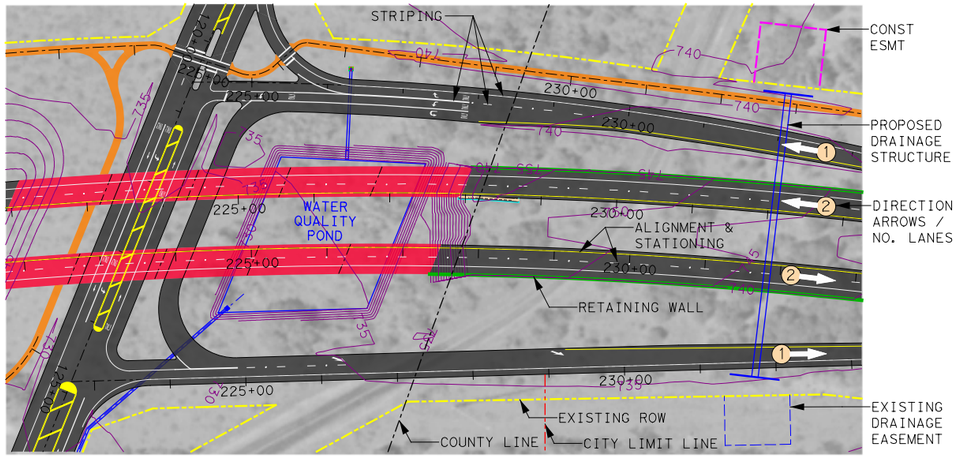
290+00

295+00

300+00

305+00

LINE AND SYMBOL LEGEND



0 100′ 200′

SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW

ENVIRONMENTAL STUDY

DATE: 1/9/2015

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 278+00 TO STA. 309+00

1/9/2015
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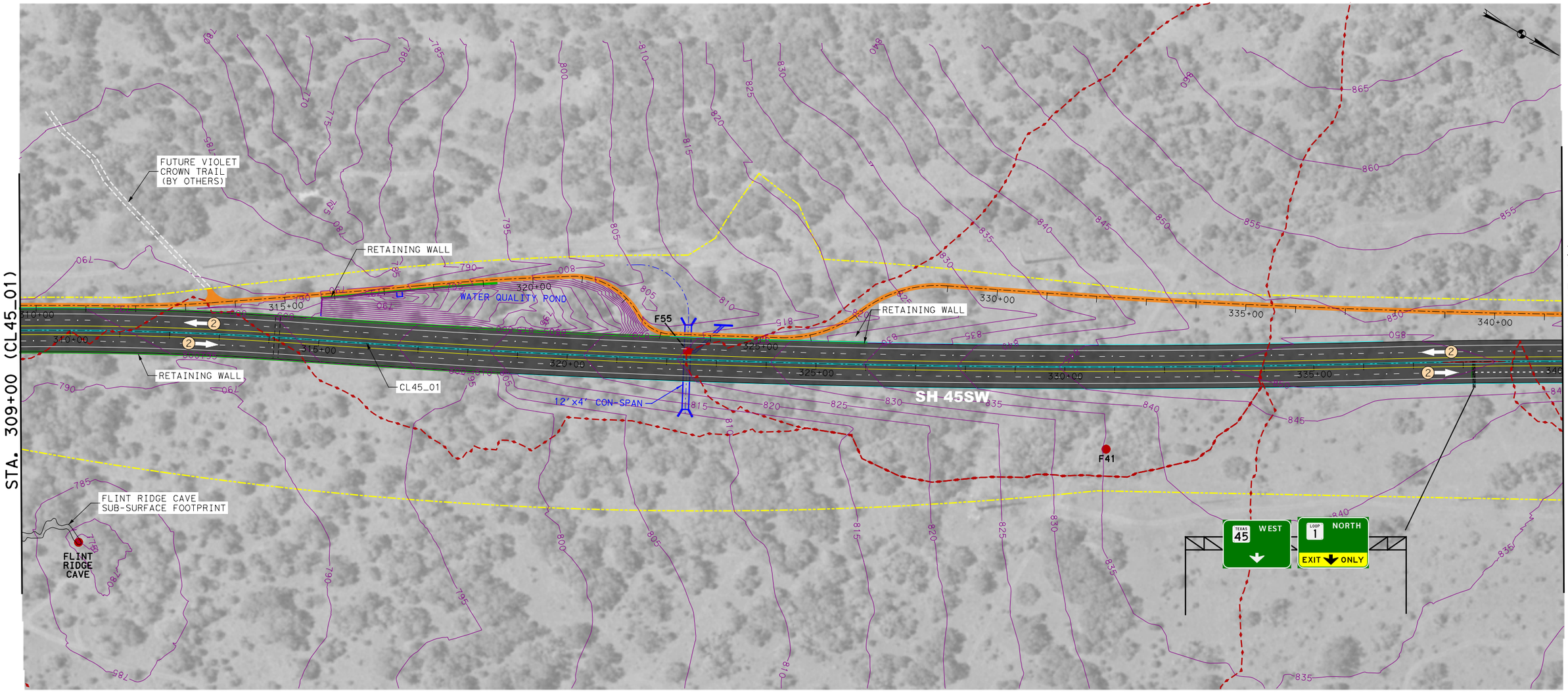
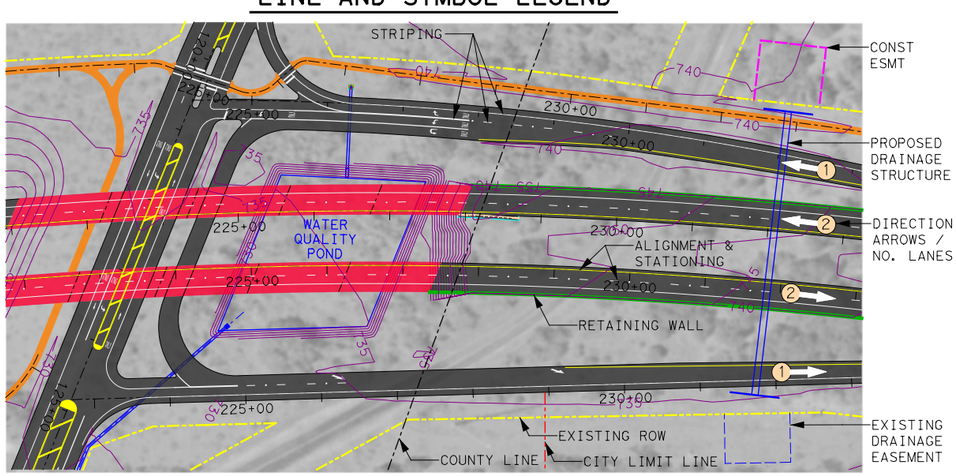


LINE AND SYMBOL LEGEND



0 100' 200'
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 1/9/2015

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 309+00 TO STA. 340+00

SHEET 5 OF 13

APPENDIX C

1/9/2015
P:\8140403\dlv\planShts\Schematics\EIS PLAN SHEETS\SCHEMATIC SHEET 5.dgn

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STA. 340+00 (CL45_01)

SH 45SW

WQP

F23
(Hat Sink)

CL45_01

RETAINING WALL

F29d
F29b
F29o

F16

F18
(Cow Pattie Cave)

WATER QUALITY POND

AUSTIN CITY LIMITS

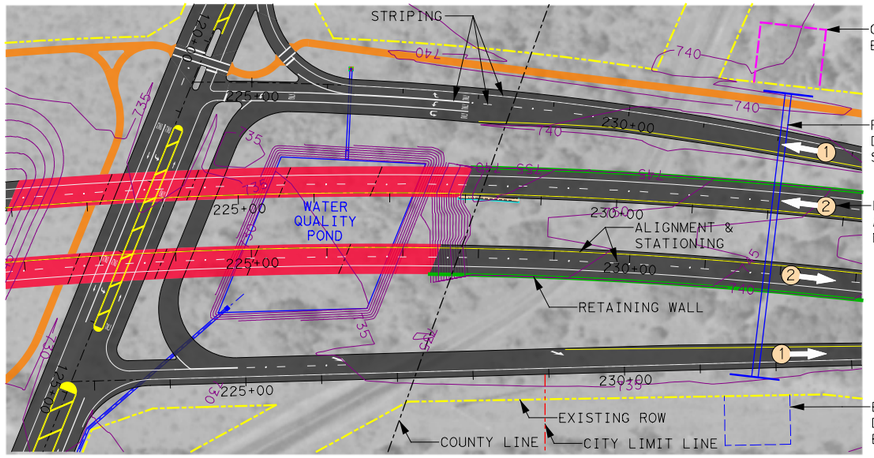
DANZ CREEK SPLIT

TEXAS 45 WEST

LOOP 1 NORTH
EXIT ONLY

STA. 371+00 (CL45_01)

LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW
ENVIRONMENTAL STUDY

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 340+00 TO STA. 371+00

SHEET 6 OF 13

APPENDIX C

10/30/2014
P:\81404403\div\planSht\Schematics\EIS PLAN SHEETS\SCHEMATIC SHEET 6.dgn

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STA. 371+00 (CL45_01)

STA. 1164+00 (LP1SB)

ARCHELEA BLVD.

DANZ CREEK SPLIT

AUSTIN CITY LIMITS

LP1NB_01

CL45EB04

CL45EB02

RETAINING WALL

F157a
(SH45 Cave)

F157b

SH 45

F161

CL45_01

CL45WB02

LP1SB

TRAILHEAD PARKING
UNDER BRIDGE

SH 45SW

45_LP1_WN

LP1NB_01

WATER
QUALITY
POND

FUTURE VIOLET
CROWN TRAIL
(BY OTHERS)

SL1 (MOPAC)

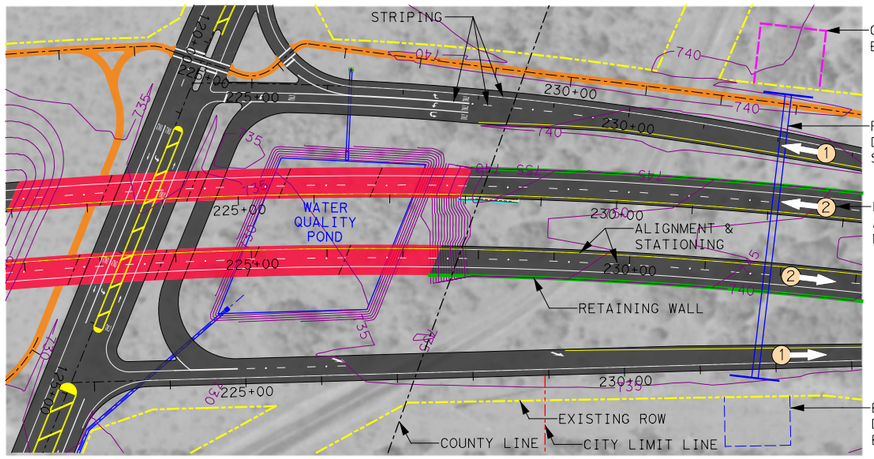
AUSTIN CITY LIMITS

DANZ CREEK

EAST
EXIT ONLY

NORTH

LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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FIRM #587

Texas Department of Transportation®

DATE: 1/9/2015

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 371+00 TO STA. 1164+00

1/9/2015
P:\8140403\div\planSht s\Schematics\EIS PLAN SHEETS\SCHEMATIC SHEET 7.dgn

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STA. 1164+00 (LP1SB)

DANZ CREEK

LP1NB_01

LP1SB

SH 45

F163

ESCARPMENT BLVD.

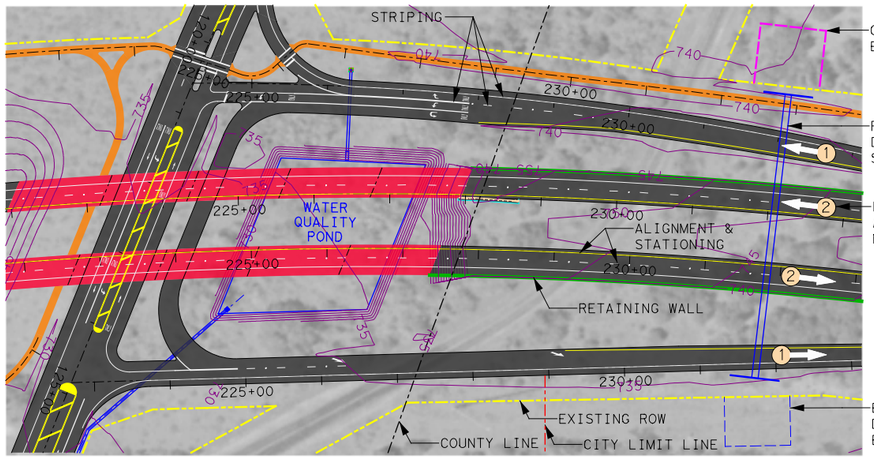
2600'±

45 EAST LEFT EXIT

45 EAST EXIT 1 MILE LEFT EXIT

405+00 410+00 415+00 420+00 1165+00 1170+00 1175+00

LINE AND SYMBOL LEGEND



0 100' 200'
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 1/9/2015

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 1164+00 TO END

1/9/2015
P:\81404003\dlv\planSht\Schematics\EIS PLAN SHEETS\SCHEMATIC SHEET 8.dgn

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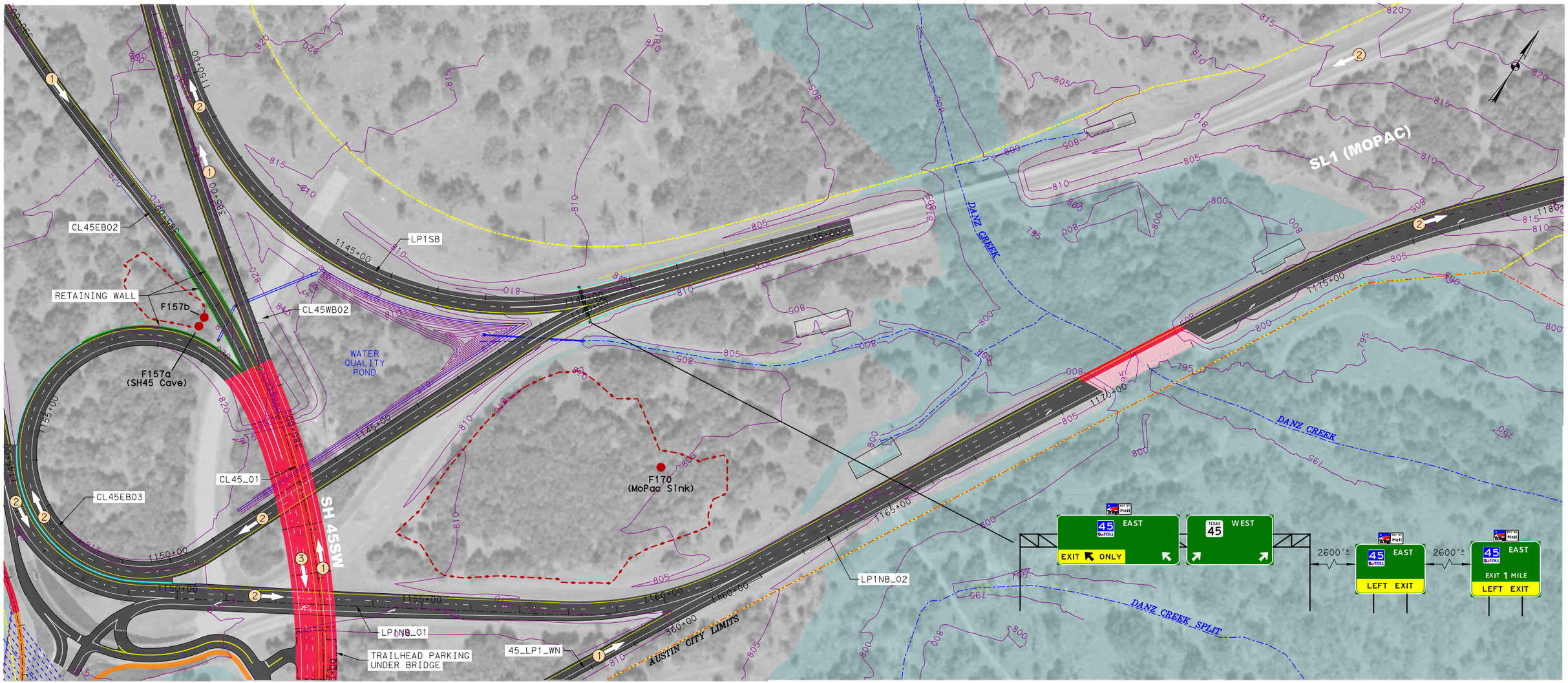
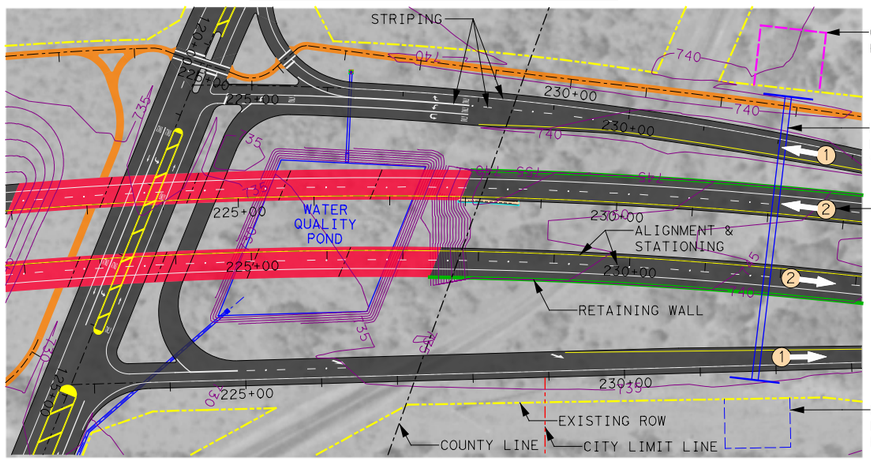


LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW
ENVIRONMENTAL STUDY

DATE: 1/9/2015

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SL1 (MOPAC)
BEGIN TO END

SHEET 9 OF 13 APPENDIX C

1/9/2015
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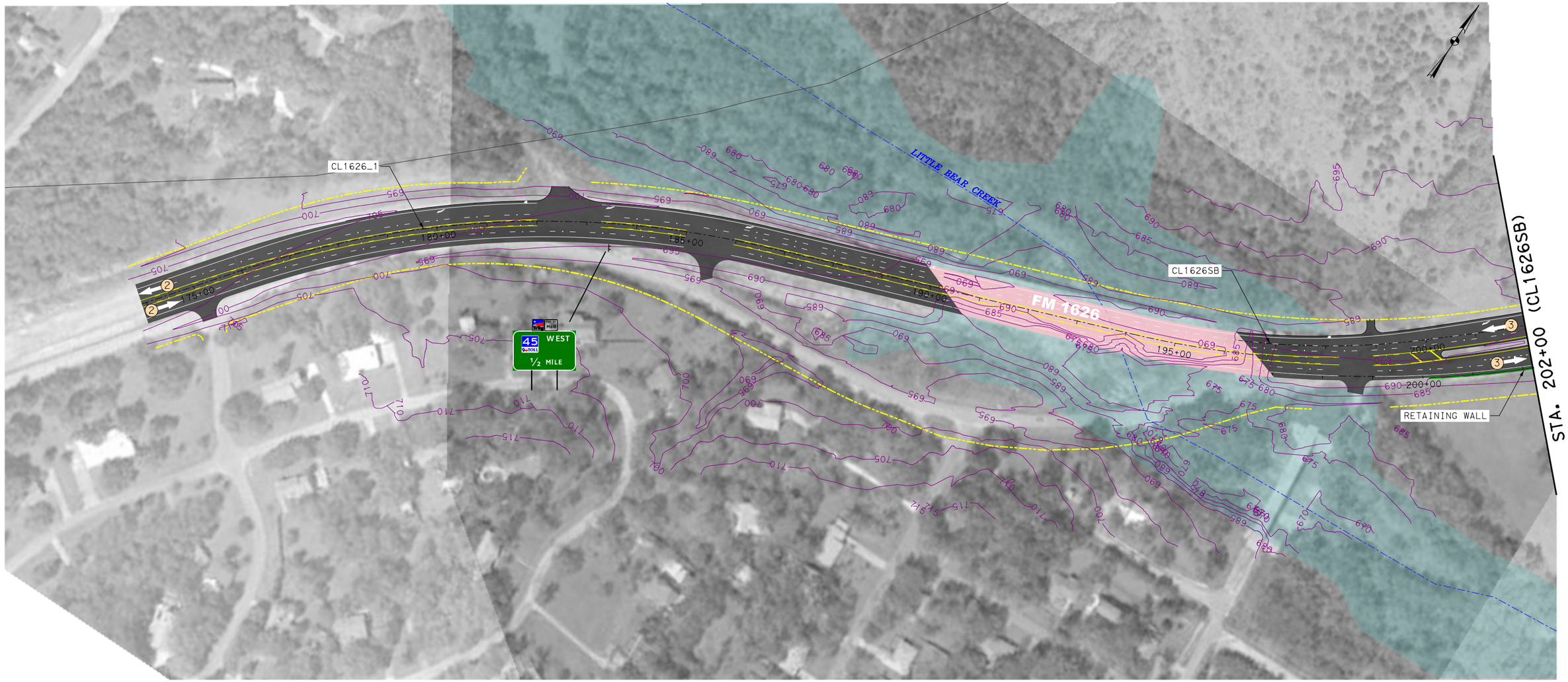
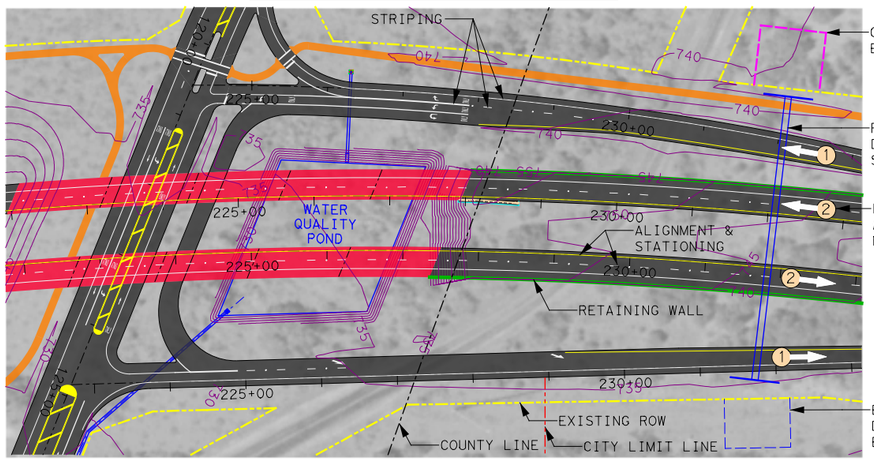


LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

FM 1626
BEGIN TO STA. 202+00

10/30/2014
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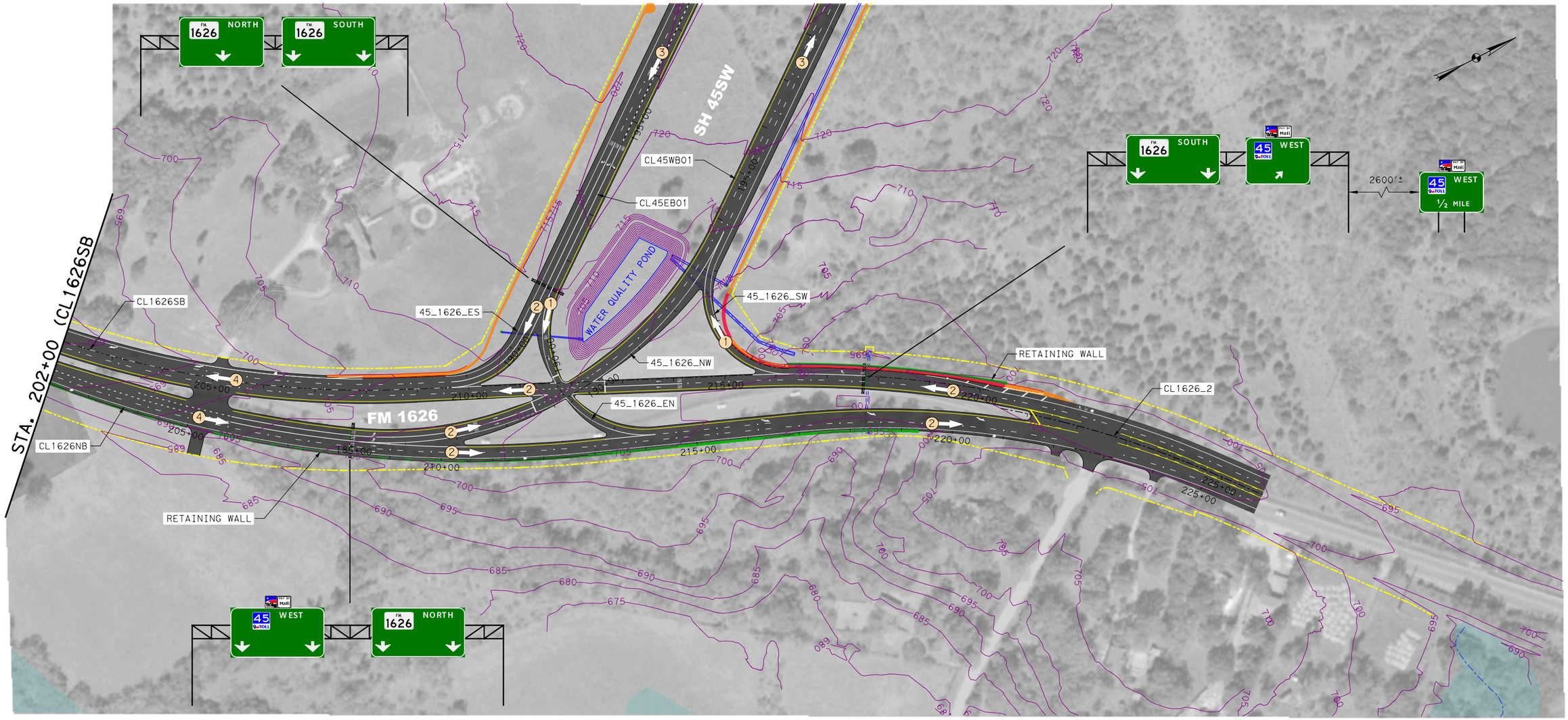
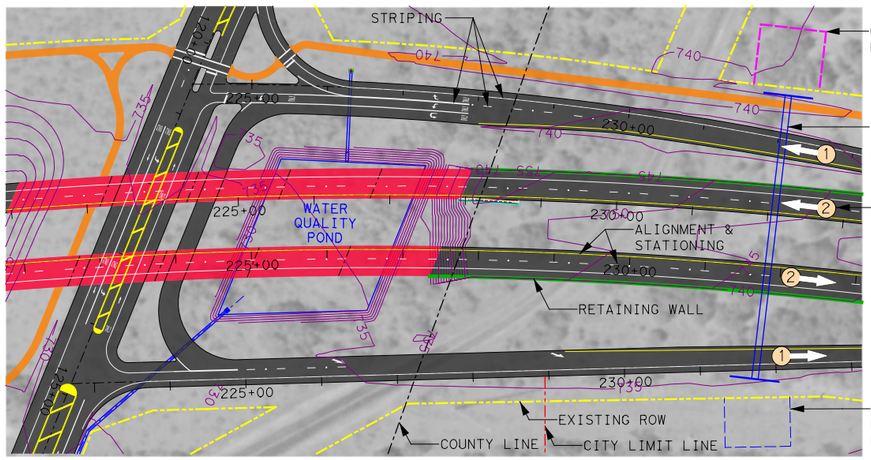


LINE AND SYMBOL LEGEND



0 100' 200'
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

INTERIM REVIEW

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

FM 1626
STA. 202+00 TO END

SHEET 11 OF 13 APPENDIX C

10/30/2014
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BLISS SPILLAR ROAD

100+00

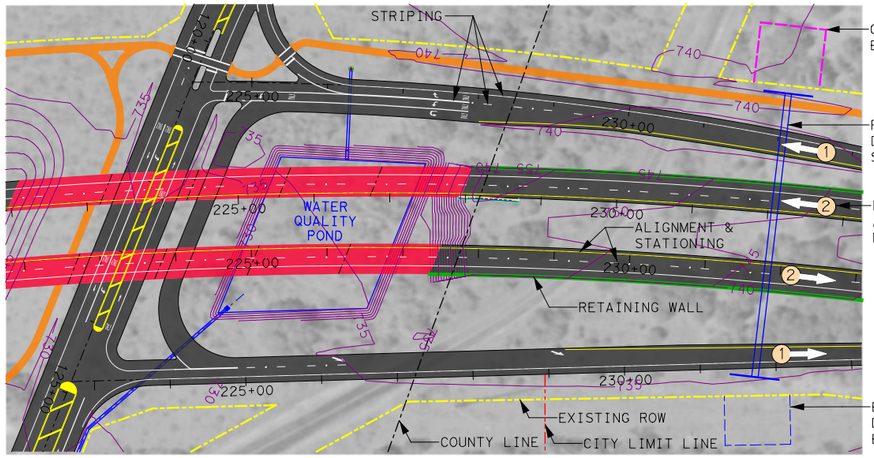
105+00

115+00

STA. 115+00 (CLBLISPIL)

CLBLISPIL

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE

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SH 45SW

ENVIRONMENTAL STUDY

DATE: 10/30/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

BLISS SPILLAR ROAD
BEGIN TO STA. 115+00

10/30/2014
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STA. 115+00 (CLBLISPIL)

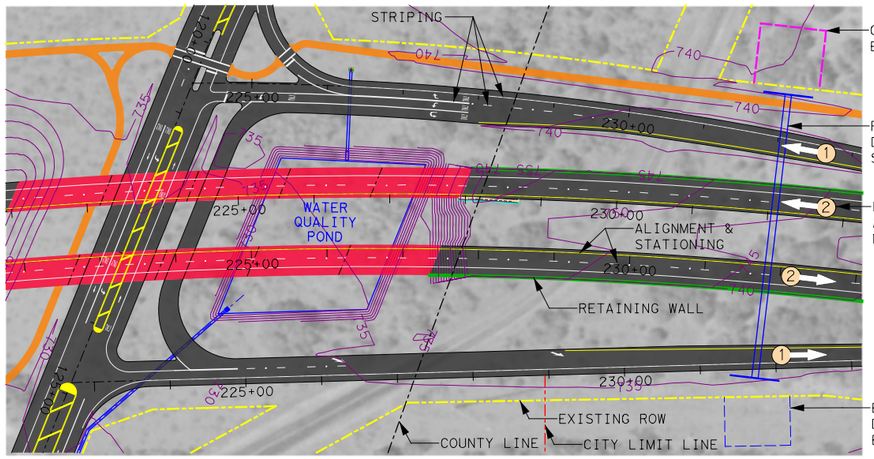
CLBLISPIL

BLISS SPILLAR ROAD

SH 45SW

WATER QUALITY POND

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
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Texas Department of Transportation®

DATE: 10/30/2014

SH 45SW PRELIMINARY SCHEMATIC DESIGN

BLISS SPILLAR ROAD STA. 115+00 TO END

SH 45 SW
ENVIRONMENTAL STUDY

SHEET 13 OF 13

APPENDIX C

10/30/2014
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APPENDIX D
INDIRECT IMPACTS TECHNICAL REPORT

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State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm to Market (FM) 1626

Travis and Hays Counties, Texas

Indirect Impacts Technical Report

Prepared by:

Texas Department of Transportation

CSJ: 1200-06-004 & 1200-07-001

January 2015

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1.0 INTRODUCTION

This technical report summarizes the detailed analysis conducted to assess potential indirect impacts associated with the State Highway 45 Southwest (SH 45SW) project. It provides a discussion of guidance utilized, scoping, goals and trends, the potential for impacts to sensitive resources, impact-causing activities, analysis of potential substantial indirect effects, minimization and mitigation opportunities, and a summary of resources to be carried forward to cumulative impacts analysis. This analysis aims to address the degree to which indirect impacts could occur in the area surrounding the project and to what degree sensitive resources could be affected as a result.

2.0 GUIDANCE

This section was developed using the Texas Department of Transportation's (TxDOT) September 2010 *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*, which is based on the 2002 National Cooperative Highway Research Program (NCHRP) Report entitled *NCHRP Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (NCHRP 2002). Other sources of guidance include the NCHRP Project 25-25, Task 22 report entitled *Forecasting Indirect Land Use Effects of Transportation Projects* (NCHRP 2007). This section was also developed using AASHTO's *Practitioner's Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA* (April 2011).

The following discussion generally follows TxDOT's September 2010 *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses*. It incorporates information from March 2014 updates to TxDOT's *Cumulative Impact Analysis* guidance which emphasizes a focus on the most sensitive resources. Together, these documents are hereafter referred to as "TxDOT ICI guidance." TxDOT's 2010 guidance utilized a seven-step process as its framework, but this technical report presents a fusion of the seven steps along with the four key steps for indirect impact analysis in the 2011 AASHTO Practitioners Handbook. The AASHTO publication highlighted four key tasks:

1) Assess the Potential for Increased Accessibility

2) Assess the Potential for Induced Growth

3) Assess the Potential for Impacts on Sensitive Resources

4) Assess the Potential Minimization and Mitigation Measures

This analysis utilizes elements of both TxDOT and AASHTO guidance documents and contains the following sections which address the key tasks articulated by AASHTO:

- Scoping

- Resources Analyzed for Indirect Impacts
- Goals and Trends
- Impact-Causing Activities
- Potentially Substantial Indirect Impacts
    - Access Alteration
    - Effects Resulting from Induced Growth
- Minimization and Mitigation

The following indirect impact analysis is based on several central definitions. In addition to direct effects, major transportation projects may also have indirect effects on land use and the environment. As defined by the Council on Environmental Quality (CEQ), indirect effects are "caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR §1508.8). It should be noted that guidance documents use different terms, including "indirect effects" (AASHTO guidance) and "indirect impacts" (TxDOT guidance). For the purposes of this analysis, both terms are used and the meanings are the same.

NCHRP Report 466 (2002) identifies three broad categories of indirect effects:

1. **Encroachment-alteration effects**: These effects may result from changes in ecosystems, natural processes, or socioeconomic conditions that are caused by the proposed action but occur later in time or farther removed in distance. One example of this type of effect would be a change in habitat or flow regime downstream resulting from installation of a new culvert.

2. **Project-influenced development effects**: Sometimes called induced growth or the "land use effect." For transportation projects, induced growth effects are most often related to changes in accessibility to an area, which in turn affects the area's attractiveness for development. Indirect impacts associated with induced development are also similar to direct impacts but would occur in association with future land use development undertaken by others over the development horizon within a larger study area beyond the direct footprint of the proposed project.

3. **Effects related to project-influenced development**: These are impacts to the natural or human environment that may result from project-influenced changes in land use.

Probability is important in providing a distinction between direct and indirect effects because direct effects are generally inevitable, while indirect effects are merely probable. According to NCHRP Report 466 (2002), the term “reasonably foreseeable” means that effects are “sufficiently likely to occur that a person of ordinary prudence would take them into account in making a decision;” such effects are probable, not just possible. Further, “effects that can be classified as possible but not probable may be excluded from consideration” (NCHRP, 2002).

According to the Texas Department of Transportation’s (TxDOT's) Guidance on Indirect and Cumulative Impacts Analysis (2010), "[t]he common definition of ‘substantial’ is ‘of ample or considerable amount, quantity, size, etc.’ Substantial impacts are those that are noteworthy.” TxDOT rules define the term “significant” as it has been interpreted under NEPA and its related regulations. See 43 TAC 2.5 (26). That interpretation includes the definition used in 40 CFR 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.

For the current analysis, encroachment-alteration effects were discussed in the direct impacts sections of the Final Environmental Impact Statement (FEIS), per current TxDOT direction. Encroachment-alteration impacts are summarized in **Table 4-2** below. Project-influenced development effects are discussed in the access alteration section (**Section 7.2**). Effects related to project-influenced development are discussed within the section on indirect effects potentially resulting from induced growth (**Section 7.3**). Planning judgment, collaborative judgment, and cartographic techniques were employed in this analysis.

The AASHTO guidance recommends a focus on the potential impacts to sensitive resources, so **Section 7.3** includes detailed technical analysis of sensitive resources. Sensitive resources are characterized as “At Risk” and include sensitive species and habitats, valued environmental components, relative uniqueness, recovery time, unusual landscape features, and vulnerable elements of the population, according to TxDOT guidance. Potential minimization and mitigation measures are a focus of the TxDOT guidance and the AASHTO guidance and are discussed in **Section 8.0** that follows.

As noted in the NCHRP guidance, “[i]ndirect effects can be linked to direct effects in a causal chain” (NCHRP 2002). This analysis operates under the assumption that a proximate

cause-effect relationship with the proposed project must be present in order for an indirect effect to occur. In cases where the proposed project would potentially contribute—but not be causally linked—to a potential effect, the contribution of the proposed project to this potential effect when added to other past, present, and reasonably foreseeable future actions by others is considered further in the ***Cumulative Effects Technical Report*** in **Appendix I**.

3.0 SCOPING

3.1 Summary of Scoping Activities Completed

Scoping is a process used to determine the extent of the analysis needed and to define the study area. The scoping process has two overall goals: (1) determining the level of effort and approach needed to complete the analysis, and (2) determining the location and extent of the indirect impact study area. Scoping has been considered by TxDOT and Central Texas Regional Mobility Authority (CTRMA) since the earliest stages of project development for SH 45SW, in addition to public and agency scoping meetings. Scoping for the project, including indirect impacts, was conducted via the following methods:

- Regular coordination among the study team and the project's sponsors and stakeholders;
- Agency stakeholder meetings;
- Public involvement through public information meetings; and
- Distribution of a questionnaire to local agencies and organizations.

The public and stakeholder meetings were used to introduce the project to the general public and to solicit comments and input on the project as it progressed. Meetings with neighborhood associations, environmental groups, and other stakeholders have also been ongoing throughout the project.

Table 3-1 shows the public meetings and workshops held to date:

Table 3-1: Public Stakeholder Meetings

Meeting Type	Date
Public Scoping	10/8/2013
Environmental Listening Workshop	11/14/2013
Public Scoping	12/10/2013
Public Hearing	7/29/2014

Source: CP&Y 2014.

Technical Work Group meetings were held on a variety of topics including water quality, engineering and Best Management Practices (BMPs), and karst and biological issues. Attendees from local, state, and federal agencies and jurisdictions were present at these meetings to provide input and voice concerns. Technical Work Group meetings were held throughout the EIS process. The following Technical Work Group and agency meetings have occurred (**Table 3-2**):

Table 3-2: Agency Stakeholder Meetings

Meeting Type	Date
Agency Scoping	7/31/2013
Technical Work Group (Water Quality, General Environmental Issues)	10/9/2013
Engineering Work Group	10/24/2013
Engineering Work Group	11/20/2013
Technical Work Group (Water Quality, General Environmental Issues)	12/5/2013
Agency Scoping	12/10/2013
Biology and Karst Work Group	1/22/2014
Technical Work Group (Water Quality, General Environmental Issues)	5/28/2014
Technical Work Group (Water Quality, General Environmental Issues)	7/25/2014
Technical Work Group (Water Quality, General Environmental Issues)	9/25/2014

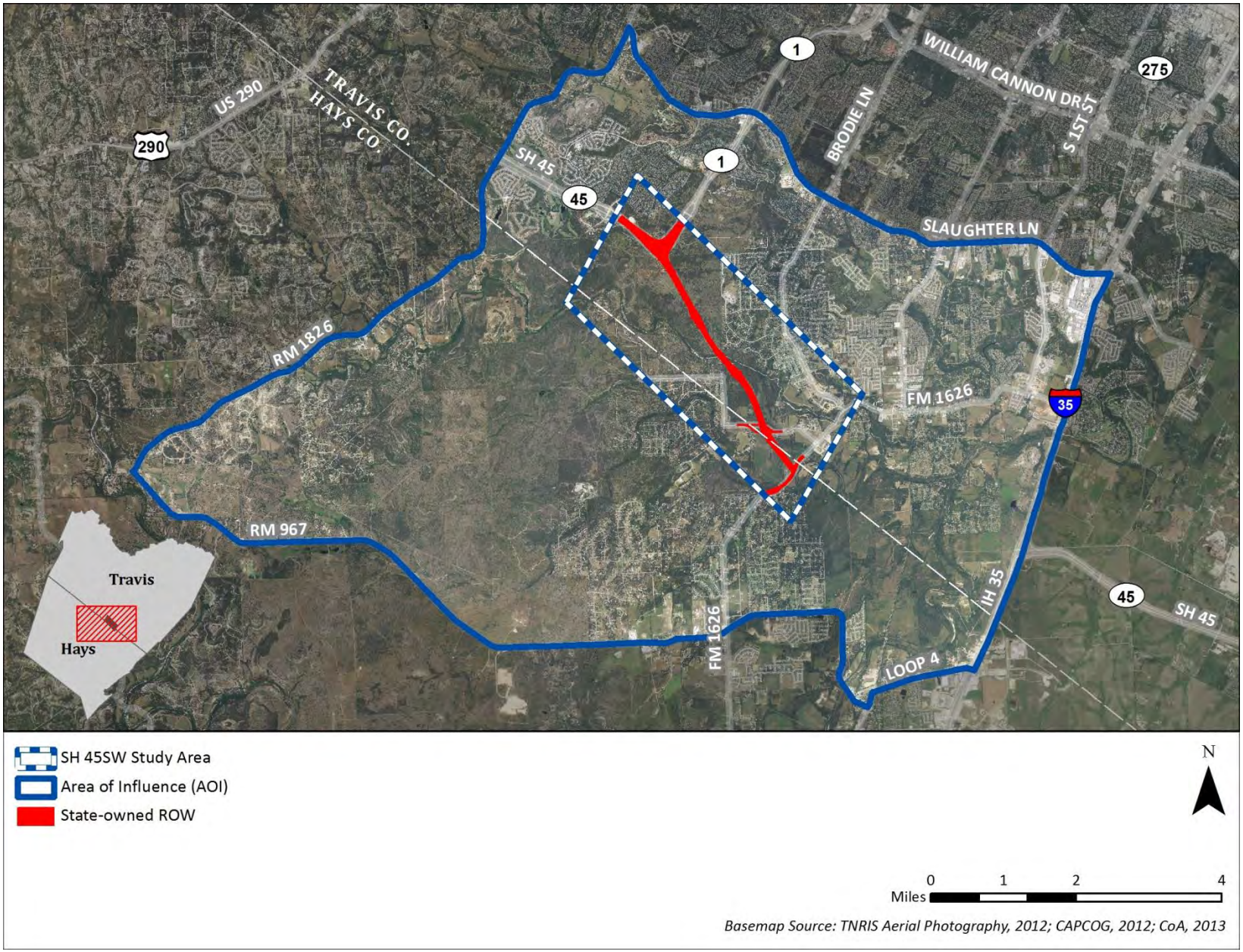
Source: CP&Y 2014.

These meetings have documented that, from an agency standpoint, the key resources for investigation of potential indirect impacts are associated with water quality and quantity, including surface and groundwater, karst features, and aquifer-dependent species associated with the Barton Springs portion of the Edwards Aquifer. Past studies have been consulted and extensive data collection has taken place to ascertain connections between the proposed project and currently planned development, in addition to the potential for induced development. These resources and issues are primary considerations in this Technical Report.

3.2 Description of the SH 45SW Area of Influence

NCHRP Report 466 suggests that because indirect effects associated with a project can occur at a distance in time or space from the project itself, the study area for determining indirect effects is often broader than the study area associated with direct effects analysis. In order to distinguish it from the study areas considered for the analysis of direct effects of the project, the study area for the indirect effects analysis will be referred to as the Area of Influence (AOI). The physical boundaries of the AOI are bordered by Slaughter Road to the north, RM 1826 to the west, RM 967 to the south, and IH 35 to the east, an area totaling approximately 41,674 acres. This AOI was selected based on the following factors: a determination of those neighborhoods and areas best served by the proposed roadway improvements; a determination of those areas most likely to be potentially opened for development following construction of the roadway; discussions with local planning experts in the municipalities and counties within the AOI; and a determination of natural resources that could be potentially indirectly impacted. The AOI includes some or all of the cities of Austin, Buda, the community of Hays, the Village of San Leanna, and unincorporated parts of Travis and Hays counties. Additional entities were consulted beyond the boundaries of the AOI because they are considered stakeholders in the proposed project. These entities included the cities of Dripping Springs, Mountain City, local transportation planning agencies, and water supply corporations. See **Section 7.3.3** for more information. During the investigation process, questionnaires were submitted to these entities and none of those interviewed had questions or raised concerns about the proposed boundaries of the AOI. See **Figure 3-1** for a map of the AOI.

Figure 3-1: Area of Influence



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4.0 RESOURCES ANALYZED FOR INDIRECT IMPACTS

All evaluated resources were analyzed with respect to Encroachment Alteration effects in the main body of the FEIS document, following the Direct Effects discussion. The brief decision tree summarized in **Table 4-1** confirms the need to conduct induced development analysis.

Table 4-1: Risk Assessment Screening Tool – Induced Development

Does the Purpose and Need include economic development, or is the project proposed to serve a specific development?	No
Are economic development or new opportunities for growth/development cited as benefits of the project?	No
Is land in the project area available for development and/or redevelopment?	Yes
Does the project add capacity?	Yes
Is the project located in a rural area outside of the MPO boundary?	No
Does the project substantially increase access or mobility in the project area?	Yes
Is the project area experiencing population and/or economic growth?	Yes

Table 4-2 includes a description of resources analyzed for potential indirect impacts from induced development, including consideration of encroachment issues. Resources that have been investigated in more detail for potential indirect impacts are identified in the table with a "yes" in the final column. Resources that either have no direct effects or no substantial potential to result in indirect effects, and that are therefore not analyzed in detail in this Technical Report are indicated with "no."

Through Planner Questionnaires and Cartographic Analysis, this analysis shows that some land is available for induced development in the AOI, but the degree to which that development is specifically attributable to construction of the proposed project is limited for several reasons. There is a high growth rate in the area in general; there is limited development potential nearby due to water quality protection lands (WQPLs) and other undevelopable lands; the area is also surrounded by developments that are already underway; and the roadway may serve regional traffic to a greater degree than it serves local traffic or spurs local development. The connection between the construction of this roadway and development is most apparent for developable land at the access points along FM 1626, Bliss Spillar Road, and MoPac.

TxDOT (2014) and AASHTO (2011) indirect impact assessment guidance require consideration of potential impacts to sensitive resources. According to TxDOT's guidance, indirect impact analysis involves considering in particular several features that may occur within the AOI as a means to

assessing indirect impacts. These features may highlight sensitive resources that have a high likelihood of being adversely affected as a result of indirect impacts, therefore meriting particular attention:

- **Sensitive Species and Habitats** generally refers to ecologically valuable species and habitat, and/or those that are vulnerable to impacts. Sensitive Species and Habitats include state and Federally-listed threatened and endangered species and their habitats.
- **Valued Environmental Components** are characteristics or attributes of the environment that society seeks to use, protect, or enhance such as a protected park or a conservation easement.
- **Relative Uniqueness, Recovery Time, and Unusual Landscape Features** are concepts intended to aid the analyst in identifying a resource that may be in decline in the AOI. Relative uniqueness refers to how many comparable examples of the element exist at different levels of scale. Recovery time refers to how long it would take to replace the landscape element if it were disturbed or destroyed.
- **Vulnerable Elements of the Population** may include the elderly, children, persons with disabilities, minority groups, or low-income groups. These populations may be more susceptible to environmental conditions, more dependent on non-vehicular forms of transportation, or underrepresented in the decision-making process.

Any of these factors or a combination of these factors can exist in the AOI such that certain resources warrant detailed analysis. Rather than try to distinguish one type of sensitivity from another, for this analysis, sensitive resources are characterized as “At Risk” in **Table 4-2** and described with respect to the aspects that characterize them as sensitive.

Table 4-2: Resources Analyzed for Indirect Impacts

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Historic Resources	Based on information available, there are no historic resources in the study area and therefore there would be no impacts to historic above-ground resources. The Ransom and Sarah Williams Farmstead is a historic-era archeological site with foundations and miscellaneous archeological artifacts. There do not appear to be any above-ground resources remaining associated with the Ransom and Sarah Williams period of significance. This analysis included investigation of an Area of Potential Effect that is considered appropriate for assessing indirect impacts to historic sites, according to the Programmatic Agreement between TxDOT and THC.	No NRHP-eligible historic resources or SALs are known in the project vicinity; therefore, encroachment-alteration impacts are not anticipated.	Resources that are 50 years of age are potentially historic. NRHP eligible historic resources are protected by State and Federal regulations for publicly funded projects.	No
Archeological Resources	The only direct impacts to archeological resources within the SH 45SW right-of-way (ROW) would occur at the portions of prehistoric and historic site 41TV1051 (Ransom and Sarah Williams Farmstead) and prehistoric site 41TV1424 (not NRHP or SAL eligible) that overlap with the SH 45SW ROW. This analysis included investigation of an Area of Potential Effect that is considered appropriate for assessing indirect impacts to archeological sites, according to the Programmatic Agreement between TxDOT and THC.	Eight archeological sites are adjacent to the ROW; however, no additional acquisition of construction easements or ROW on these properties is anticipated. These sites have also either not been recommended for SAL/NHRP designation or have been declared ineligible for SAL/NHRP designation. Therefore, encroachment-alteration impacts are not anticipated.	The historic component at 41TV1051 associated with the Ransom and Sarah Williams Farmstead was determined eligible for inclusion to the NRHP and SAL designation. It was determined that the 2009 mitigation of the farmstead component exhausted its research potential and the proposed construction could proceed without additional investigations.	No
Community Resources	No displacements of community facilities would occur.	No encroachment-alteration impacts are anticipated.	No	No
Businesses	No displacements of businesses would occur.	No encroachment-alteration impacts are anticipated.	No	No
Residences	No residential displacements or relocations would occur.	No encroachment-alteration impacts are anticipated.	No	No
Neighborhoods	Changes in access may occur at the three interchanges, where access would be improved by providing a link to the proposed roadway.	No encroachment-alteration impacts are anticipated.	Neighborhoods are affected by transportation infrastructure in terms of changes to access and travel patterns. Roadways exist at the project termini and changes would occur at Bliss Spillar Rd. Planning experts from the jurisdictions within the AOI do not expect significant development to occur as a result of the proposed SH 45SW project. Experts contacted in Buda and Hays County asserted that the developments currently planned for the area would be constructed regardless of whether the proposed project were built or not. While experts with the City of Austin and Travis County acknowledged that they expect the roadway to affect the amount and rate of development in the AOI, both also pointed to the minimal effect the proposed project would have on development in the region, given the area's high rate of growth overall. Therefore, impacts to neighborhoods resulting from induced growth associated with the Build Alternative are not anticipated to be substantial.	No

Table 4-2: Resources Analyzed for Indirect Impacts cont'd

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Environmental Justice	No low-income or minority populations would be disproportionately impacted by the construction of the proposed project. No low-income populations (defined as over 50 percent of the population living in households with incomes at or below the 2014 DHHS poverty guideline) are found in the AOI. While concentrated minority populations do exist within the northeastern portion of the AOI, and would be included in outreach efforts, minority status alone would not result in disproportionate or adverse impacts associated with tolling.	No encroachment-alteration impacts are anticipated.	EJ groups are comprised of vulnerable populations, including minorities and low income persons. TxDOT follows principles in E.O. 12898 and Title VI to provide protections for EJ populations. Project-induced growth is not anticipated to have a significant effect on neighborhoods, including those in EJ communities. Displacements from project-induced growth are not anticipated. The Project Level Toll and EJ analysis did not identify a disproportionate, adverse effect to low-income or minority populations. Therefore, it is not anticipated that induced growth would disproportionately impact EJ communities.	No
Parks and Recreational Resources	No parkland would be acquired for this project, nor would access changes to park facilities occur.	No encroachment-alteration impacts are anticipated.	Parklands are an important resource but are not vulnerable because public parklands in the AOI are protected by municipal codes and federal laws such as the Land and Water Conservation Act, and Section 4(f) for federally funded transportation projects.	No
Floodplains	Floodplains that occur within the SH 45SW ROW include approximately 4.74 acres of floodplain associated with Little Bear Creek, 5.91 acres of floodplain associated with Bear Creek, and approximately 18.55 acres associated with tributaries to Slaughter Creek, which include Danz Creek. Based on current preliminary design, the creeks would be bridged. It is assumed that the bridges would not increase the base flood elevation; therefore, no floodplain impacts would be expected to occur as a result of the proposed project.	No encroachment-alteration impacts are anticipated.	No	No
Noise	The current noise conditions would be altered with the addition of the proposed roadway. Additional traffic noise, defined as unwanted sound, would be generated through the study area. Projected traffic data have been utilized in noise modeling software (Traffic Noise Model (TNM) 2.5 in accordance with TxDOT's Guidelines for Analysis and Abatement of Roadway Traffic Noise to predict the traffic noise impact on noise sensitive receivers. Four receivers would be impacted.	No encroachment-alteration impacts are anticipated.	TxDOT Guidelines are designed to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on such known impacts of noise on people as speech interference, sleep interference, physiological responses, hearing loss and annoyance. Projected traffic data have been utilized in noise modeling software to determine if receivers in the study area are vulnerable to noise impacts. Four receivers would be impacted but barriers would not be feasible. Noise contours have been identified. No concerns about quiet zones have been expressed by area residents; project would comply with noise requirements.	No

Table 4-2: Resources Analyzed for Indirect Impacts cont'd

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Threatened and Endangered Species	Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, there are anticipated to be no impacts to this species from the proposed project. Two endangered salamander species, the Austin blind salamander and the Barton Springs salamander, would not be directly impacted by the proposed project (SWCA and Cambrian Environmental, 2014). Based on best available information, no impacts to federally listed karst invertebrates would occur as a result of the proposed project (SWCA and Cambrian Environmental, 2014).	Encroachment-alteration impacts could occur as a result of habitat loss due to increased development in the area, an increase in edge habitat, an increase in impervious cover limiting recharge to the Edwards Aquifer, or an increase in ambient noise. Golden-cheeked Warblers have been shown to be sensitive to edge habitat as a result of fragmentation. Fragmented habitat can lead to declines in the Golden-cheeked Warbler population due to an increase in nest predation, brood parasitism, and interspecific competition in edge habitat. Both the Barton Springs and Austin blind salamanders are entirely dependent on the Edwards Aquifer. Changes to the aquifer as a result of decreased recharge or an increase in pollutants in stormwater runoff (stemming from increased impervious cover in the Recharge Zone) could potentially impact these species. The Build Alternative would run near Flint Ridge Cave (FRC). However, with the proposed design, no runoff from disturbed areas would enter the cave. The roadway design was revised in fall 2014 to move even farther from FRC, thus reducing the encroachment on the FRC drainage area. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom of the rail. These inlets would be connected to an underground storm sewer system which would outfall into the water quality pond located under the Bear Creek north bridge abutment. No untreated runoff associated with the roadway would enter FRC or its surface watershed. The size of the FRC watershed would be maintained. Based on available information (SWCA and Cambrian 2014), there is no known habitat for listed karst species within the state-owned ROW.	Threatened and Endangered Species are vulnerable by definition and are therefore afforded protection under the Endangered Species Act. Golden-cheeked Warblers (GCWAs) are an endangered migratory songbird. During their breeding and nesting season within the U.S., GCWAs are only found in Texas. Their wintering habitat is in southern Mexico and Central America. Some GCWA habitat could be converted from habitat areas to developed uses in the AOI, subject to compliance with the ESA. Both the Austin blind salamander and the Barton Springs salamander are only known from the waters of Barton Springs in south Austin. Both species are neotenic, meaning that they never develop lungs and spend all their lives in water. The Austin blind salamander is primarily troglobitic and spends the majority of its life within the aquifer, whereas the Barton Springs salamander is epigean, spending most of its life at the surface of the aquifer at the interface between subterranean and freshwater spring habitat. The Austin blind salamander and the Barton Springs Salamander would not be directly impacted by the proposed project. However, they could be indirectly impacted due to possible groundwater impacts from induced development. Based on currently available information, listed karst species are not expected to be impacted by the proposed project.	Yes
Vegetation and Wildlife Habitat	Approximately 161 acres of vegetation and wildlife habitat (including 139 acres of permanent impacts and 22 acres of temporary impacts) would be directly impacted by the proposed project.	Encroachment-alteration effects stemming from the proposed project could result in additional loss and fragmentation of vegetation and habitat types on developable lands within the study area. However, because the proposed roadway would lack frontage roads and would be bordered by protected Water Quality Protection Lands (WQPLs), the amount of encroachment on vegetation and habitat is limited.	There is similar habitat found throughout the project study area and the AOI. Based on Ecological Mapping Systems of Texas (EMST) data, there are no rare vegetation types found within the state-owned ROW or in the surrounding study area. Impacts to and mitigation for potential GCWA habitat will be discussed in the GCWA section.	No

Table 4-2: Resources Analyzed for Indirect Impacts cont'd

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Soils and Geology	Soils and geologic resources may be subject to erosion and sedimentation due to the proposed project; however, these impacts would be minimized through the use of BMPs. More than 220 individual landscape features in the state-owned ROW were investigated as potential recharge features. Of these, 193 were determined to be not of karst origin. Twenty-seven features were determined to be of karst origin and can be divided into sensitive and non-sensitive categories. Ten features were categorized as non-sensitive. The seventeen sensitive features include five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge. Some features were determined to be fault-related. The proposed alignment has been adjusted to avoid the openings or surface expressions of these sensitive features. The proposed project would impact the surface drainage basins of two sensitive features in the state-owned ROW and Flint Ridge Cave; the project would include measures to divert flow from compensating drainage areas adjacent to the natural drainage areas. In addition, a bottomless culvert is planned to span feature F-55 to allow upgradient water to infiltrate as it is conveyed beneath the roadway and provide recharge to the feature.	Limited encroachment-alteration impacts are anticipated due to the lack of frontage roads, prevalence of WQPLs along the proposed route, and use of BMPs that would minimize soil compaction, erosion, and sedimentation. Placement of the roadway could encroach on the surface or subsurface drainage areas of adjacent caves/karst recharge features, altering the hydrologic regime in those features.	Recharge features, including fractures, sinkholes, and caves, contribute to the unique hydrogeology typical of karst systems and allow for recharge to the underlying Barton Springs segment of the Edwards Aquifer. Karst features can also provide habitat for karst species. Recharge features allow for rapid infiltration and recharge to the underlying Edwards Aquifer. Due to the rapid rates of recharge and groundwater flow, the Edwards Aquifer, like other karst aquifers, is highly productive but also vulnerable to contamination. The species that depend on karst habitats are also sensitive due to their specific habitat needs.	No (Karst Geology to be addressed in conjunction with groundwater recharge features)

Table 4-2: Resources Analyzed for Indirect Impacts cont'd

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Water Resources - Edwards Aquifer/ Groundwater	Potential consequences of the proposed project would be negligible due to the small amount of proposed impervious cover and proposed BMPs. TSS loadings after construction would be lower than native existing conditions due to proposed BMPs. Potential for pollutants in stormwater runoff from the construction site and completed roadway to enter the aquifer and potential for reductions in recharge to the aquifer resulting from increases in impervious cover would be minor. Impacts would be minimized by the use of robust BMPs during roadway construction and operation. The Build Alternative would run near Flint Ridge Cave. However, with the proposed design, no runoff from disturbed areas or the eventual roadway surface would enter the cave. The roadway design was revised in fall 2014 to move even farther from FRC, thus reducing the encroachment on the FRC drainage area. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom of the rail. These inlets would be connected to an underground storm sewer system which would outfall into the water quality pond located under the Bear Creek north bridge abutment. No untreated runoff associated with the roadway would enter FRC or its surface watershed. The size of the FRC watershed would be maintained.	Encroachment-alteration effects to water quality could occur primarily due to increased impervious cover or removal of vegetation that results in increased runoff and altered recharge (flow and quality) to the aquifer. Placement of the roadway could encroach on the surface or subsurface drainage areas of adjacent caves/karst features, altering the hydrologic regimes in those features.	The Barton Springs segment of the Edwards Aquifer supplies drinking water for approximately 60,000 people in Travis and Hays counties and provides habitat for the Barton Springs and Austin blind salamanders. The Barton Springs segment of the Edwards Aquifer has unique hydrogeology that produces a high-quality water source that is also vulnerable to contamination (see Mahler et al., 2006; Herrington and Hiers, 2010 regarding the presence of contaminants of aquifer water detected by researchers over past decades). The aquifer also provides habitat for aquifer-dependent species that are sensitive due to their specific habitat needs. The AOI contains 5,772 ac of Contributing Zone (13.9%), 22,092 ac of Recharge Zone (53.0%), 5,792 ac of Transition Zone (13.9%), 1,157 ac of Contributing Zone within Transition Zone (2.8%), and 6,861 ac of Saline Zone (16.5%) for a total of 41,674 ac. There are 1,056 recorded water wells including 43 observation wells (TWDB, 2013; BSEACD, 2014). There are 13 springs mapped in the AOI (BSEACD, 2014). **See Figure 4-1**.	Yes

Table 4-2: Resources Analyzed for Indirect Impacts cont'd

Resource	Will the resource be directly impacted?	What encroachment impacts are anticipated if any?	Is this resource at risk?	Resource included in detailed indirect impact analysis (yes/no)?
Water Resources – Surface Water and Wetlands	The project crosses Little Bear Creek, Bear Creek, and tributaries to Slaughter Creek, including Danz Creek. Based on preliminary design information, the creeks would be bridged. Permanent impacts to waters of the U.S. are not anticipated due to bridging and/or due to minimization of fill in W.O.T.U.S. No wetlands would be impacted. Temporary impacts to surface water quality would include potential stormwater runoff and contamination during construction. These impacts would be minimized through required utilization of robust Best Management Practices during construction as detailed in the Water Quality Technical Memorandum. Permanent BMPs proposed include porous friction course (PFC), pavement, grassy vegetated swales, and hazmat traps.	Encroachment-alteration effects associated with the proposed project could occur as increased impervious cover causes increased runoff and decreased water quality downstream. Impacts may also occur where vegetation has been cleared during construction, as removal of vegetation could accelerate off-site erosion.	The resource provides drinking water to customers of the City of Austin Water Utility and recharges the Edwards Aquifer, which also serves as drinking water to numerous communities in Central Texas. Surface water resources provide habitat for wildlife. There are 66 linear miles of creeks in the AOI including Danz Creek, Slaughter Creek, Bear Creek, Little Bear Creek, Garlic Creek, and Onion Creek (a TPWD ecologically significant stream segment). Approximately 19 percent of the AOI is Water Quality Protection Lands owned by the City of Austin(**Figure 4-2)**. According to the Texas Commission on Environmental Quality (TCEQ) 2012 Section 303(d) list, Danz Creek drains to impaired Water Quality Segment 1427A – Slaughter Creek, just north of the study area, due to an impaired macrobenthic community (visible organisms found on/in the creek soil). Data indicate that water quality and quantity fluctuate over time but appear to be stabilizing. Due to connectivity with groundwater (see Hauwert, 2004 and 2012 regarding dye tracer studies), surface water quality and quantity are also pertinent to threatened and endangered species issues. This connectivity occurs where karst features provide habitat to karst species and aquifers provide habitat for aquifer-dwelling species.	Yes (Surface Water)
Air Quality	The Austin-Round Rock-San Marcos MSA is currently in attainment or unclassifiable for all air pollutants under the National Ambient Air Quality Standards (NAAQS). Direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity and accessibility, as well as the resulting projected increases in VMT. However, EPA's new fuel and vehicle standards projected to reduce emissions of air pollutants and MSATs are expected to offset these impacts resulting from the increases in VMT. These net emissions reductions are expected to contribute to continued maintenance and improvement of air quality and MSAT levels.	No encroachment-alteration impacts are anticipated. The potential indirect impacts on air quality and MSATs are primarily related to any expected development/redevelopment resulting from the project's increased accessibility or capacity to the area. However, any increased air pollutant emissions resulting from the potential development or redevelopment of the area must meet regulatory emissions limits established by the TCEQ and EPA, as well as obtain appropriate authorization from the TCEQ. Regulatory emission limits set by TCEQ and EPA are established to attain and maintain the NAAQS by assuring any emissions sources resulting from new development or redevelopment will not cause or contribute to a violation of those standards.	Because the project's potential direct and indirect impacts on air quality and MSATs are projected to be offset by federal fuel and vehicle control programs or state and federal regulatory programs, negative impacts on air quality are not anticipated.	No

Figure 4-1: Edwards Aquifer Zones and Water Wells within AOI

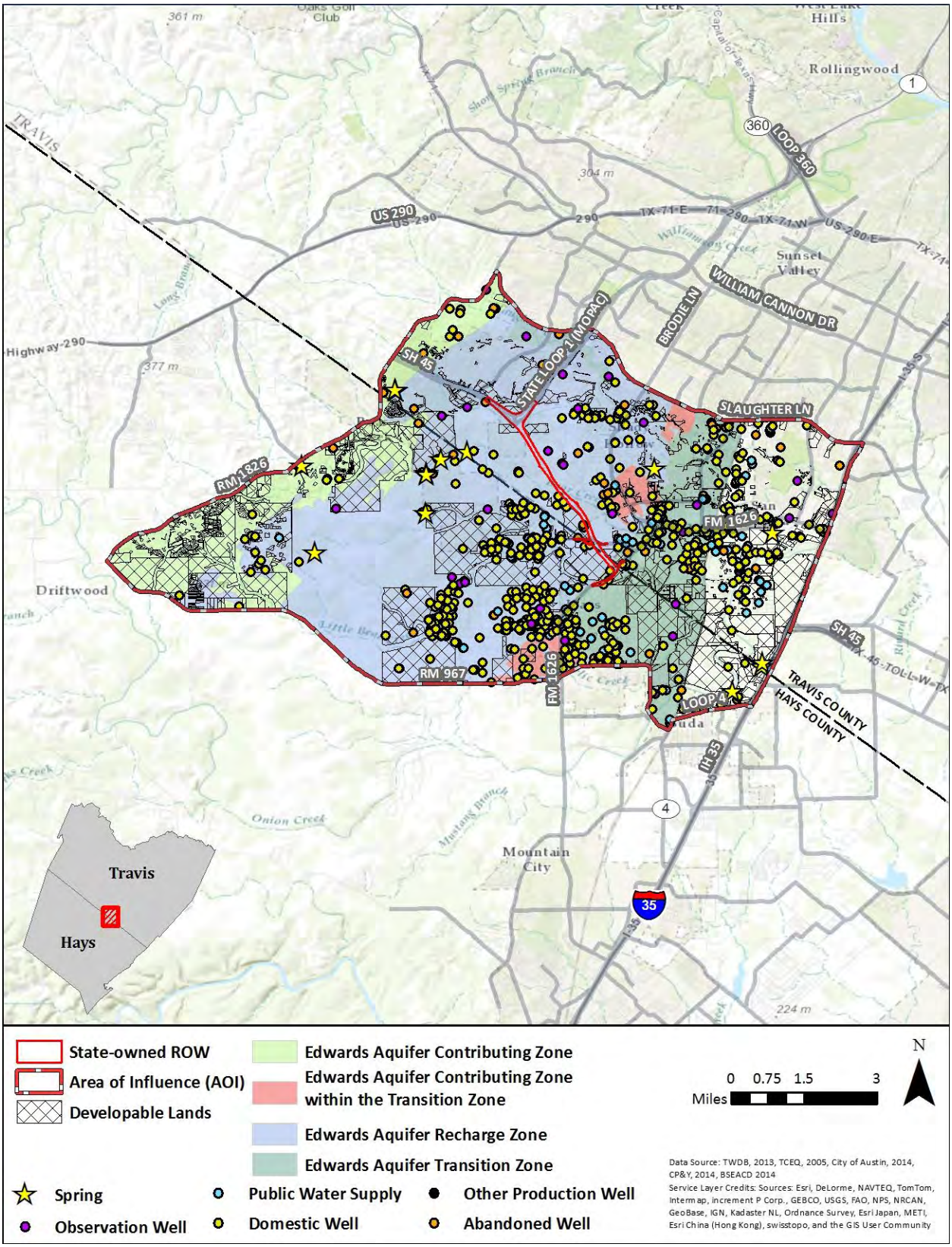

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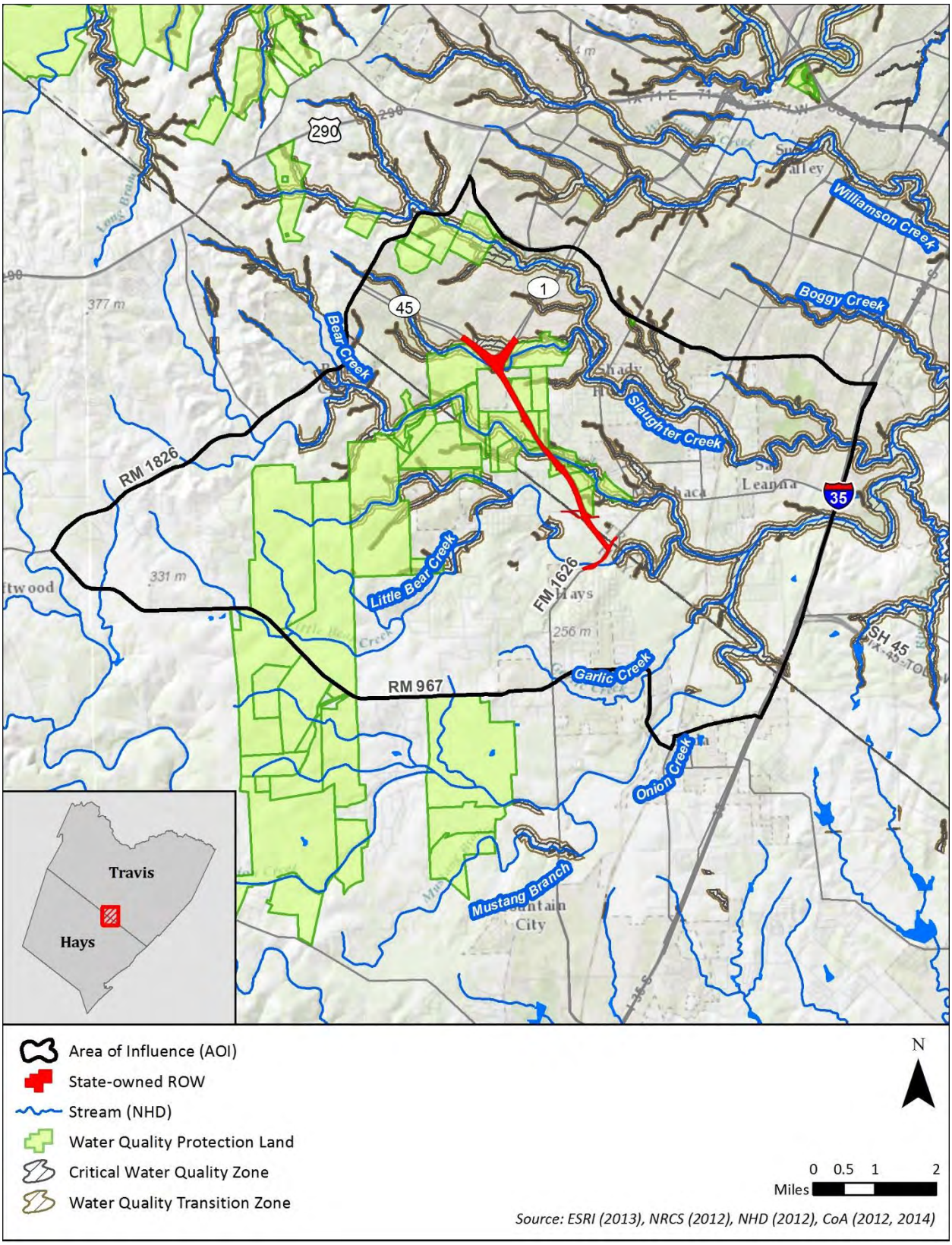
Figure 4-2: Surface Water Resources in the AOI



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Based on this analysis, the following resources will be analyzed in more detail for potentially substantial indirect impacts: threatened and endangered species, and water resources: Edwards Aquifer/groundwater (including related karst geology) and surface water.

5.0 GOALS AND TRENDS

The purpose of this section is to describe the general trends and community goals within the AOI, including community planning goals, demographic and development trends, factors influencing growth, and areas of environmental or social sensitivity. A key question to be addressed in this analysis is whether or not land use growth and development is anticipated and planned for within the AOI and whether or not protection of sensitive resources is among the goals and trends for the communities in the AOI. Information contributing to this description comes from local planning documents, agency goals and mission statements, local and/or regional trend data collected for the proposed study area, and communications with local planners. This analysis uses a temporal boundary of 2035 (in order to identify reasonably foreseeable future development), which coincides with the planning horizon for the Capital Area Metropolitan Planning Organization's (MPO's) current Metropolitan Area Transportation Plan (MATP). **Figure 5-1** shows various municipalities and political jurisdictions within the AOI.

5.1 Goals

City of Austin

Sixty percent (24,988 ac) of the AOI lies within the City of Austin's (COA) jurisdiction or extra-territorial jurisdiction (ETJ). Over half of this land is part of the City's full and limited purpose jurisdictions (13,072 ac), but 11,916 acres (29 percent) of the AOI lie within the COA's two-mile and five-mile ETJs, where the COA has no zoning authority but where development is subjected to city subdivision and water/wastewater regulations. Land within a city's ETJ may be annexed in the future, bringing development in these areas under the city's zoning and permitting requirements.

The COA has enacted several watershed protection ordinances over the last three decades to protect water quality through land use and development controls. To this end, the western Drinking Water Protection Zone (DWPZ) – in which the AOI is located – and the eastern Desired Development Zone (DDZ) were created with the goal of funneling development into the DDZ through use of development incentives (COA, 2012). This goal of directing growth east and south into the DDZ is echoed in the *Imagine Austin Comprehensive Plan*, adopted in 2012 to guide growth and development in the city of Austin.

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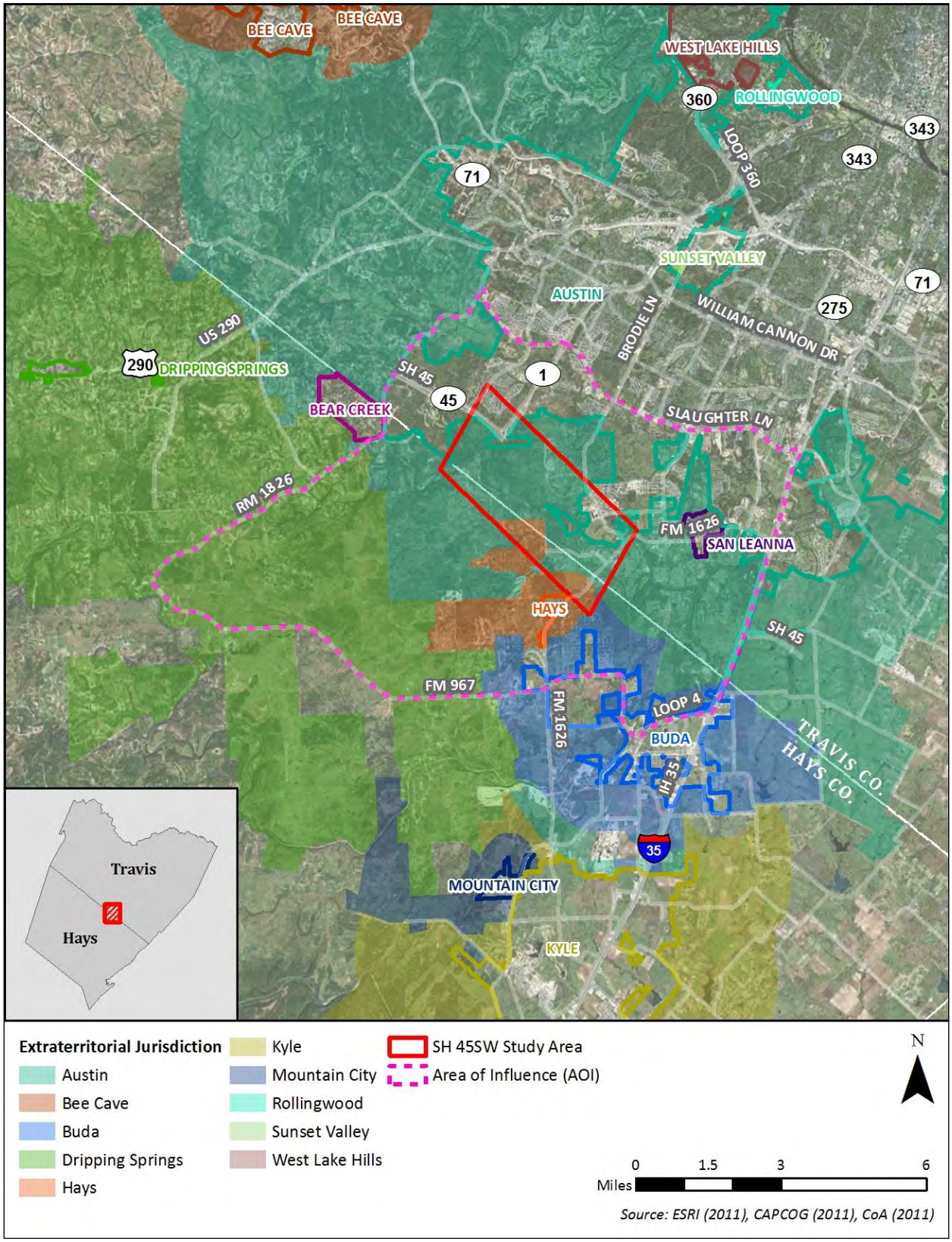
Figure 5-1: Political Jurisdictions in the AOI



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The *Imagine Austin* plan has eight priority programs including the following:

- Invest in a compact and connected Austin
- Sustainably manage our water resources
- Continue to grow Austin's economy by investing in our workforce, education systems, entrepreneurs, and local businesses
- Use green infrastructure to protect environmentally sensitive areas and integrate nature into the city
- Grow and invest in Austin's creative economy
- Develop and maintain household affordability throughout Austin
- Create a Healthy Austin Program
- Revise Austin's development regulations and processes to promote a compact and connected city

The *Imagine Austin* comprehensive plan included extensive public outreach and was adopted by the Austin City Council in June 2012 (COA, 2012).

City of Austin - Amended Barton Springs Habitat Conservation Plan

The *Amended Barton Springs Habitat Conservation Plan* (HCP) details the actions the City of Austin will conduct that adversely affect the Barton Springs salamander and the Austin blind salamander and their habitats, and how the impact of those actions will be reduced or compensated to protect both species. The plan covers actions by the City in and around Barton Springs that may affect the Barton Springs salamander or the Austin blind salamander. The HCP was amended in July 2013.

The Plan Area for the amended HCP consists of a polygon surrounding the Barton Springs complex, which provides all known habitat of the Barton Springs and the Austin blind salamanders. The area is entirely owned by the City and is part of Zilker Park in Austin, Travis County, Texas. The Plan Area is almost entirely within the boundaries of proposed critical habitat for the Austin blind salamander. Most of the proposed critical habitat is also within Zilker Park and owned by the COA.

The goals of amended HCPs are as follows:

- Protect the evolutionary potential of wild and captive populations of Barton Springs and the Austin blind salamanders

- Maintain or restore natural ecosystem characteristics of Barton Springs and the Austin blind salamanders habitat to the maximum extent practicable
- Reduce and mitigate the impacts of detrimental anthropogenic pollutants on salamanders or their habitat
- Restore and maintain natural flow regimes in Barton Springs Pool, Eliza Spring, Old Mill Spring, and Upper Barton Spring to the maximum extent practicable
- Reduce the harassment or harm of Barton Springs and the Austin blind salamanders imposed by the cleaning, maintenance and operation of Barton Springs Pool
- Improve efficiency of cleaning and maintenance of Barton Springs Pool
- Continue to collect, manage, and share data on Barton Springs and the Austin blind salamander populations and their habitats (COA, 2013).

The USFWS issued a recovery plan for the Barton Springs salamander on September 21, 2005. The primary threats or reasons for listing the Barton Springs salamander were "the degradation of the quality and quantity of water that feeds Barton Springs" as a result of urban expansion over the watershed. The species' restricted range makes it vulnerable to both acute and chronic groundwater contamination. The salamander is also vulnerable to catastrophic hazardous materials spills, increased water withdrawals from the Edwards Aquifer, and impacts to the surface habitat. The goal of this recovery plan is to ensure the long-term viability of the Barton Springs salamander in the wild to the point that it can be delisted.

The Austin Blind salamander was listed by the USFWS as endangered on September 19, 2013. It is found in three of the four Barton Springs outlets in Zilker Park: Parthenia (Main) Springs, Eliza Springs, and Sunken Garden (Old Mill or Zenobia) Springs (Federal Register, 2013). As this species was so recently listed, no recovery plans for the Austin Blind salamander have yet been developed. However, as this species has the same habitat requirements as the Barton Springs salamander, it is assumed that any recovery plan actions that would benefit the Barton Springs salamander would also benefit the Austin blind salamander and that the recovery efforts would have similar if not identical goals.

See also **City of Austin and Travis County – Balcones Canyonlands Conservation Plan**, discussed below.

City of Buda

Only a small portion of the AOI falls within Buda's city limits (1.8 percent, or 767 ac). Buda's ETJ covers a slightly larger area in the AOI: approximately 2,285 ac or five percent. Like *Imagine Austin*, the *Buda 2030 Comprehensive Plan* also supports limiting growth in the

environmentally sensitive areas west of the city by designating a swath of land that lies within the study area as a "green growth district" whose purpose is to establish protective measures (such as preserving floodplains around Garlic and Onion Creeks) for sensitive environmental features and protect Buda's drinking water supply (City of Buda, 2011). The City of Buda's water supply comes from both surface water (Canyon Lake) and groundwater (Edwards Aquifer).

The City of Buda's *2030 Comprehensive Plan (*September 2011) includes the following goals and objectives (among others not all listed here):

- **Economic Growth & Sustainability Goal**: *Buda has a stable tax revenue base and strong local job market. Increased and diversified economic and job opportunities for residents make Buda a great place to live, work, shop, and play.*
    - Provide infrastructure to support economic development.
- **Transportation Goal**: *Buda has a transportation system that meets current needs and anticipated growth, that balances transportation options including driving, walking, bicycling, and mass transit, and that is designed in a manner that respects and enhances the character of Buda.*
    - Plan roadway improvements for existing conditions and future demand.
    - Explore public transportation opportunities to improve commuting to Austin and San Marcos.
    - Create a well-connected street network to improve connectivity throughout Buda.
    - Pursue and encourage traffic management techniques throughout the City of Buda.
    - Promote and encourage walking and bicycling as transportation alternatives to the automobile.
- **Parks, Recreation, and Open Space Goal**: *Buda has a superior system of parks, recreation, trails, and open space that enhances the quality of life for all residents of Buda.*
    - Ensure successful implementation and maintenance of parks and recreation resources.
    - Focus funding and efforts to make improvements to existing parks.

  - Develop a citywide trail network that connects parks, open space areas, residential areas, downtown, shopping centers, and other destinations throughout Buda.
  - Protect Buda's environmental quality and identity by preserving the existing "urban forest".

- **Housing & Neighborhoods Goal**: *Buda has a blend of old and new neighborhoods that are full of character, interesting, sustainable, and retain their value over time. Anyone can find a house that serves his or her needs and preferences for their entire life.*
  - Ensure that new subdivisions and neighborhoods are of a high standard and sustainable quality that promote connectivity, walkability, and a sense of identity.
- **Community Identity Goal**: *Buda is a unique community with a charming small town character, active neighborhoods, and many entertainment and recreation opportunities.*
- **Public Safety Goal**: *Buda is one of the safest communities in the nation with a strong and friendly police, fire, and emergency service personnel.*
- **Downtown Buda Goal**: *Buda's downtown thrives as the "heart of Buda" with strong economic opportunities and celebrates the city's historical and cultural heritage, making downtown a vibrant place to live, work, and play.*
  - Enhance the economic viability of downtown Buda.
- **Historic Preservation Goal**: *Buda protects its history and unique character by preserving its historic properties while affording opportunities for economic development and facility improvement.*

Hays County

Approximately 6,819 acres of the AOI lie outside the boundaries of incorporated areas in Hays County. Because the COA's WQPLs and DDZ incentives and Buda's green growth district seek to manage growth in the environmentally sensitive lands within the study area, anticipated future population growth and development in the area may migrate to vacant, developable lands within the AOI. Hays County recognizes that this future growth will put pressure on the existing transportation system: the *Hays County Transportation Plan* (2013) cites this anticipated future growth and its resultant impacts on traffic congestion as contributing to an increased need for new and improved roadway facilities.

Hays County Regional Habitat Conservation Plan

Hays County has a stated goal of providing local solutions for conserving endangered species, open space, and cultural heritage. Adopted by Hays County Commissioners in 2013, the *Hays County Regional Habitat Conservation Plan* (RHCP) "provides a locally controlled approach for compliance with the Federal Endangered Species Act (ESA) by allowing the County to offer mitigation credits for otherwise lawful development on land where there could be 'incidental takings' of protected species. In Hays County, the ESA applies to two endangered songbirds, the golden-cheeked warbler and the black-capped vireo, but the RHCP could protect as many as 56 additional species considered rare or threatened. An approved RHCP allows landowners who have qualifying habitat acreage and want to preserve it as open space to voluntarily donate or sell it to the County. In turn, the County can help streamline public projects and private development in areas where the ESA applies by providing "credits" that offset the "takings" of land where protected species might be impacted. The County initially plans to offer the credits for development at $7,500 per credit acre" according to Hays County's website about the RHCP (Hays County, 2014).

Travis County

Travis County's Department of Transportation and Natural Resources (TNR) is responsible for (Travis County TNR, 2014):

- The engineering, design, construction, and maintenance of Travis County roads, drainage and bridges;
- Fleet services for all county vehicles and equipment;
- Environmental protection;
- Solid waste management and resource conservation;
- Parks and natural resource preservation;
- Capital improvement projects;
- Land development review, permits and flood plain management regulations in Travis County.

According to the TNR's *Travis County Capital Improvement Projects* (2013a), two road improvement projects and one bridge improvement project are proposed within the AOI.

Travis County and City of Austin – Balcones Canyonlands Conservation Plan (BCCP)

In recognition of the common goal of protecting endangered species with habitat located in the city of Austin and in Travis County, these entities undertook creation of a regional habitat conservation plan as a vehicle for compliance with the Endangered Species Act. The BCCP was a plan written by COA and Travis County in order to obtain an incidental take permit for Golden-cheeked Warblers, black-capped vireos, and six species of federally endangered karst invertebrates under section 10(a)(1)(B) of the ESA. The take covered by the permit would include direct and indirect takes associated with grading, clearing, or other earth-moving activities necessary for residential, commercial, or industrial development and infrastructure projects as well as indirect impacts, such as noise, predation, and harassment from the occupancy and use of these structures. As a part of the BCCP, approximately 30,428 acres of Golden-cheeked Warbler and Black-capped Vireo habitat will be protected within a preserve system called the Balcones Canyonlands Preserve (BCP). The BCCP includes the goal of protecting 62 caves including Flint Ridge Cave. The habitat protected by the BCP is considered to be some of the highest quality and least fragmented habitat of any county in the Golden-cheeked Warbler's range. Areas covered by the BCCP in the event of incidental take include all of Travis County with the following exceptions: the BCP, portions of the Balcones Canyonlands National Wildlife Refuge (BCNWR) that fall within Travis County, and areas within city limits and planning jurisdictions of municipalities that are not participating in the BCCP. The permit will last for 30 years (COA & Travis County, 1996).

Hays City

This is a town of approximately 200 people, and no articulated or published goals could be located by the project team.

Village of San Leanna

This is an unincorporated village of approximately 500 people, and no articulated or published goals have been developed.

Capital Area Metropolitan Planning Organization (CAMPO)

CAMPO is responsible for transportation planning in the six-county Austin metro region, which includes Hays and Travis counties. The vision statement for their 2035 plan is: "Develop a comprehensive multimodal regional transportation system that safely and efficiently addresses mobility needs over time, is economically and environmentally sustainable, and supports regional quality of life" (CAMPO, 2010). The plan calls for a four-lane toll freeway between MoPac and FM 1626.

Barton Springs Edwards Aquifer Conservation District (BSEACD)

The 70th Texas Legislature created BSEACD in 1987 as a Groundwater Conservation District (GCD) under what is now Chapter 36 of the Texas Water Code; the directive of which is to "conserve, protect, and enhance the groundwater resources in its jurisdictional area." After the GCD was in place, they were given the authority to "undertake various studies, to implement structural facilities and non-structural programs to achieve its statutory mandate, and to make rules under what is now Texas Water Code 36 to implement its policies and procedures and to help ensure the management of the groundwater resources…" While the jurisdictional area of the GCD is defined by the boundaries of the Edwards Aquifer, the GCD regulates groundwater from all aquifers in the area. Their mission statement is: "The Barton Springs/Edwards Aquifer Conservation District is committed to conserving, protecting, recharging, and preventing waste of groundwater, and preserving all aquifers in the GCD" (BSEACD, 2014).

5.2 Trends

5.2.1 Population and Housing Development

This section includes information about trends that characterize the AOI over time. In general, this area of south Travis/northern Hays County has grown considerably over the past decades as shown in terms of population change, housing starts and predominant construction periods over time, and employment growth over time.

The Austin area has experienced significant and sustained growth over the last four decades, with the populations of Hays and Travis counties increasing by 468 percent and 247 percent, respectively, over the period 1970 to 2010 (Texas Almanac, US Census). The City of Austin grew by more than 200 percent; Buda's size has increased more than 1,000 percent; and the Village of San Leanna grew by more than 90 percent from 1970 or the date of available information. Population change for Travis County, Hays County, and the study area communities is shown in **Table 5-1** and **Table 5-2**.

Table 5-1: Current and Historic Population Growth in the AOI

City or County	Total Population by Year					% Change from 1970-2010
	1970	1980	1990	2000	2010	
City of Austin	251,808	345,890	465,622	656,562	790,390	+ 213.9%
City of Buda	498	597	1,795	2,404	7,295	+ 1,364.9%
Village of San Leanna	(Year of incorporation)	259	325	384	497	+ 91.9%
Hays City	(Prior to incorporation*)	286	251	233	217	-24.1%
Travis County	295,516	419,573	576,407	812,280	1,024,266	+ 246.6%
Hays County	27,642	40,594	65,614	97,589	157,107	+ 468.4%

*Sources: Texas Almanac 1980-81; Smyrl; Texas State Library and Archives Commission, 2013; City of Austin, 2013; U.S. Census Bureau, 1990 - 2010. * Census information is unavailable for unincorporated communities.*

Table 5-2: Projected Population Growth in the AOI

City or County	Total Population by Year (Projected 2020-2040)				% Projected Change from 2010-2040
	2010	2020	2030	2040	
City of Austin	790,390	984,640	1,162,199	1,338,714	+ 69.4%
City of Buda	7,295	9,831	14,132	19,369	+ 165.5%
Travis County	1,024,266	1,273,260	1,508,642	1,732,860	+ 69.2%
Hays County	157,107	238,862	313,792	398,384	+ 153.6%

*Sources: Texas Water Development Board. *Note that the Texas Water Development Board does not provide population projections for Hays City or the Village of San Leanna.*

Austin is expected to grow by 69 percent between 2010 and 2040, while Buda is projected to grow more than 165 percent. Travis County is projected to grow by more than 708,000 people (69 percent) by 2040, while Hays County is expected to grow by more than 241,000 people (150 percent) according to TWDB. See **Table 5-2**.

Residential new house construction is an indicator of growth trends in the area of influence. See **Table 5-3** for new house construction by year between 1997 and 2012. Growth in Buda was substantial in 1999-2000 and from 2006-2012. Yearly building permits in Austin were between 1,000 and about 4,600 between 1997 and 2012, peaking in 2005.

Table 5-3: Single-Family New House Construction Building

Year	City of Buda	Village of San Leanna	City of Austin
1997	3	2	2,380
1998	90	1	3,521
1999	330	2	3,302
2000	316	6	3,361
2001	45	1	2,119
2002	43	2	2,431
2003	1	28	3,117
2004	94	14	3,533
2005	200	4	4,569
2006	334	3	4,340
2007	394	2	3,155
2008	382	2	1,928
2009	299	2	1,951
2010	272	0	1,664
2011	279	0	1,713
2012	306	1	2,539
Total*	**3,388**	**70**	**45,623**

Source: http://www.city-data.com/city/ accessed 1-13-2014.
**Total provided for available time period. Data were not available for the community of Hays. Note that only part of Buda and Austin fall within the AOI.*

Table 5-4 includes data from 1970 to present, showing that the period between 2000 and 2009 was the decade in which the largest portion of development occurred within the AOI. In Austin, the largest portion of construction within the time period from 1970 to 2009 occurred from 1980 – 1989. Development in both counties substantially occurred between 2000 and 2009.

Table 5-4: Year Structure Built/Percent Built within Decade for Entities in AOI between 1970 and 2010 or later

Geography	Total Homes	Year Structure Built/Percent of Houses Built in that Decade									
		2010 or later		2000-2009		1990-1999		1980-1989		1970-1979	
		#	%	#	%	#	%	#	%	#	%
Hays Co	59,870	800	1.3%	**22,888**	**38.2%**	11,413	19.1%	11,204	18.7%	7,634	12.8%
Travis Co	441,762	2,983	0.7%	**108,858**	**24.6%**	79,725	18.0%	90,927	20.6%	78,452	17.8%
Austin	354,901	1,896	0.5%	73,308	20.7%	56,696	16.0%	**75,981**	**21.4%**	72,331	20.4%
AOI	22,050	165	0.7%	**10,091**	**45.8%**	5,538	25.1%	4,120	18.7%	1,259	5.7%

Source: ACS 2008-2012 (B25034 - Year Structure Built). *Note: Decade with Highest Percentage in **Bold**. Travis County data includes some City of Austin data.

Table 5-5 contains information on employment projections from CAMPO's *Metropolitan Area Transportation Plan*. Employment growth in Hays County is predicated to be more than 100 percent between 2015 and 2035, compared to 45 percent over the same time period in Travis County as more land in Travis County is already developed, compared to Hays County.

Table 5-5: CAMPO Projected Employment by County/Percent Growth 2015 – 2035

	Projected Employment			
County	2015	2025	2035	% change 2015 – 2035
Hays	66,200	97,800	137,300	107.4
Travis	707,200	843,500	1,026,500	45.1

Source: CAMPO, 2035 MATP

6.0 IMPACT-CAUSING ACTIVITIES TABLE AND SUMMARY

Several general categories of impact-causing activities are relevant to the proposed project, as shown in **Table 6-1**. These are likely to occur as a result of transportation projects and other similar development. According to TxDOT (2010), impact-causing activities include all of the activities involved in the project, from clearing to maintenance of vegetation once the project is finished. These activities are relevant to encroachment-alteration effects and access-alteration effects. These ten categories of impact-causing activities are also identified in the NCHRP Report 466 and are described in **Table 6-1**.

Table 6-1: Impact-Causing Activities

Type of Activity	Project Specific Activity	Relevant Information
Modification of Regime	Removal of vegetation and wildlife habitat	Various types of vegetation would be removed for roadway ROW.
	Alteration of surface drainage	BMPs would be put in place to reduce and minimize any adverse impacts to water quality.
Land Transformation and Construction	Direct impacts from construction; construction noise and vibration	Existing land uses would be converted to roadway uses. Noise and vibration would result from construction equipment trenching, excavation, backfilling, grading, and pavement laying activities.
Resource Extraction	Excavation for embankment fill material; ponds	Surface and subsurface excavation could be required throughout the project limits for construction.
Processing	Storage of construction materials including aggregate, concrete pipes, traffic control barricades, steel rebar, road signs, etc., temporary construction office trailers equipped with temporary utility service including some means of sanitary waste disposal	Material storage areas and construction office trailers are commonly located within the project ROW during construction. BMPs would be put in place.
Land Alteration	Erodible materials exposed to surface runoff	Erosion Control and Sedimentation Control BMPs would be implemented and maintained until construction is complete. Post-Construction Total Suspended Solids Control BMPs would be implemented including PFC pavement and grassy vegetated swales.
	Landscaping	Landscaping in accordance with TxDOT specifications.

Table 6-1: Impact-Causing Activities (Direct Impacts) cont'd

Type of Activity	Project Specific Activity	Relevant Information
Access Alteration	Access created by construction of new roadway	Undeveloped land opened for development – SH 45SW would be a controlled access facility.
Chemical Treatment	Fertilization	When used, fertilizers are generally only used during the revegetative phase of the project, after which the use of fertilizers is discontinued.
	Deicing	TxDOT typically uses inert sand materials for ice control, and these are applied only on bridges and pavement over culverts.

Source: NCHRP 466.

The primary impact-causing activities would be modification of regime through removal of vegetation and wildlife habitat, and access alteration through development of a new controlled access roadway facility with limited access to the existing roadway network.

Impact-causing activities (or, generally speaking, development activities) have the potential to be substantial and could affect sensitive resources in the AOI, so potentially substantial indirect impacts are discussed below.

7.0 POTENTIALLY SUBSTANTIAL INDIRECT IMPACTS

This section examines potentially substantial indirect impacts to the sensitive resources identified within the AOI. Types of indirect effects include encroachment-alteration effects, which were discussed in the main body of the FEIS and summarized in **Table 4-2** of this Technical Report to the extent they contribute to the need for detailed analysis for indirect impacts. Access alteration effects (also known as project-influenced effects or induced growth effects), and effects related to project-influenced development (or effects related to induced growth) are discussed here.

7.1 Methodology

The techniques utilized for this analysis are primarily Planning Judgment, determined through holding meetings, administering questionnaires and conducting phone interviews with planning professionals in the project vicinity; Collaborative Judgment to the extent that numerous professionals were contacted as part of this analysis, including several representatives from agencies such as the COA; and Cartographic Techniques, in addition to expert technical analysis consistent with the methods described in NCHRP Report 466 and NCHRP Report 25-25.

This section includes a discussion of currently developed land within the AOI versus land available for development within the AOI. This Cartographic Technique exercise utilized data collected remotely and in the field, combined with analysis of various constraints layers and the proposed alignment outline utilizing Geographic Information Systems (GIS) technology. In addition, the results of questionnaires sent to planning experts were incorporated to the extent the information could be mapped. Additional technical analysis has been provided by project analysts, and a summary of the interviews conducted is included in **Section 8.3.3** with a summary of key points made by those who participated.

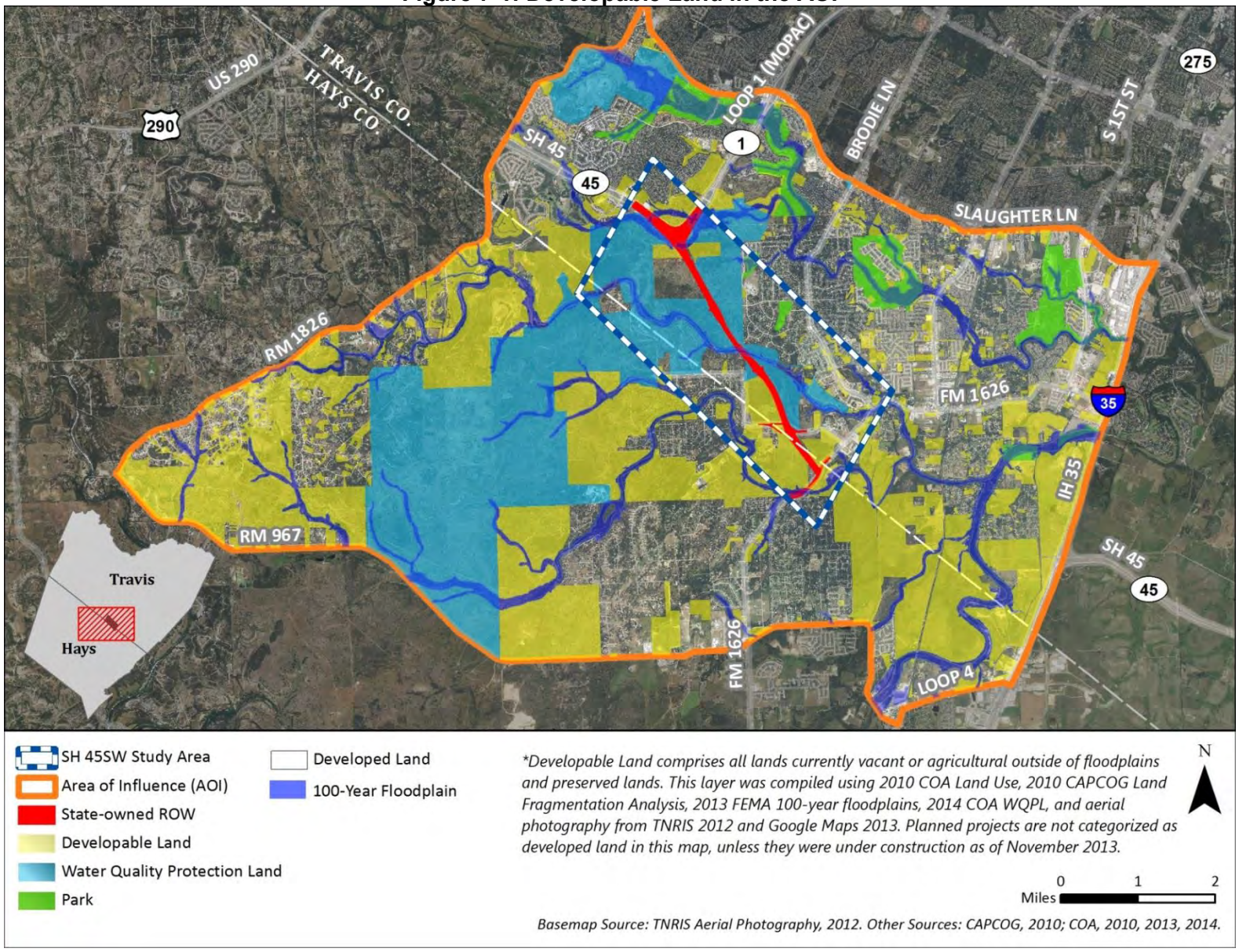
Land that is already planned or platted for development was not included in this total as it is assumed that land will be developed. The developable land was identified through planner questionnaires and cartographic analysis, and its development is considered possible but not necessarily probable (as opposed to land that is already planned or platted which is considered probable and reasonably foreseeable, regardless of the proposed project). The developable land is not necessarily causally connected to the proposed roadway project. Potential development at intersections with existing roadways is the most likely to occur in conjunction with the proposed project. Nonetheless, cartographic techniques were used to assess the sensitive resources that could be found within that developable land area. This analysis is followed by a discussion of the minimization and mitigation tools that would apply to development proposed by others in those areas.

7.2 Access Alteration

Sometimes referred to as the induced growth effect, Access Alteration was analyzed for potential indirect impacts. Transportation projects may provide new or improved access to adjacent land, or may induce development on surrounding land by effecting a reduction in the time-cost of travel (NCHRP 2002). Transportation projects may also affect the rate at which planned development is implemented. Access alteration is closely linked to induced growth and potential impacts that could occur in those growth areas. Complementary development could occur near SH 45SW access points at FM 1626 and MoPac, and at Bliss Spillar Road, where land is not already developed. In their questionnaire responses, local planning experts cited the large amount of preserved lands in the AOI (primarily COA Water Quality Protection Lands or WQPLs) as a constraint on the amount of development the project could be expected to induce. Further information from the questionnaire responses is included in **Section 7.3.3**.

To identify areas where potential effects of project-influenced development might occur in the AOI, data on existing and planned developments were analyzed to determine areas of vacant land that could be developed in the future. Land use, zoning, and tax code information were analyzed using GIS techniques and verified with aerial photo interpretation to determine areas of vacant land within the AOI. Currently developed lands and roadways were also subtracted from the amount of available developable land. Preserved lands (including parks, open space, and WQPLs) and vacant land within the 100-year floodplain were classified as undevelopable. **Figure 7-1** shows developable land within the AOI.

Figure 7-1: Developable Land in the AOI



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7.3 Indirect Effects Potentially Resulting from Induced Growth

The potential effects resulting from induced growth are discussed in this section based on cartographic analysis, a discussion of impacts by sensitive resource according to team technical experts, and a summary of questionnaire responses gathered from planning and resource agencies.

7.3.1 Cartographic Analysis

Some changes in land use could occur within the AOI if undeveloped areas are developed - in part - as a result of enhanced access to previously undeveloped land. To determine the potential for induced growth, existing land uses within the AOI were quantified (see **Table 7-1**). **Figure 7-1** shows land within the AOI depicted as developed, available for development, or other lands considered to be undevelopable such as parks, WQPLs, and preserves.

Within the 41,674 total acres of the AOI, approximately 16,724.6 acres (40.1 percent) are already developed (including roadways, state-owned right-of-way (ROW), and other developed land). Approximately 11,584.7 acres (28.4 percent) are undevelopable including parks, floodplains, and WQPLs. Within the AOI, WQPLs (both those owned outright by the COA and those which have conservation easements placed on them) account for 7,741.8 acres (18.6 percent). WQPLs have been protected from development in perpetuity and COA notes that water or wastewater service will not be extended to any lands that belong to the COA or have conservation easements on them. Floodplains cover 1,548.4 acres of the vacant land within the AOI.

Table 7-1: Acres of Land Available for Project-Influenced Development within AOI

Existing Land Uses	Acres	Percentage of Total
Total Developed Land	**16,724.6**	**40.1%**
Transportation (Roads, ROW)	*1,578.0*	*3.8%*
State-Owned ROW	*311.6*	*0.7%*
Other Developed Land	*14,835.0*	*35.6%*
Undevelopable Land	**11,584.7**	**28.4%**
Parks or Open Space	*2,564.5*	*6.2%*
Water Quality Protection Lands	*7,741.8*	*18.6%*
Floodplains (in developable land)	*1,548.4*	*3.7%*
Developable Land within AOI	**13,094.5**	**31.4%**
Agricultural Land (without floodplains)	*767.9*	1.8%
*Planned Projects within Developable Land within AOI**	*3,707.2*	8.9%
Developable Land Minus Planned Projects within AOI	*9,387.3*	22.5%
Total Area within AOI	**41,673.8**	**100.0%**

Source: CPY, Blanton, and CMEC, 2014.
See **Table 7-2 for Planned Projects within the AOI.*

Based on information provided by the jurisdictions located within the AOI, several projects are in various stages of development, ranging from under review to under construction. Removing these projects from the stock of developable land in the AOI yields approximately 9,387.3 acres available for future development (22.5 percent of the AOI). A list of these in-progress developments is included in **Table 7-2**. Individual developments are detailed in **Attachment 2**.

Table 7-2: Planned Projects on Developable Land within AOI

Development Project in AOI (entity)	Approximate Acres
Emerging Projects on Vacant Land (City of Austin)	1,325.8
Boone-Heep Development (Travis County TNR)	334
Giberson Commercial/MU (Buda)	81
SF development (Buda)	10
SF development (450 ac 80% complete) (Buda)	90
Potential School on 967 (Hays CISD)	100
Potential School in area (location TBD) (AISD)	100
O Bar Ranch (Hays Co)	1,500
City of Hays Development	166.4
Total Planned Projects (approximation)	*3,707.2*

*Source: COA, 2013; Questionnaire Respondents, see **Table 7-4***

7.3.2 Technical Analysis of Sensitive Resources

Within the 9,387.3 acres available for development in the AOI, various resources could potentially be affected should development be proposed in the future by others. These resources are discussed in the following sections.

Threatened and Endangered Species

Austin blind and Barton Springs salamanders

Water quality degradation is identified as a threat to both the Austin Blind salamander (USFWS, 2013) and the Barton Springs salamander (USFWS, 2005). The Barton Springs salamander Recovery Plan identifies dissolved oxygen, conductivity, sediments, metals, nutrients, pesticides, and hydrocarbons (including PAHs) as key water quality parameters of concern. To reduce potential water quality threats, TxDOT would agree to abstain from the use of pesticides (including herbicides) in conjunction with the maintenance of the proposed SH 45SW. Many of the other parameters listed are inter-related, and mitigation efforts can affect them broadly.

Due to the nature of water and the way it travels, indirect impacts must be considered in terms of whether impacts could occur farther in time or distance. However, the potential for indirect impacts is connected to the potential for direct impacts. Specifically within the project area, BMPs would be used during construction and operation of the SH 45SW project to minimize and avoid impacts to water quality, and thus impacts to the salamander species that rely on the quantity and quality of groundwater in the aquifer. Engineered water quality protection features would be designed in accordance with the Edwards Aquifer Rules to offset the increase in impervious cover and any potential increase of roadway contaminants. For the majority of the proposed roadway, PFC and water quality ponds are currently proposed for a minimum of two levels of treatment. In most areas, additional vegetated swales/filter strips would provide a third level of treatment. Additionally, a substantial portion of the design would have grassy swales which would provide a fourth level of treatment. In areas where permeable friction-course (PFC) is not appropriate (e.g. bridges and direct connectors), stormwater would be drained through a collection system into water quality ponds for treatment.

Studies of vegetative control measures such as vegetative filter strips (VFS) and grassy swales have shown that VFS can remove up to 97 percent of total suspended solids (TSS) and up to 99 percent of metals (Barrett, 2004). The use of porous asphalt overlays (also known as PFC overlays), which were initially intended to improve aspects of traffic noise and wet weather visibility, has proven to yield water quality benefits as well. Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008) can be removed from highway runoff as it passes through these permeable

road layers. The use of these and other water quality control measures can substantially reduce pollutant loading associated with highway stormwater runoff. When design constraints allow, these water quality tools can be used in series to further reduce pollutant loading in highway stormwater runoff.

Because of the engineered BMPs that would allow for the removal of at least 90 percent of the incremental increase in TSS load over the Recharge Zone, the distance from the proposed project to Barton Springs, and the relatively small amount of stormwater that would recharge from the project area to the Edwards Aquifer, no adverse impact to springs would be expected with the proposed project. Based on analyses of stormwater runoff associated with the Build Alternative, TSS load from the proposed project would be less than existing conditions, resulting in higher quality water recharging to the aquifer and discharging at springs. For portions of the proposed project over the Recharge Zone, an approximate 21.7 percent reduction of the existing TSS load would be achieved through treatment and BMPs. The BMPs proposed for this project also remove a variety of other pollutants such as nutrients, oil and grease, and metals. Some traffic would be diverted from older roadways that have fewer BMPs in place to minimize water quality impacts when compared to the BMPs proposed for SH 45SW (HNTB 2014).

TSS is often used in regulatory frameworks as a water quality parameter that may act as a surrogate parameter or design parameter because its concentration may indicate broader water quality. This is due in part to the occurrence of some pollutants as particles and also to the tendency for other pollutants to adsorb to particles. TSS is related to each of the parameters of concern identified for the Barton Springs salamander. TSS, as a design parameter, can include many constituents, and these constituents may vary by source. For instance, constituents found in agricultural runoff, roadway runoff, and grassland runoff may differ in the types and relative amounts of constituents present. Barrett and others (1995b) and Geismar (2000) point out that metals, hydrocarbons, chlorinated pesticides, and polychloronated biphenyl (PCB) are hydrophobic constituents that adsorb to sediment particles. Sediment-associated pollutants can also introduce an oxygen demand and influence conductivity (USFWS, 2005). A design goal of the proposed project was to achieve, at a minimum, a 90 percent reduction in the expected TSS load for portion of the project that are over the Edwards Aquifer Recharge Zone. The proposed system of BMPs would exceed the design goal and reduce the expected incremental increase in TSS loads by approximately 104.8 percent over the Edwards Aquifer Recharge Zone.

Roadway runoff may have elevated amounts of heavy metal constituents that can induce toxic effects in aquatic environments (Kearfott et al. 2005). Lead is a roadway-associated heavy metal that may be strongly adsorbed to particles while others such as Zinc, Cadmium, and Copper may be largely dissolved (Sansalone et al. 1998). Each of the elements in the proposed system of BMPs has been shown to reduce concentrations of both adsorbed and dissolved heavy metal constituents (see ***Water Quality and Aquatic Resource Protection Technical***

Report in **Appendix H** for more detailed discussion). TCEQ Surface Water Quality Standards establish concentrations of potentially toxic constituents, including heavy metals, below which aquatic life should be protected (30 TAC 307). Aquatic life protection standards of many heavy metals are determined based on the hardness of the waterbody being sampled with toxicity decreasing as water hardness increases. Formula for these standards can be found in Table 1 of 30 TAC 307.6(c)(1). Water discharged at Barton Springs is classified as very hard (USFWS, 1992). Therefore, possible effects of heavy metal constituents would be reduced by the use of BMPs and further diminished by natural chemical processes.

The Build Alternative would run near Flint Ridge Cave. However, with the proposed design, no runoff from disturbed areas would enter the cave. The roadway design was revised in fall 2014 to move even farther from FRC, thus reducing the encroachment on the FRC drainage area (**Appendix C** of the FEIS).

A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom of the rail. These inlets would be connected to an underground storm sewer system which would outfall into the water quality pond located under the Bear Creek north bridge abutment. No untreated runoff associated with the roadway would enter FRC or its surface watershed. The size of the FRC watershed would be maintained.

According to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties* (TxDOT, SWCA, and Cambrian, 2014), "owing to the size and depth of Flint Ridge Cave and maintenance of its surface drainage area, construction of SH 45SW is expected to have a negligible effect on the current ecological integrity of the feature, so it is expected that the karst faunal community inhabiting the cave will be unaffected by construction and use of the roadway."

During construction of the proposed project, there is a potential for leakage of fuels. Accidental spills could occur during operation of the roadway; however, studies indicate that the chances of contaminated water from a spill reaching Barton Springs is unlikely due in part to proposed project drainage controls (retaining wall, roadside ditch, hazardous material traps and valves on batch detention ponds). Spills on the roadway or along the roadside would be cleaned up to background levels (TxDOT, 2014). Potential adverse effects of these actions are also minimized by implementation of a Water Pollution Abatement Plan (WPAP) and Stormwater Pollution Prevention Plan (SW3P). There are several relevant points with regard to dilution of pollutants in the groundwater:

- The COA "has enacted policies and made significant investments in the protection of water quality in the Barton Springs Zone of the Edwards Aquifer."
- One measure taken includes "Implementation of the citizen-initiated Save Our Springs ordinance, which limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites in the Barton Springs Zone" (COA, 2011).

- The discharge from the project would be compliant with TCEQ water quality thresholds (at least 80 percent post-construction TSS removal). The project and discharge also would not exceed the COA non-degradation standards for impervious cover.

- The use of PFC overlays has proven to yield water quality benefits. Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008) can be removed from highway runoff as it passes through these permeable road layers.

- Based on groundwater quality information, groundwater quality has fluctuated based on rainfall and anthropogenic activities, but has remained relatively stable over time (Mahler 2006, Slade 1986).

- Groundwater is also diluted as it proceeds from the proposed project onward to the closest salamander habitat (Barton Springs), which is over nine miles to the north from the proposed project. In addition, due to the fact that this is strictly a roadway with no frontage roads and WQPLs are adjacent to approximately 40 percent of the proposed roadway, it is assumed that a minimal amount of pollutants would enter the groundwater.

The new SH 45SW roadway could allow access into previously inaccessible areas which could in turn result in development. Based on the cartographic analysis discussed in **Section 7.3.1**, approximately 13,095 acres, or 31 percent of the AOI, consists of developable land (including land planned for development).

Within the areas available for development in the AOI, land disturbing activities such as grading, construction of bridges and culverts, drainage easement grading and shaping, and other construction activities for a project of this size would require coordination with the TCEQ. A WPAP in compliance with the Edwards Aquifer Rules and a SW3P in compliance with Texas Pollutant Discharge Elimination System (TPDES) would be submitted for TCEQ review and approval. These documents specify the BMPs incorporated into the project to prevent erosion and sedimentation during construction, as well as post-construction TSS controls. TCEQ's Edwards Rules provide that affected cities, counties and groundwater conservation districts may review and comment on the WPAP application when it is filed, thus there will be a public participation opportunity at that time (30 TAC 213.4 (a) (2)).

All development within the Edward's Aquifer in the AOI is subject to the State's Edwards Aquifer Rules, the goal of which is non-degradation of existing groundwater quality (30 TAC 213.1). Moreover, a large portion of the AOI (9,576 acres) lies within the jurisdiction of the COA, which has enacted water quality ordinances; further limiting development intensity.

In its final rule to list the Barton Springs salamander as endangered, USFWS acknowledges that "[g]enerally, new development and construction designed and implemented pursuant to State and local water quality protection regulations in effect as of the date of this

rule will not result in a violation of section 9 [of the ESA]." EPA affirmed this finding when it approved Texas' application to administer NPDES. EPA states:

> "After careful consideration in formal consultation, FWS concluded in a biological opinion that approving the TPDES program is unlikely to jeopardize listed species if applicable water quality standards are fully applied in TPDES permits, despite some loss of federal authority in some situations. With FWS assistance, EPA will use its oversight procedures to assure the standards are in fact applied, particularly in waters on which listed species depend. This effort will result in more attention, particularly of minor state permit actions, than EPA devotes to oversight of any other state NPDES program in Region 6. Both EPA and FWS are additionally committed to seeking even more protection for listed species by continuing to consider their needs in EPA's review of revisions to Texas' water quality standards. Region 6 believes these actions will increase the overall protection CWA affords listed species in Texas."

Construction projects in the Edwards Aquifer Recharge Zone within the AOI would be subject to the Edwards Aquifer Rules and TPDES. Assuming appropriate implementation of applicable land use planning regulations and local development ordinances and compliance with local, state, and federal laws and regulations, any substantial effects to the quality and quantity of Edwards Aquifer recharge from development within the AOI would be avoided or minimized.

For all these reasons, no impacts to the Austin blind salamander and Barton Springs salamander are anticipated.

In addition, the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties* (TxDOT, SWCA, and Cambrian, 2014) discusses the potential for indirect impacts to critical habitat for the Austin blind salamander. The analysis concludes that "it can be expected that the quality and quantity of water discharging at Barton Springs would remain at levels suitable for sustaining Austin blind salamanders and their prey base…construction of SH 45SW does not appear to create potential to adversely modify the critical habitat that has been designated for the Austin blind salamander."

Golden-cheeked Warbler

Indirect impacts to the Golden-cheeked Warbler could occur through induced growth within the AOI. Based on currently available data (Texas A&M 2010), there are an estimated 13,275 acres of potential Golden-cheeked Warbler habitat within the AOI, approximately 13,217 acres of which fall outside of the proposed project ROW and thus have the potential to be indirectly impacted. However, 4,427 acres of this potential habitat, or 33 percent of it, fall within COA WQPLs and are therefore protected from further development. Approximately 447 acres of potential habitat is located on land for which developments have been proposed or are being constructed. Estimates of induced growth show that the potential exists for a maximum of 4,102

acres of potential Warbler habitat to be lost if that land was developed over the planning horizon. This acreage represents approximately 31 percent of the potential habitat available within the AOI. The remainder of potential Golden-cheeked Warbler habitat, approximately 4,241 acres or the remaining 32 percent of the AOI, falls on land that has been classified as "undevelopable." Land can be classified as undevelopable for a number of reasons, including it designation as park land and in effect, these lands are likely to continue to serve as habitat in perpetuity. All developers are subject to the Endangered Species Act and developments that fall within the BCCP or Hays County RHCP could utilize those regional habitat conservation plans as vehicles for compliance with the ESA. Therefore, it is unlikely that the maximum amount of developable habitat would in fact be converted to developed uses given that mitigation for impacts to habitat is required and some of the land that would be preserved in mitigation is likely to already be identified as potential habitat that falls within the AOI.

Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, no impacts to this species from the proposed project are anticipated.

Additional analysis of Indirect Effects is discussed in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (TxDOT, SWCA, and Cambrian Environmental 2014). Potential types of indirect effects to Golden-cheeked Warbler habitat include habitat loss, reduction in habitat patch size, habitat fragmentation, increase in predation rates, increase in cowbird parasitism rates, and change in woodland structure and species composition. Each of these types of indirect effects is discussed in the report and the report concludes that "no indirect impacts to Golden-cheeked Warblers would be expected to result from construction and use of SH 45SW." In addition, "the reduction in the amount of woodland cover present on the landscape as a result of clearing of the SH 45SW right-of-way is not expected to alter the frequency at which Golden-cheeked Warblers occur on City of Austin Water Quality Protection Lands."

Edwards Aquifer/Groundwater Resources

Developable lands in the AOI occur in the Contributing, Recharge, Transition, Contributing with Transition, and Saline Zones (**Table 7-3**). Should these lands be developed, potential effects to groundwater resources include short-term potential for pollutants in stormwater runoff from the construction site of any future development of undeveloped lands to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; long-term potential for pollutants in stormwater runoff from any future roadways constructed in support of future development of undeveloped lands, including from

catastrophic spills, to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; and potential for reductions in recharge to the Edwards Aquifer resulting from increases in impervious cover caused by future development of undeveloped lands. However, these impacts would be substantially reduced to acceptable levels by compliance with TCEQ's Edwards Aquifer Rules and COA ordinances, as applicable.

Table 7-3: Edwards Aquifer Zones in Developable Land within Area of Influence

Edwards Aquifer Zone	Area in Developable Land within the AOI (acres)	Percent of Each Zone in Developable Land within AOI
Contributing Zone	2,756	21.0%
Recharge Zone	5,764	44.0%
Transition Zone	1,936	14.8%
Contributing Zone within Transition Zone	179	1.4%
Saline Zone (outside potable zone of Edwards Aquifer)	2,460	18.8%
Total	13,095	100%

Source: Blanton, 2014.

Surface Water

In general, effects to surface water quality can occur due to: 1) increased impervious surface area (which could result in increased runoff, alter recharge (flow and quality) into the aquifer, and decrease water quality downstream); and 2) grading and removal of during construction, which could accelerate erosion due to stormwater runoff. The ROW for the proposed project is approximately 312 acres, roughly 0.7 percent of the 41,674 acres in the AOI. There are 66 linear miles of creeks in the AOI including Danz Creek, Slaughter Creek, Bear Creek, Little Bear Creek, Garlic Creek, and Onion Creek (a TPWD ecologically significant stream segment). Within the 41,674 acres in the AOI, approximately 19 percent of the AOI consists of protected WQPLs, six percent is parks or open space, four percent is in floodplains/CWQZs. In addition, projects in the City of Austin's Water Quality Transition Zones (WQTZs) trigger COA compliance with environmental regulations and where the Save Our Springs Ordinance applies, additional water quality protections would be in place. Indirect impacts to surface waters are not expected in these areas.

Given that Section 401 and Section 404 requirements under the Clean Water Act are generally applicable to public and private developments, as well as additional protections and permitting requirements over the Edwards Aquifer Recharge Zone and those promulgated by municipalities for local protection, indirect impacts from induced growth (development by others) to surface water resources are not expected to be substantial. However, because surface water features are located in the AOI and convey water into groundwater recharge features, the resource will be carried forward to cumulative impacts analysis.

7.3.3 Planning Expert Questionnaire and Responses

A questionnaire was sent to agencies, organizations, governmental jurisdictions, and water supply corporations within the project's AOI. Points of contact at each organization were contacted by telephone prior to the questionnaire being sent. The questionnaire and AOI map (**Attachment 1**) were emailed to each organization listed in **Table 7-4** on November 25, 2013. Follow up telephone calls and emails were sent to those organizations that had not replied by December 16, 2013. Additional research was conducted in April 2014 for parcels adjacent to access points. Those results are discussed after the questionnaire process and results.

The questions were designed to identify available resources and to solicit input concerning how the project might affect growth and development within the region. In addition to identifying available information and data, the questionnaire specifically focused on how each agency or organization viewed the potential impacts of the project. See **Attachment 1** for the contact letter form. The full text of all received responses is available for review in the project files at TxDOT Austin District.

Table 7-4: Indirect & Cumulative Effects Questionnaire Respondents

Organization	Primary Point of Contact	Response Received*
City of Austin	Mike Personett, Watershed Protection Dept Assistant Director	12/18/2013
City of Buda	Chance Sparks, Planning Director	11/27/2013
City of Dripping Springs	Jon Thompson, Planning Director	
Travis Co TNR	Wendy Connally, Natural Resources Program Manager	12/17/2013
Hays Co Devel Services Dept	Clint Garza, Hays County Development Services Dept Director	12/20/2013
Hays City	Michael Warnken, Mayor	
City of Mountain City	Tiffany Cumutt, Mayor	
Village of San Leanna	Kathleen Lessing, Village Administrator	
AISD	Paul Turner, Executive Director of Facilities	12/19/2013
Hays CISD	Rod Walls, Director of Facilities and New Construction	12/5/2013
Capital Metro	John-Michael Cortez, Community Involvement Manager	
CAMPO	Lisa Weston, Senior Planner	12/17/2013
CAPCOG	Michael Hennig, Director of Community & Economic Development	
BSEACD	Vanessa Escobar, Regulatory Compliance Coordinator	12/13/2013
LCRA	Jarrod Depew, Natural Resource Conservation Coordinator	
Hays Trinity GCD	Rick Broun, General Manager	
Shady Hollow MUD	Valerie Wheeler, General Manager	
Creedmoor-Maha WSC	Charles Laws, General Manager	12/5/2013
Arroyo Doble Water Supply Inc	Norma Grubert, Owner	
Aqua Texas Inc	Brent Reeh, Area Manager	11/27/2013
Slaughter Creek Acres WSC	Mike Dorsey, Board Member	11/25/2013
Cimarron Park Water Co	Byron Townsend, President	11/25/2013
Goldenwood West WSC	Patrick King, PGMS Manager	
Mystic Oak Water Supply Inc	Constance Norwood, Officer	
Oak Forest WSC	Phil Suitt, President	
West Travis County Public Utility	Don Rauschuber, General Manager	

*Source: CP&Y, 2014. Note:*Blank cells are still waiting for responses.*

Several respondents expect the proposed project to influence the amount and pace of development in the area, but acknowledge the difficulty in determining to what extent the project would specifically affect development, given the already high rate of growth in the Austin area

overall. The City of Austin states the point succinctly: while the project "could provide an incentive for development to locate outside of Austin that otherwise would have located within Austin City Limits…the project's impact on the overall rate of land development within Austin would likely be minimal given the overall size and growth rate of Austin." Travis County pointed out that, "[w]ith this high rate of growth [occurring in surrounding counties like Hays], it would be hard to determine if resulting growth is in response to a project or the current population trend occurring within the region."

All respondents pointed to the large amount of preserved lands (including WQPLs and conservation easements) in the area as a limiting factor on the amount of development that could be generated by the project. Additionally, respondents provided information on several residential and commercial developments that are underway or planned for the area, yet few capital improvement projects were named. This factor, combined with the fact that most water supply corporations contacted had no plans to extend water service, suggests that infrastructure may also be a limiting factor, constraining the amount of growth possible in the area. Respondents also provided information on reasonably foreseeable future developments, which are summarized in the ***Cumulative Impacts Technical Report***.

Common Threads from Survey Responses:

- Project would influence amount/pace of development, but it is hard to say to what extent, due to high growth in Austin in general;
- Preserved lands (WQPLs, conservation easements) in area limit how much of AOI can be developed;
- Several residential, commercial, and civic developments are underway or are planned for the area, although not many capital improvements are planned;
- Water quality/availability is a limiting factor – impervious cover rules, BSEACD pumping regulations, ESA considerations are all cited as constraints on development;
- Limited access nature of roadway minimizes development that can occur along roadway;
- Project anticipated to relieve traffic congestion on Brodie, Manchaca, Slaughter, FM 1626;
- Project anticipated to be used most heavily by regional drivers.

Other Main Points made by Survey Respondents:

City of Austin

Project can be expected to affect the amount and rate of development in the area, but this effect would be minimal/mitigated by:

- Austin's overall high growth rate

- Preserve lands owned by COA
- Floodplains
- Potential stormwater management areas
- No capital improvement projects are planned for the area, with the exception of utility services to be extended to the Shady Hollow area upon its annexation
- Project is not in accordance with local comprehensive plan (COA, 2010)
- Undeveloped parcels outside COA's ownership could be expected to develop as a result of the project as project could provide a development incentive through reduction in travel times

Travis County TNR

- Due to the Austin area's high rate of growth, it would be difficult to determine whether growth in the area occurring after the proposed project is built is the result of the project specifically or part of the current wider growth trend
- Due to the limited access nature of the roadway, parcels that could be expected to develop would be confined to the three access points (MoPac, FM 1626, and Bliss Spillar Road)
    - The type of development occurring at Bliss Spillar Road would probably be influenced by the type of intersection decided upon (commercial vs residential)
- There are several ongoing or planned roadway projects in the AOI (FM 1626, Frate Barker Road, Manchaca Road, Old San Antonio Road bridge, proposed Escarpment Blvd extension into Hays County)
- Factors limiting growth include:
    - Floodplains
    - Protected lands (WQPLs, Hill Country Conservancy conservation easements, BCCP habitat zones)
    - ESA considerations (pertaining to karst invertebrates & salamanders)
    - Water availability
    - BCCP protection for drainage areas of mitigation caves (like Flint Ridge Cave)
- Limited access nature of roadway means it would probably be utilized mainly by regional/through traffic between Hays and Travis counties

Hays CISD

- Potential site for new high school/educational facility on RM 967 just west of FM 1626 (~100 acres)
    - No current plans for development of this site

- Roadway would probably be used by travelers who currently take IH 35 or FM 1626 north
- Project would likely affect rate of development in AOI

Hays County

- Project would have stimulatory effect on rate of development
  - Area struggles with limited connectivity: only three developments are anticipated in the AOI at this time
- Not aware of any capital improvement projects outside the Boone-Heep and Avana developments and potential Hays CISD facility
- Preserved lands as factor that would limit development
- Roadway would be used by Hays County residents accessing Austin; expect this to lessen congestion on local arterials (Brodie, Manchaca, FM 1626)

BSEACD

- By providing improvements in mobility, project may lead to an increase in development, although to what extent is unclear
- FM 1626 improvements ongoing throughout AOI
- WQPLs and conservation easements could be limiting factors to growth
- Roadway would be utilized by regional commuters who currently access Austin via IH 35, Brodie, Manchaca, S. 1st, and FM 1626

CAMPO

- Traffic study published December 2013 showed that the build scenarios (tolled and non-tolled two- and four- lane roadways on state-owned ROW) resulted in:
  - Travel time reductions of 2-3 min from Hays to Travis and vice versa at AM peak periods
  - Route length reductions of 1-2 miles from Hays to Travis at AM peak periods
  - Route length reductions of 1.5 miles from Travis to Hays at AM peak periods
- Primary findings of the study:
  - Improved connectivity under the build scenarios improves travel for drivers headed north from Hays to Travis counties
  - Many northbound roads in the area are expected to experience moderate relief in traffic over the no build scenario in 2025; this doesn't necessarily mean reduced travel times, however.

AISD

- Project expected to relieve traffic on Brodie and Manchaca
- A future high school requiring 50-100 acres is anticipated for south Austin; however, the site of this school has yet to be determined
- Roadway would be used by both local and regional traffic
- AISD is concerned about potential access issues stemming from school buses' inability to utilize a tolled facility
    - Baranoff Elementary and Bailey Middle busing issues reaching students on south MoPac
    - Conversely, being able to access the facility would make reaching students on Bliss Spillar Road more efficient
- Limiting factors to growth:
    - COA Proposition 2 lands (WQPLs)
    - COA impervious cover restrictions

City of Buda

- Project is not anticipated to increase the amount or rate of development in respondent's jurisdiction
- Several developments are ongoing or planned for the FM 1626-RM 967 intersection that would occur regardless of the construction of the proposed project
- Roadway expected to significantly improve travel times by providing an effective alternative to IH 35
- Dahlstrom Ranch conservation easement a limiting factor to development in area

Aqua Texas WSC

- Service area largely built out, but project could result in additional development, depending on developer interest
- No expansion projects planned for service area

Creedmoor-Maha WSC

- Service area still has lots of room for development
- Project anticipated to influence amount/rate of development

Cimarron Park WSC

- Service area largely built out
- Project expected to impact development in the wider AOI

Slaughter Creek WSC

- Service area largely built out
- Project expected to influence development along FM 1626 in areas that are currently sparsely developed (between Brodie Ln and RM 967)

Overall, respondents acknowledge that the Austin area is experiencing high rates of growth and development and point out that while they expect the proposed project to have some effect on the timing of development in the AOI, the project's impact on the area's rate of growth would likely be minimal, given the strength of current overall development trends.

Additional investigations at transportation access points:

Additional investigations were conducted at the access points to SH 45SW. There are three access points to SH 45SW: MoPac, Bliss Spillar Road, and FM 1626. There are several parcels at SH 45SW and MoPac; SH 45SW and Bliss Spillar Road (some of which appear to have common owners); and SH 45SW and FM 1626 that are developable or contain a residential structure on a large lot. Project staff contacted the planning entities with jurisdiction over these areas to determine whether or not there were planned or platted developments on these parcels. The following information was obtained via personal communications.

Hays County Development Services department stated that there are no recent plats or site plans associated with various parcels located near Bliss Spillar Road and SH 45SW. One six-acre parcel and another 159-acre parcel are not currently planned or platted for development. There are two parcels near FM 1626 that are not currently planned or platted for development: one totals 12 acres and the other is an 84-acre parcel.

Hays County Development Services department stated that nothing is planned or platted on a 208-acre parcel southwest of SH 45SW. However, additional information was provided to the State indicating that some land in this particular area is proposed for development. Depending on the available base mapping (there are parcels showing slightly different acreage information), four parcels are proposed for development southwest of SH 45SW and Bliss Spillar Road. The parcels are 156.6 acres, four acres, two acres, and 50.3 acres for a total of 214.8 acres. Proposed land uses would be retail (approximately 200,000 sq. ft.) and multi-family (525 units) (Pers. Comm. Hill Country Conservancy and CTRMA, April 2014). In addition, this developer potentially proposes to dedicate 113 acres of parkland off of FM 1626 in association with the proposed developments. Additional conversations between the landowner and the project team indicate that Hill Country Conservancy (HCC) is considering purchasing certain parcels for conservation, which would potentially direct development to occur at other locations in the AOI. Overall, there is potential for both development and conservation to occur at various parcels in the general location of SH 45SW and Bliss Spillar Road. At the intersection of SH 45SW and MoPac, there is a property to the east side of the intersection that appears to be developable, but no plat information was available.

The Greyrock Ridge Subdivision (shown on the Table in **Attachment 2**) consists of approximately 55 acres that are planned for residential development. Approximately 36 acres immediately north of the Greyrock Ridge development have been approved for an office development, although no construction had started as of April 2014. This area is to the west/southwest of the intersection of SH 45SW and MoPac. At the northern intersection of SH 45SW and MoPac, there is a concept plan for a commercial or office development but it is not known to be platted at this stage.

Several small adjacent parcels at access points that fall within Travis County do not appear to be proposed for development, based on GIS data obtained from Travis County. Travis County staff did not return requests for verification for development status by the date of this publication.

Developments in these areas may occur at a slightly more rapid pace when compared to other developable land in the AOI since they are connected to SH 45SW via access points.

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8.0 MINIMIZATION AND MITIGATION

Numerous minimization and mitigation measures are in place that would apply to any developer that proposes to build in the AOI. In addition, there are a variety of land development requirements that are in place at the municipal level that would also apply to developers in those jurisdictions. These are discussed by resource below.

8.1 Threatened and Endangered Species

8.1.1 Golden-cheeked Warbler

The Golden-cheeked Warbler (*Setophaga chrysoparia)* is one of the species addressed in the BCCP (COA & Travis County, 1996). The BCCP was a plan written by COA and Travis County in order to obtain an incidental take permit for Golden-cheeked Warblers, Black-capped Vireos, and six species of federally-endangered karst invertebrates under section 10(a)(1)(B) of the ESA. The take covered by the permit would include take associated with grading, clearing, or other earth-moving activities necessary for residential, commercial, or industrial development and infrastructure projects as well as indirect impacts, such as noise, predation, and harassment from the occupancy and use of these structures. As a part of the BCCP, approximately 30,428 acres of Golden-cheeked Warbler and Black-capped Vireo habitat will be protected within a preserve system called the Balcones Canyonlands Preserve (BCP). The habitat protected by the BCP is considered to be some of the highest quality and least fragmented habitat of any county in the Golden-cheeked Warbler's range. Areas covered by the BCCP in the event of incidental take include all of Travis County with the following exceptions: the BCP, portions of the Balcones Canyonlands National Wildlife Refuge (BCNWR) that fall within Travis County, and areas within city limits and planning jurisdictions of municipalities that are not participating in the BCCP. The permit will last for 30 years (COA & Travis County, 1996). The BCCP is a permitting mechanism for compliance with the ESA, and is one potential compliance avenue for development projects that apply and are deemed eligible to participate in the BCCP. TxDOT is investigating the possibility of participating in the BCCP as a voluntary conservation benefit, although no impact to Golden-cheeked Warbler is anticipated as a result of the proposed project.

The Golden-cheeked Warblers are protected from all unauthorized take by the ESA, which would require future developers to participate in mitigation programs such as the BCCP and Hays County HCP and/or coordinate with the USFWS if their projects are determined to impact Golden-cheeked Warbler populations or habitat. Under Section 9 of the ESA, it is unlawful for any person subject to the jurisdiction of US law to import, posses, sell, deliver, carry, transport, ship, deliver, receive, carry, or take any species designated for protection under the ESA. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (ESA, 1973). Therefore, while there could be

future impacts to Golden-cheeked Warbler habitat from growth within the area, it would in all likelihood be mitigated for and the species would continue to be protected under the laws and conservation plans that have been put into place. Furthermore, Golden-cheeked Warblers are protected under TPWD regulations and the Migratory Bird Treaty Act (MBTA) (TPWD Code, Chapters 67 and 68, and Section 65.171-65.176 of Title 31 of the Texas Administrative Code (TAC); MBTA, 1918). However, these acts only protect the birds themselves and do not extend protection to habitat. These regulations would provide protection to areas where Golden-cheeked Warblers activity is known to currently be occurring during the breeding and nesting season, preventing disturbance to active nests, eggs, and young as well as the breeding adults.

8.1.2 Barton Springs Salamander and Austin Blind Salamander

The project would use BMPs that would allow for a TSS removal rate of at least 90 percent of the incremental increase in TSS load over the Recharge Zone. During construction, the BMPs would include erosion controls and sediment controls. The completed project would include facilities to collect and treat runoff prior to discharging it off site. The project would comply with the TCEQ's Edwards Aquifer Rules (including preparation of a WPAP), and would comply with the TPDES standards (through preparation of a SW3P). Further, the project is nine miles from Barton Springs. Given all of these facts, the TSS load on the aquifer and Barton Springs would be less than under the No Build Alternative. This shows the project would not result in an impact of the species and their habitat.

Examples of BMPs that could be used during project construction include mulch logs, rock filter dams, and silt fences, which are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report***. Potential hazardous material removal would be addressed through the use of several structural and non-structural BMPs, including the placement of hazardous materials traps at key locations. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series with each in the line removing additional TSS and other pollutants. Pollutant removal rates through these "stacked" BMPs can exceed 90 percent, as discussed in the ***Water Quality and Aquatic Resource Protection Technical Report*.**

Projects moving forward as a result of induced growth from the proposed project would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs salamander or the Austin blind salamander or their habitat. The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (ESA, 1973). The Barton Springs salamander and the Austin blind salamander are not species listed for coverage under the BCCP or the Hays County HCP. However, land set aside for the BCCP protects groundwater quality in the Barton Springs segment of the Edwards Aquifer, which indirectly benefits the salamanders. Land protected for Golden-cheeked Warblers in Hays County also would protect water quality to the extent that development does not occur. Furthermore, the COA has set aside more than 26,000 acres of

WQPLs specifically to protect the water quality within the Edwards Aquifer, which will also indirectly benefit and protect the Austin blind salamander and the Barton Springs salamander. These existing protections will help to mitigate for future impacts to the listed salamander species.

8.2 Edwards Aquifer/Groundwater Resources

Mitigation for potential water quality impacts occurs in the form of regulations and ordinances. Two agencies – the TCEQ and the BSEACD – share responsibility for protecting the Barton Springs segment of the Edwards Aquifer. The individual and combined effect of these regulatory programs is to protect water quality and/or mitigate the adverse effects to water quality from development activities.

TCEQ regulations to protect the Edwards Aquifer are contained in the *Edwards Aquifer Rules* (30 TAC 213). These rules require developers who are planning to construct on the Recharge Zone or portions of the Contributing Zone of the Edwards Aquifer to prepare and submit an aquifer protection plan to the TCEQ for review and approval. This plan must include a Geologic Assessment describing site-specific geology and identifying all potential pathways for contaminant movement to the Edwards Aquifer. The rules require the use of permanent stormwater BMPs that are able to remove 80 percent of the incremental increase of total suspended solids in runoff from the site. No additional permanent BMPs are required for single-family residential developments that are 20 percent or less impervious cover. Additionally, the TCEQ has issued two optional guidance documents, *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer* and *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates*. These documents provide optional enhanced water quality measures and BMPs for protecting the Edwards Aquifer that may be implemented in areas subject to the *Edwards Aquifer Rules*. The optional enhanced measures are consistent with the TCEQ's goal of non-degradation of groundwater quality and may be used to further protect the Edwards Aquifer, including public health and welfare, terrestrial and aquatic life, and the environment (TCEQ 2007).

Examples of BMPs that could be used during project construction include pre-construction planning to avoid harm to known sensitive features (such as the re-alignment that occurred in the Fall of 2014 to reduce impacts to the Flint Ridge Cave surface drainage); construction phase sensitive feature protection measures; accidental void discovery protocols; and void mitigation as described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report***.

Water quality at wells and in the Edwards Aquifer is protected by the Safe Drinking Water Act of 1974 and the 1996 Amendments to the Act (Public Law 104-182), laws that protect drinking water and provide source water protection. The 1996 Amendments provided new and

stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection. These rules required states to delineate source water areas of public water systems and assess the susceptibility of such source waters to contamination. The source water assessment results would then be used to implement source water protection programs. TCEQ's Source Water Protection Program (SWPP) was created by the 1996 Amendments to the Safe Drinking Water Act and sets into motion a voluntary process by which local governments and suppliers of drinking water are encouraged to take proactive steps to protect local drinking water supplies before costly treatment enhancements are required. These supplies are defined primarily as water systems serving at least 15 connections or at least 25 persons at least 60 days per year.

The BSEACD, a groundwater conservation district with authority in the RSA, regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2010). The drought management program allows the BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevation at an observation well.

The COA has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. The Save Our Springs Ordinance, which was adopted in 1992, requires non-degradation and includes impervious cover limits of 15 percent for all development in the Recharge Zone, 20 percent for development in the Barton Creek portion of the Contributing Zone, and 25 percent for development in the remaining portions of the Contributing Zone in Williamson, Slaughter, Bear, Little Bear, and Onion Creeks (COA, 2013a). The most recent COA ordinance was passed on October 17, 2013; this ordinance aimed to improve creek and floodplain protection, prevent unsustainable public expense on drainage systems, simplify development regulations where possible, and minimize the ordinance's impact on the ability to develop land (COA, 2013c). Another water quality protection mechanism regulated by the COA is the city's WQPL program; this program currently manages 26,527 acres within the Contributing and Recharge Zones of the Barton Springs segment of the Edwards Aquifer (COA 2013b). The preservation of these sensitive tracts of land will not only help preserve the quality and quantity of water entering the aquifer, it will preserve wildlife habitat and native vegetation.

The Balcones Canyonlands Conservation Plan (BCCP), a regional Habitat Conservation Plan administered by the City of Austin and Travis County, protects over 28,000 acres in Travis County as the Balcones Canyonlands Preserve. The BCCP includes requirements to protect caves and other karst features where endangered species or species of concern have been found (COA-Travis County 1996).

Additional protections to karst features may occur as a result of groundwater protection or measures to protect habitat for karst or aquifer-dwelling species.

With regard to potential direct effects from the proposed project, specific efforts were made to avoid impacts to karst features and drainage areas. More than 220 individual landscape features in the state-owned ROW were investigated as potential recharge features. The seventeen sensitive features identified include five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge. The proposed alignment has been adjusted to avoid the openings or surface expressions of these sensitive features. The proposed project would impact the surface drainage basins of two sensitive features in the state-owned ROW and Flint Ridge Cave; the project would include measures to divert flow from compensating drainage areas adjacent to the natural drainage areas. In addition, a bottomless culvert is planned to span feature F-55 to allow upgradient water to infiltrate as it is conveyed beneath the roadway and provide recharge to the feature. These efforts to minimize impacts through redesign are important aspects of the minimization and mitigation requirements in Indirect and Cumulative impacts guidance literature.

8.3 Surface Water

Numerous regulations are in place to avoid or minimize impacts to water quality. The EPA's National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Clean Water Act (CWA), controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered by the TCEQ, as part of the Texas Pollutant Discharge Elimination System (TPDES). A NPDES permit may be required if wastewater is discharged into the stormwater system. The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. The Municipal Separate Storm Sewer (MS4) program applies to cities and counties and is overseen by TCEQ. As an MS4, Travis County implements a Stormwater Management Plan (SWMP), a comprehensive long-range plan to prevent and reduce stormwater pollution in the county (Travis County, 2014b).

Section 404 of the Clean Water Act gives the USACE authority to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Impacts to waters of the U.S. could require USACE authorization. Executive Order 11990 Protection of Wetlands (issued in 1977) requires federal agencies to minimize the destruction or modification of wetlands. Any future development project in the AOI would be required to comply with USACE regulations.

The TCEQ's Total Maximum Daily Load (TMDL) Program works to improve water quality in impaired or threatened water bodies in Texas. A TMDL defines an environmental target by determining the extent to which a certain pollutant must be reduced. TMDLs are developed for surface waters that are quality-limited due to a pollutant or adverse condition. Based on the environmental target in the TMDL, the State develops an implementation plan to mitigate sources of pollution within the watershed and restore impaired uses. The Texas Water Quality Inventory and 303(d) List is an overview of the status of surface waters of the State, including concerns for public health, fitness for aquatic species and other wildlife, and specific pollutants

and their possible sources. The 303(d) List, a subset of the Inventory, identifies waters that do not attain one or more standards for their use.

Floodplains are lowland areas adjacent to water bodies, which are inundated during flood events. Construction within a floodplain reduces its capacity for floodwater storage and infiltration, as well as its value as habitat. Under Executive Order 11988 Floodplain Management, the FEMA requires municipalities that participate in the National Flood Insurance Program to adopt floodplain ordinances that prohibit development in existing 100-year floodplain. Coordination with the local floodplain administrator would be required for developments affecting floodplains.

The COA Watershed Protection Ordinance specifies that an environmental resource inventory would be required for development projects located in a WQTZ or CWQZ, floodplain, karst region/aquifer, or on a track with a gradient of 15 percent or more. The inventory must identify critical environmental features (bluffs, canyon rimrocks, caves, faults and fractures, sinkholes, springs, and wetlands, as defined in the ordinance), provide justification for proposed spoil disposal locations or roadway alignments, propose methods to achieve overland flow, and describe proposed industrial uses and the pollution abatement program. It also states additional erosion and sedimentation control requirements in the Barton Springs Zone, as well as water quality control standards. Within these areas, the COA requires preparation of an Environmental Assessment if project impacts would occur within these buffer zones. If work is proposed in a buffer zone around a Critical Environmental Features (as defined by the City of Austin), a variance process would have to be followed to allow construction within that area.

A variety of regulations are in place to protect the quality of groundwater in the Barton Springs segment of the Edwards Aquifer, as discussed in previous sections.

The COA also has regulation in place for voids and water flow features discovered during construction. According to §1.12.1 of the Environmental Criteria Manual, "all work must stop if a void in the rock substrate is discovered which is one square foot in total area, blows air from within the substrate, and/or consistently receives water during any rain event. At this time it is the responsibility of the Project Manager to immediately contact a COA Environmental Inspector for further investigation." Development in the city of Austin would be required to comply with these standards.

TCEQ lists additional BMPs for construction and post-construction phases that future development projects would be required to consider, as discussed in the ***Water Quality and Aquatic Resource Protection Technical Report***. The section also discusses other non-traditional types of BMPs that could be used to reduce runoff and potential pollutants.

8.4 Various Municipal Codes including Land Development Regulations

8.4.1 City of Austin

The COA has environmental protection considerations in the Land Development Portion of the Austin City Code for subdivision development (Title 25-8) including considerations of water quality, erosion, impervious cover, and handling of wastewater. https://www.municode.com/library/tx/austin.

8.4.2 City of Buda

The City of Buda has environmental protection considerations in the City of Buda Unified Development Code; Chapter 5 has standards for impervious cover and Chapter 8 has details related to broader protection policies of environmental resources within the City of Buda; this includes water quality. http://tx-buda.civicplus.com/DocumentCenter/View/96

8.4.3 San Leanna

Within its comprehensive plan, the Village of San Leanna explicitly expressed “desire to conserve precious water resources”. The comprehensive plan can be downloaded here http://www.sanleannatx.com/Ordinances.php.

8.4.4 Travis County

The Travis County Code includes policies and procedures relating to construction standards in Chapter 80, which would make them subject to County Development Regulations. The County Development Regulations (Chapter 82) include provisions relating to the use and preservation of water resources as well as the amount of impervious cover allowable for projects within the County. http://www.co.travis.tx.us/tnr/links.asp.

8.4.5 Hays County

The Hays County Subdivision and Development Regulations document contains environmental protection considerations; available here: http://www.co.hays.tx.us/development-regulation.aspx. The Hays County Subdivision and Development Regulations (Article 1) also defers to the State of Texas Health and Safety Code, the Texas Water Code, and TCEQ to provide further guidance on environmental issues that may occur in Hays County. Further, Hays County is voluntarily a member of the Hill Country Alliance, whose mission statement is “…to bring together an ever-expanding alliance of groups throughout a multi-county region…with the long-term objective of preserving open spaces, water supply, water quality, and the unique character of the Texas Hill Country”. http://hillcountryalliance.org/HCA/HCAMissionStatement. The Hill Country Alliance website gives further details on the guidelines and programs to which the members are subject and/or in which they participate.

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9.0 CONCLUSIONS

This analysis consisted of a discussion of regulations and guidance, description of the scoping process and definition of the area of influence, summary of direct impacts and encroachment impacts, identification of resources that are at risk, and detailed analysis of those resources that are at risk. The goals of the various communities in the AOI were discussed and trend data for population and housing development were provided. Impact-causing activities were identified. The detailed technical analysis of access alteration effects and effects resulting from induced growth were presented, based on cartographic analysis, technical analysis, and the results of an extensive planner questionnaire. Minimization and mitigation measures were discussed as they pertain to the resources at risk in the AOI, including environmental regulations and land use development regulations in place throughout the AOI.

Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis counties, and the responses of local planning experts, the proposed project is not anticipated to generate significant induced development. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would constrain the amount of induced growth possible in the AOI. Several local planning experts maintain that much of the planned development in the area will occur regardless of the fate of the proposed project. Further, the Build Alternative is proposed as a limited access roadway with only three points of access. No frontage roads would be constructed along the route, which is bordered for most of its length by WQPLs prohibited from being developed. In addition, other roadways at the boundaries of the AOI such as RM 1826, RM 967, and FM 1626 are more likely to influence development near those roadways as opposed to SH 45SW. For these reasons, the proposed project's effects on induced growth would be expected to be minimal.

Induced growth could have some effect on water resources because induced development would result in increased impervious cover, which could in turn have an effect on water quality. However, surface water and groundwater in the AOI would not be adversely affected in a substantial way from the proposed project because of the high percentage of managed areas and the implementation of regulations and BMPs. The *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties* (TxDOT, SWCA, and Cambrian, 2014) describes the reasons that indirect effects are not anticipated to occur to sensitive species as a result of this project.

Approximately 9,387.3 acres of undeveloped land uses within the AOI could be subject to development in the foreseeable future. There are three access points where development could continue even without the proposed improvements. Development would potentially increase in those locations with the proposed improvements, but associated development potential nearby is low given that much of the adjacent land is not available for development

(including WQPLs). Development projects that do occur within the planning horizons of the municipalities contacted (through 2035) would have to comply with that city's land development code within the city limits and ETJ where applicable. Areas outside municipal limits would be subject to state and federal laws.

Existing regulatory processes would provide controls to avoid potential adverse water quality related impacts to threatened or endangered species. Impacts to individuals or habitat of federally-listed species are subject to federal regulations under the ESA of 1973. The COA and Travis County's BCCP, in addition to the Hays County RHCP, are available to developers to facilitate compliance with the ESA in the AOI. In addition, the Save Our Springs ordinance limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites in the Barton Springs Zone.

With regard to potential indirect effects on water quality resulting from potential development by others in the AOI, regulations are in place and applicable to proposed developments to minimize impacts to the resource. These include TCEQ regulations requiring preparation of SW3Ps and WPAPs, including use of BMPs in addition to the COA drainage/water quality requirements. USACE Section 404 provisions of the Clean Water Act govern activities that would affect waters of the U.S. and wetlands, regardless of who proposes the development activity. Individual developers would be responsible for complying with these regulations.

The indirect effects that have been described in this section do not conflict with the various goals of planning and conservation entities in the AOI; are not expected to substantially worsen the condition of a sensitive resource; would not delay or interfere with habitat conservation planning efforts or species recovery efforts for sensitive species; would not eliminate a valued, unique, or vulnerable feature; and are not inconsistent with applicable laws. Therefore, additional mitigation is not proposed for the anticipated indirect effects potentially caused by construction of SH 45SW.

Nonetheless, due to the sensitive nature of a few key resources, and the fact that the proposed project could contribute to some induced development within the AOI over the planning horizon, along with other development projects, the following resources will be further studied in the ***Cumulative Effects Technical Report***: Golden-cheeked Warbler, Barton Springs and Austin blind salamanders, Edwards Aquifer – Groundwater Resources, and Surface Water Resources.

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ATTACHMENT 1
INTERVIEW QUESTIONNAIRE AND MAP

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SH 45SW Environmental Impact Study Questionnaire

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (CTRMA) are conducting an Environmental Impact Study (SEIS) for the proposed construction of SH 45SW between MoPac and FM 1626.

To address increasing congestion on area roadways, the purpose of the proposed project is to improve system connectivity, local mobility, travel times, and provide an efficient alternative route to congested local roadways in northern Hays and southern Travis Counties. CP&Y, in conjunction with Blanton and Associates, Inc. (BAI), Cox|McLain Environmental Consulting, Inc. (CMEC), and Rodriguez Transportation Group (RTG), is preparing the SEIS for the proposed project. Under TxDOT guidance, the potential "indirect and cumulative" effects of the project must be addressed. To aid in assessing the potential direct, indirect, and cumulative impacts of the project we are contacting your agency/organization to obtain your insight on how the project may affect your community or the region.

We have attached a map of the project area with the proposed roadway shown along with our proposed Area of Influence for indirect effects analysis. Guidance from TxDOT requires that we assess potential indirect and cumulative effects out to the planning horizon, which has been established as 2035 in conjunction with the Capital Area Metropolitan Planning Organization's Regional Transportation Plan. A key component of this requirement is determining whether or not a project will have indirect effects such as induced growth and land use development. We are seeking to identify any areas where potential development could occur (whether or not it is currently planned) within the planning horizon that could be attributed at least in part to the roadway extension.

Please complete the following questionnaire to the best of your knowledge; if you are not the best person to answer the questions, please forward this to the appropriate person or persons within your organization. Please return your answers to the following address (electronic responses are welcomed with legible marked up maps) by **x date**:

POC
Company
Street
Austin, TX
Phone
Email

We recognize that the people who are most knowledgeable about how projects might affect a community are the local experts. We appreciate your time and input in this process.

Questionnaire

1. Are you aware of any substantial proposed land developments within your jurisdiction or area? If so, please mark the areas on the attached map and provide the location, type, and size (e.g. acres, density, number of units) of any planned developments.

2. On the attached map, please identify parcels (if any) that you think would likely be developed as a result of the proposed construction of SH 45SW that would not otherwise be developed. *(Please distinguish from developments identified in question 1)*.

3. Would the proposed project affect the rate of land development in your jurisdiction?

4. Is the proposed project consistent with local planning efforts (i.e. master or comprehensive plans, growth management plans, zoning or land use policies, etc)?

5. Are there other capital improvement projects – such as water or sewer infrastructure, school or hospital construction – that are planned for the area which might affect development in the project vicinity?

6. Are there any factors that could limit growth in the area, such as floodplains, current development, conservation easements, protected lands, etc?

7. How would the proposed project be expected to impact travel patterns in the area? Which roadways would benefit from the proposed project? How do people in the project area get to Austin now?

8. What type of traffic would you anticipate to use this facility (i.e. local traffic, regional commuters, through traffic)?

Travis
Hays
AUSTIN
SH 45
LOOP 1 (MoPac)
SLAUGHTER LN
BRODIE LN
MANCHACA RD
RM 1826
FM 1626
HAYS
I-35
FM 1626
RM 150
RM 967
MAIN ST
BUDA
TRAVIS CO
HAYS CO
Major Roads
Local Roads
Project Study Area
Area of Influence (AOI)
County Boundary
N
0
1
2
Miles
Date: 11/22/2013
Projection: NAD 83 Texas Central State Plane (ft)
Data Sources: CoA, FEMA, CAPCOG
Aerial: TNRIS, 2012
SH 45 SW
ENVIRONMENTAL STUDY
Area of Influence for Indirect Effects

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ATTACHMENT 2
TABLE OF DEVELOPMENTS IN THE AOI

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Table A.2-1: Developments in the AOI

Development Name	Location	Size	Type	# Homes	Dedi-cated Open Space	Source
Archellata Plat	MoPac & SH 45 in COA		residential	325 single family		TNR
Estancia	Old San Antonio Rd	600 ac	mixed use	29 lots		TNR
Boone-Heep	IH 35 & Old San Antonio Rd in Travis Co	344 ac	mixed use	10 lots		TNR
""	IH 35 & Old San Antonio Rd in Hays Co	63 ac	residential - multifamily			Hays Co
O Bar Ranch	RM 967 in Hays Co	1500 ac	residential/conservation	15 single family		Hays Co, BSEACD
Hays CISD High School	RM 967 west of FM 1626 in Hays Co	100 ac	school	N/A		Hays CISD, Buda
AISD High School	TBD	50-100 ac	school	N/A		AISD
Giberson	RM 967 & FM 1626 in Hays Co	81 ac	mixed use (C, MF)			Buda
Arveda	RM 967 just north of 147 in Buda	10 ac	residential	48 Single family (0% built)		Buda
Garlic Creek/Whispering Hollow/Elm Grove	RM 967 & FM 1626 in Buda		residential	1951 single family (80% built)		Buda
Aria Memory Care	Slaughter Ln near RM 1826 in COA	5.8 ac	group home			COA
Avana Phase 2	county line east of RM1826 in COA	149.12 ac	residential	229 single family		COA
Circle C Child Development Center	La Crosse & Escarpment in COA	6 ac	day care	N/A		COA
Lynnbrook Condos	Lynnbrook in COA ETJ	3.87 ac	residential - townhomes			COA
Veritas Academy	within Avana development; south of county line at Escarpment Blvd in COA ETJ	91 ac	school			COA
Sweetwater Glen	between S 1st and IH 35 in COA	53 ac	residential	253 condos		COA
Circle C Ranch Tract 8A	Escarpment Blvd & SH 45 in COA	18 ac	residential	36 single family		COA

Table A.2-1: Developments in the AOI cont'd

Development Name	Location	Size	Type	# Homes	Dedi-cated Open Space	Source
Avana	south of county line between RM 1826 & Violet Crown Trail	1020 ac	residential - with hotel, villas, condos, golf course	~800 Single family; 24 villas, 140 condos		COA, TNR, Hays Co
Hills of Shady Hollow/Bear Creek	FM 1626 south of Brodie in COA ETJ	77 ac	mixed use - 5 ac retail	208 single family	35 ac	COA
""	FM 1626 south of Brodie in COA ETJ		residential	83 single family		TNR
Manchaca Rd Business Park Phase B	Manchaca Rd south of Slaughter Ln in COA ETJ	3.96 ac	warehouse & office			COA
Ravenscroft Commercial	Manchaca Rd and Ravenscroft Dr in COA ETJ	4 ac	office, retail			COA
Slaughter 100 Tract 14A	MoPac & SH 45 in COA	36 ac	office			COA
Brodie Springs II Phase 2	Brodie Ln near Slaughter Ln in COA	5.13 ac	residential	12 single family		COA
Circle C Golf Estates Phase II	La Crosse near RM 1826 in COA	44.7 ac	residential	79 single family		COA
Esquel Phase 1 Section 4	SH 45 & Escarpment Blvd in COA	45 ac	residential	78 single family		COA
Dakota Springs/Marbridge Estates	Brodie Ln & FM 1626 in COA ETJ	112.5 ac	residential	301 single family	33.5 ac	COA
Greyrock Ridge	MoPac & SH 45 in COA	177 ac	residential	387 single family on 103 ac	55 ac	COA, TNR
Overlook Estates	MoPac & Slaughter Ln in COA	41 ac	residential	39 single family	6 ac	COA
Ranch House Apts	Slaughter Ln & Brodie Ln in COA	15.23 ac	residential - multifamily	272 Multifamily		COA
Reserve at Lynnbrook	Lynnbrook in COA ETJ	11.5 ac	residential	34 single family		COA
Shady Hollow Gardens	Frate Barker in COA ETJ	35.5 ac	residential	144 townhomes		COA
Parmer Village Townhomes	Slaughter Ln & West Gate Blvd in COA	16.27 ac	residential	115 townhomes		COA

Source: Interviews with Planning Experts, 2013 - 2014.

APPENDIX E
CENSUS DATA

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Appendix E: Census Data

Table E-1: Race by Block within Study Area

Geography	Total Population	Not Hispanic or Latino		White		Black		Native American or Alaskan Native		Asian		Hawaiian or Pacific Islander		Other Race		Two or More Races	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Block 1001, Block Group 1, Census Tract 109.01, Hays Coun	13	12	92.3	13	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1002, Block Group 1, Census Tract 109.01, Hays Coun	27	25	92.6	20	74.1	3	11.1	0	0	0	0	0	0	0	0	4	14.8
Block 1003, Block Group 1, Census Tract 109.01, Hays Coun	22	22	100.0	22	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1008, Block Group 1, Census Tract 109.01, Hays Coun	2	2	100.0	2	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1012, Block Group 1, Census Tract 109.01, Hays Coun	319	298	93.4	305	95.6	3	0.9	0	0	3	0.9	0	0	5	1.6	3	0.9
Block 1013, Block Group 1, Census Tract 109.01, Hays Coun	11	11	100.0	11	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1014, Block Group 1, Census Tract 109.01, Hays Coun	28	23	82.1	26	92.9	0	0	0	0	0	0	0	0	0	0	2	7.1
Block 1015, Block Group 1, Census Tract 109.01, Hays Coun	21	21	100.0	21	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1016, Block Group 1, Census Tract 109.01, Hays Coun	200	186	93.0	184	92	1	0.5	1	0.5	5	2.5	0	0	0	0	9	4.5
Block 1017, Block Group 1, Census Tract 109.01, Hays Coun	32	31	96.9	29	90.6	0	0	0	0	3	9.4	0	0	0	0	0	0
Block 1018, Block Group 1, Census Tract 109.01, Hays Coun	15	15	100.0	11	73.3	0	0	0	0	4	26.7	0	0	0	0	0	0
Block 1019, Block Group 1, Census Tract 109.01, Hays Coun	5	5	100.0	4	80	0	0	0	0	1	20	0	0	0	0	0	0
Block 1020, Block Group 1, Census Tract 109.01, Hays Coun	23	23	100.0	23	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1021, Block Group 1, Census Tract 109.01, Hays Coun	17	14	82.4	17	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1022, Block Group 1, Census Tract 109.01, Hays Coun	17	9	52.9	17	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1023, Block Group 1, Census Tract 109.01, Hays Coun	41	28	68.3	40	97.6	0	0	0	0	0	0	0	0	0	0	1	2.4
Block 1024, Block Group 1, Census Tract 109.01, Hays Coun	107	100	93.5	99	92.5	4	3.7	0	0	0	0	0	0	4	3.7	0	0
Block 1025, Block Group 1, Census Tract 109.01, Hays Coun	285	240	84.2	262	91.9	5	1.8	1	0.4	4	1.4	1	0.4	8	2.8	4	1.4
Block 1026, Block Group 1, Census Tract 109.01, Hays Coun	2	2	100.0	2	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1027, Block Group 1, Census Tract 109.01, Hays Coun	32	24	75.0	29	90.6	0	0	0	0	0	0	0	0	0	0	3	9.4
Block 1030, Block Group 1, Census Tract 109.01, Hays Coun	20	16	80.0	20	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1031, Block Group 1, Census Tract 109.01, Hays Coun	23	11	47.8	21	91.3	0	0	0	0	0	0	1	4.3	1	4.3	0	0
Block 1032, Block Group 1, Census Tract 109.01, Hays Coun	98	84	85.7	94	95.9	0	0	0	0	0	0	0	0	1	1	3	3.1
Block 1033, Block Group 1, Census Tract 109.01, Hays Coun	185	158	85.4	172	93	7	3.8	2	1.1	2	1.1	0	0	1	0.5	1	0.5
Block 1034, Block Group 1, Census Tract 109.01, Hays Coun	13	12	92.3	12	92.3	0	0	0	0	1	7.7	0	0	0	0	0	0
Block 1035, Block Group 1, Census Tract 109.01, Hays Coun	18	17	94.4	16	88.9	0	0	0	0	0	0	0	0	1	5.6	1	5.6
Block 1036, Block Group 1, Census Tract 109.01, Hays Coun	12	8	66.7	10	83.3	2	16.7	0	0	0	0	0	0	0	0	0	0
Block 1038, Block Group 1, Census Tract 109.01, Hays Coun	1	1	100.0	1	100	0	0	0	0	0	0	0	0	0	0	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area

Block 2000, Block Group 2, Census Tract 109.01, Hays Coun	173	142	82.1	160	92.5	0	0	1	0.6	0	0	0	0	7	4	5	2.9
Block 2002, Block Group 2, Census Tract 109.01, Hays Coun	51	44	86.3	49	96.1	0	0	0	0	1	2	0	0	0	0	1	2
Block 2003, Block Group 2, Census Tract 109.01, Hays Coun	52	45	86.5	48	92.3	0	0	1	1.9	0	0	0	0	1	1.9	2	3.8
Block 2004, Block Group 2, Census Tract 109.01, Hays Coun	27	26	96.3	24	88.9	2	7.4	0	0	0	0	0	0	0	0	1	3.7
Block 2005, Block Group 2, Census Tract 109.01, Hays Coun	105	88	83.8	103	98.1	0	0	1	1	0	0	0	0	1	1	0	0
Block 2006, Block Group 2, Census Tract 109.01, Hays Coun	2	2	100.0	2	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2008, Block Group 2, Census Tract 109.01, Hays Coun	25	21	84.0	23	92	0	0	0	0	1	4	0	0	0	0	1	4
Block 2009, Block Group 2, Census Tract 109.01, Hays Coun	27	24	88.9	26	96.3	0	0	0	0	0	0	0	0	1	3.7	0	0
Block 2011, Block Group 2, Census Tract 109.01, Hays Coun	12	8	66.7	12	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2012, Block Group 2, Census Tract 109.01, Hays Coun	134	99	73.9	122	91	2	1.5	2	1.5	0	0	0	0	8	6	0	0
Block 2013, Block Group 2, Census Tract 109.01, Hays Coun	40	27	67.5	29	72.5	1	2.5	0	0	0	0	0	0	8	20	2	5
Block 2014, Block Group 2, Census Tract 109.01, Hays Coun	92	70	76.1	77	83.7	1	1.1	0	0	1	1.1	0	0	11	12	2	2.2
Block 2015, Block Group 2, Census Tract 109.01, Hays Coun	72	66	91.7	62	86.1	4	5.6	0	0	2	2.8	0	0	1	1.4	3	4.2
Block 2016, Block Group 2, Census Tract 109.01, Hays Coun	22	21	95.5	22	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2017, Block Group 2, Census Tract 109.01, Hays Coun	25	18	72.0	24	96	0	0	0	0	1	4	0	0	0	0	0	0
Block 2018, Block Group 2, Census Tract 109.01, Hays Coun	653	539	82.5	613	93.9	13	2	1	0.2	5	0.8	0	0	12	1.8	9	1.4
Block 2019, Block Group 2, Census Tract 109.01, Hays Coun	124	109	87.9	120	96.8	3	2.4	1	0.8	0	0	0	0	0	0	0	0
Block 2020, Block Group 2, Census Tract 109.01, Hays Coun	40	34	85.0	38	95	1	2.5	0	0	0	0	0	0	0	0	1	2.5
Block 2021, Block Group 2, Census Tract 109.01, Hays Coun	50	25	50.0	50	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2022, Block Group 2, Census Tract 109.01, Hays Coun	48	34	70.8	40	83.3	3	6.3	0	0	2	4.2	0	0	0	0	3	6.3
Block 2023, Block Group 2, Census Tract 109.01, Hays Coun	97	76	78.4	88	90.7	4	4.1	0	0	0	0	0	0	4	4.1	1	1
Block 2024, Block Group 2, Census Tract 109.01, Hays Coun	25	23	92.0	25	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2025, Block Group 2, Census Tract 109.01, Hays Coun	43	35	81.4	40	93	0	0	0	0	0	0	0	0	3	7	0	0
Block 2026, Block Group 2, Census Tract 109.01, Hays Coun	23	19	82.6	20	87	0	0	0	0	0	0	0	0	2	8.7	1	4.3
Block 2027, Block Group 2, Census Tract 109.01, Hays Coun	21	14	66.7	18	85.7	1	4.8	0	0	0	0	0	0	0	0	2	9.5
Block 2028, Block Group 2, Census Tract 109.01, Hays Coun	25	25	100.0	18	72	0	0	0	0	1	4	0	0	0	0	6	24
Block 2029, Block Group 2, Census Tract 109.01, Hays Coun	88	84	95.5	84	95.5	0	0	0	0	3	3.4	0	0	0	0	1	1.1
Block 2030, Block Group 2, Census Tract 109.01, Hays Coun	35	32	91.4	34	97.1	1	2.9	0	0	0	0	0	0	0	0	0	0
Block 2031, Block Group 2, Census Tract 109.01, Hays Coun	3	3	100.0	3	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2032, Block Group 2, Census Tract 109.01, Hays Coun	32	23	71.9	30	93.8	1	3.1	0	0	0	0	0	0	0	0	1	3.1
Block 2033, Block Group 2, Census Tract 109.01, Hays Coun	22	20	90.9	19	86.4	1	4.5	0	0	0	0	0	0	2	9.1	0	0
Block 2034, Block Group 2, Census Tract 109.01, Hays Coun	82	72	87.8	78	95.1	0	0	0	0	0	0	0	0	0	0	4	4.9
Block 3000, Block Group 3, Census Tract 109.01, Hays Coun	2	2	100.0	2	100	0	0	0	0	0	0	0	0	0	0	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area

Block 3002, Block Group 3, Census Tract 109.01, Hays Coun	40	20	50.0	24	60	0	0	0	0	0	0	0	0	16	40	0	0
Block 3003, Block Group 3, Census Tract 109.01, Hays Coun	5	5	100.0	5	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3004, Block Group 3, Census Tract 109.01, Hays Coun	185	173	93.5	182	98.4	1	0.5	0	0	0	0	0	0	2	1.1	0	0
Block 3005, Block Group 3, Census Tract 109.01, Hays Coun	32	25	78.1	29	90.6	0	0	2	6.3	1	3.1	0	0	0	0	0	0
Block 3006, Block Group 3, Census Tract 109.01, Hays Coun	31	29	93.5	31	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3007, Block Group 3, Census Tract 109.01, Hays Coun	40	26	65.0	40	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3008, Block Group 3, Census Tract 109.01, Hays Coun	2	1	50.0	0	0	0	0	0	0	0	0	0	0	1	50	1	50
Block 3009, Block Group 3, Census Tract 109.01, Hays Coun	185	162	87.6	178	96.2	4	2.2	0	0	1	0.5	1	0.5	1	0.5	0	0
Block 3010, Block Group 3, Census Tract 109.01, Hays Coun	35	31	88.6	32	91.4	0	0	0	0	2	5.7	0	0	0	0	1	2.9
Block 3011, Block Group 3, Census Tract 109.01, Hays Coun	44	42	95.5	44	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3012, Block Group 3, Census Tract 109.01, Hays Coun	30	22	73.3	27	90	0	0	0	0	0	0	0	0	3	10	0	0
Block 3013, Block Group 3, Census Tract 109.01, Hays Coun	47	45	95.7	46	97.9	0	0	0	0	0	0	0	0	1	2.1	0	0
Block 3014, Block Group 3, Census Tract 109.01, Hays Coun	19	19	100.0	19	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3015, Block Group 3, Census Tract 109.01, Hays Coun	64	59	92.2	62	96.9	2	3.1	0	0	0	0	0	0	0	0	0	0
Block 3016, Block Group 3, Census Tract 109.01, Hays Coun	63	55	87.3	63	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3017, Block Group 3, Census Tract 109.01, Hays Coun	25	21	84.0	23	92	0	0	0	0	0	0	0	0	0	0	2	8
Block 3018, Block Group 3, Census Tract 109.01, Hays Coun	75	59	78.7	71	94.7	0	0	0	0	1	1.3	0	0	2	2.7	1	1.3
Block 3019, Block Group 3, Census Tract 109.01, Hays Coun	485	407	83.9	440	90.7	16	3.3	0	0	3	0.6	0	0	17	3.5	9	1.9
Block 3020, Block Group 3, Census Tract 109.01, Hays Coun	75	58	77.3	65	86.7	0	0	0	0	2	2.7	0	0	5	6.7	3	4
Block 3021, Block Group 3, Census Tract 109.01, Hays Coun	57	42	73.7	55	96.5	0	0	0	0	0	0	0	0	2	3.5	0	0
Block 3022, Block Group 3, Census Tract 109.01, Hays Coun	15	15	100.0	13	86.7	0	0	0	0	2	13.3	0	0	0	0	0	0
Block 3023, Block Group 3, Census Tract 109.01, Hays Coun	64	56	87.5	56	87.5	1	1.6	0	0	4	6.3	0	0	1	1.6	2	3.1
Block 3025, Block Group 3, Census Tract 109.01, Hays Coun	49	43	87.8	41	83.7	4	8.2	0	0	0	0	0	0	4	8.2	0	0
Block 3026, Block Group 3, Census Tract 109.01, Hays Coun	108	78	72.2	82	75.9	1	0.9	0	0	0	0	0	0	19	17.6	6	5.6
Block 3027, Block Group 3, Census Tract 109.01, Hays Coun	78	72	92.3	69	88.5	7	9	0	0	0	0	0	0	1	1.3	1	1.3
Block 3028, Block Group 3, Census Tract 109.01, Hays Coun	37	33	89.2	37	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3029, Block Group 3, Census Tract 109.01, Hays Coun	163	130	79.8	146	89.6	0	0	0	0	1	0.6	0	0	14	8.6	2	1.2
Block 3030, Block Group 3, Census Tract 109.01, Hays Coun	33	28	84.8	30	90.9	3	9.1	0	0	0	0	0	0	0	0	0	0
Block 3031, Block Group 3, Census Tract 109.01, Hays Coun	393	300	76.3	351	89.3	10	2.5	2	0.5	3	0.8	0	0	14	3.6	13	3.3
Block 3032, Block Group 3, Census Tract 109.01, Hays Coun	70	54	77.1	55	78.6	2	2.9	0	0	0	0	0	0	5	7.1	8	11.4
Block 3033, Block Group 3, Census Tract 109.01, Hays Coun	65	54	83.1	65	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3034, Block Group 3, Census Tract 109.01, Hays Coun	8	7	87.5	7	87.5	0	0	0	0	0	0	0	0	1	12.5	0	0
Block 3038, Block Group 3, Census Tract 109.01, Hays Coun	42	39	92.9	38	90.5	2	4.8	1	2.4	0	0	0	0	1	2.4	0	0

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Table E-1: Race by Block within Study Area

Block 3039, Block Group 3, Census Tract 109.01, Hays Coun	4	4	100.0	3	75	1	25	0	0	0	0	0	0	0	0	0	0
Block 3043, Block Group 3, Census Tract 109.01, Hays Coun	29	14	48.3	26	89.7	0	0	0	0	0	0	0	0	1	3.4	2	6.9
Block 3044, Block Group 3, Census Tract 109.01, Hays Coun	103	76	73.8	98	95.1	0	0	0	0	0	0	0	0	0	0	5	4.9
Block 3045, Block Group 3, Census Tract 109.01, Hays Coun	4	3	75.0	1	25	0	0	0	0	0	0	0	0	1	25	2	50
Block 3047, Block Group 3, Census Tract 109.01, Hays Coun	57	50	87.7	50	87.7	4	7	0	0	0	0	0	0	3	5.3	0	0
Block 4001, Block Group 4, Census Tract 109.01, Hays Coun	70	58	82.9	63	90	2	2.9	0	0	0	0	0	0	2	2.9	3	4.3
Block 4002, Block Group 4, Census Tract 109.01, Hays Coun	23	16	69.6	23	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 4003, Block Group 4, Census Tract 109.01, Hays Coun	30	25	83.3	30	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 4004, Block Group 4, Census Tract 109.01, Hays Coun	37	31	83.8	32	86.5	0	0	0	0	0	0	0	0	0	0	5	13.5
Block 4005, Block Group 4, Census Tract 109.01, Hays Coun	46	42	91.3	46	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 4006, Block Group 4, Census Tract 109.01, Hays Coun	164	132	80.5	158	96.3	0	0	0	0	0	0	0	0	6	3.7	0	0
Block 4008, Block Group 4, Census Tract 109.01, Hays Coun	41	38	92.7	37	90.2	0	0	1	2.4	0	0	0	0	3	7.3	0	0
Block 4009, Block Group 4, Census Tract 109.01, Hays Coun	60	48	80.0	58	96.7	0	0	0	0	0	0	0	0	1	1.7	1	1.7
Block 4010, Block Group 4, Census Tract 109.01, Hays Coun	56	35	62.5	51	91.1	0	0	0	0	0	0	0	0	5	8.9	0	0
Block 4011, Block Group 4, Census Tract 109.01, Hays Coun	35	32	91.4	34	97.1	0	0	0	0	1	2.9	0	0	0	0	0	0
Block 4012, Block Group 4, Census Tract 109.01, Hays Coun	70	66	94.3	63	90	2	2.9	0	0	0	0	0	0	0	0	5	7.1
Block 4013, Block Group 4, Census Tract 109.01, Hays Coun	43	22	51.2	39	90.7	0	0	0	0	0	0	0	0	4	9.3	0	0
Block 4014, Block Group 4, Census Tract 109.01, Hays Coun	5	2	40.0	5	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 4015, Block Group 4, Census Tract 109.01, Hays Coun	40	37	92.5	38	95	2	5	0	0	0	0	0	0	0	0	0	0
Block 4016, Block Group 4, Census Tract 109.01, Hays Coun	34	29	85.3	31	91.2	1	2.9	0	0	0	0	0	0	0	0	2	5.9
Block 4017, Block Group 4, Census Tract 109.01, Hays Coun	45	37	82.2	39	86.7	0	0	0	0	0	0	0	0	6	13.3	0	0
Block 4018, Block Group 4, Census Tract 109.01, Hays Coun	48	42	87.5	48	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 4019, Block Group 4, Census Tract 109.01, Hays Coun	48	34	70.8	38	79.2	0	0	1	2.1	1	2.1	0	0	7	14.6	1	2.1
Block 4020, Block Group 4, Census Tract 109.01, Hays Coun	59	50	84.7	53	89.8	0	0	0	0	3	5.1	0	0	1	1.7	2	3.4
Block 4021, Block Group 4, Census Tract 109.01, Hays Coun	42	34	81.0	37	88.1	0	0	0	0	0	0	0	0	4	9.5	1	2.4
Block 4022, Block Group 4, Census Tract 109.01, Hays Coun	51	44	86.3	48	94.1	0	0	0	0	0	0	0	0	3	5.9	0	0
Block 1000, Block Group 1, Census Tract 17.70, Travis Coun	3	3	100.0	3	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1001, Block Group 1, Census Tract 17.70, Travis Coun	1645	1502	91.3	1338	81.3	33	2	3	0.2	217	13.2	0	0	24	1.5	30	1.8
Block 1002, Block Group 1, Census Tract 17.70, Travis Coun	37	29	78.4	34	91.9	2	5.4	0	0	1	2.7	0	0	0	0	0	0
Block 1003, Block Group 1, Census Tract 17.70, Travis Coun	115	101	87.8	99	86.1	0	0	0	0	9	7.8	0	0	0	0	7	6.1
Block 1004, Block Group 1, Census Tract 17.70, Travis Coun	45	41	91.1	31	68.9	0	0	0	0	11	24.4	0	0	0	0	3	6.7
Block 1005, Block Group 1, Census Tract 17.70, Travis Coun	92	85	92.4	68	73.9	0	0	1	1.1	14	15.2	0	0	1	1.1	8	8.7
Block 1006, Block Group 1, Census Tract 17.70, Travis Coun	57	52	91.2	40	70.2	6	10.5	0	0	8	14	0	0	0	0	3	5.3

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Table E-1: Race by Block within Study Area

Block 1007, Block Group 1, Census Tract 17.70, Travis Coun	60	60	100.0	52	86.7	4	6.7	0	0	4	6.7	0	0	0	0	0	0
Block 1008, Block Group 1, Census Tract 17.70, Travis Coun	104	97	93.3	84	80.8	4	3.8	0	0	15	14.4	0	0	0	0	1	1
Block 1009, Block Group 1, Census Tract 17.70, Travis Coun	60	53	88.3	57	95	1	1.7	1	1.7	1	1.7	0	0	0	0	0	0
Block 1010, Block Group 1, Census Tract 17.70, Travis Coun	70	51	72.9	53	75.7	0	0	0	0	17	24.3	0	0	0	0	0	0
Block 1011, Block Group 1, Census Tract 17.70, Travis Coun	175	154	88.0	154	88	8	4.6	0	0	10	5.7	0	0	0	0	3	1.7
Block 1012, Block Group 1, Census Tract 17.70, Travis Coun	54	54	100.0	44	81.5	4	7.4	0	0	6	11.1	0	0	0	0	0	0
Block 1013, Block Group 1, Census Tract 17.70, Travis Coun	51	39	76.5	42	82.4	0	0	1	2	2	3.9	0	0	6	11.8	0	0
Block 1014, Block Group 1, Census Tract 17.70, Travis Coun	1156	985	85.2	965	83.5	14	1.2	5	0.4	103	8.9	2	0.2	22	1.9	45	3.9
Block 1015, Block Group 1, Census Tract 17.70, Travis Coun	28	28	100.0	26	92.9	0	0	0	0	2	7.1	0	0	0	0	0	0
Block 1016, Block Group 1, Census Tract 17.70, Travis Coun	154	132	85.7	123	79.9	4	2.6	5	3.2	14	9.1	0	0	8	5.2	0	0
Block 1017, Block Group 1, Census Tract 17.70, Travis Coun	37	33	89.2	37	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1018, Block Group 1, Census Tract 17.70, Travis Coun	110	91	82.7	70	63.6	0	0	0	0	37	33.6	0	0	0	0	3	2.7
Block 1019, Block Group 1, Census Tract 17.70, Travis Coun	149	126	84.6	127	85.2	0	0	0	0	13	8.7	0	0	0	0	9	6
Block 1020, Block Group 1, Census Tract 17.70, Travis Coun	21	21	100.0	14	66.7	3	14.3	0	0	4	19	0	0	0	0	0	0
Block 1022, Block Group 1, Census Tract 17.70, Travis Coun	42	34	81.0	37	88.1	0	0	0	0	0	0	0	0	5	11.9	0	0
Block 1025, Block Group 1, Census Tract 17.70, Travis Coun	56	53	94.6	45	80.4	0	0	0	0	8	14.3	0	0	0	0	3	5.4
Block 1026, Block Group 1, Census Tract 17.70, Travis Coun	397	370	93.2	341	85.9	6	1.5	0	0	36	9.1	0	0	1	0.3	13	3.3
Block 1027, Block Group 1, Census Tract 17.70, Travis Coun	30	26	86.7	24	80	1	3.3	0	0	3	10	0	0	0	0	2	6.7
Block 1028, Block Group 1, Census Tract 17.70, Travis Coun	62	56	90.3	57	91.9	0	0	0	0	1	1.6	0	0	0	0	4	6.5
Block 1029, Block Group 1, Census Tract 17.70, Travis Coun	62	59	95.2	54	87.1	0	0	0	0	7	11.3	0	0	1	1.6	0	0
Block 1030, Block Group 1, Census Tract 17.70, Travis Coun	84	75	89.3	68	81	0	0	0	0	16	19	0	0	0	0	0	0
Block 1031, Block Group 1, Census Tract 17.70, Travis Coun	166	132	79.5	141	84.9	2	1.2	0	0	19	11.4	0	0	0	0	4	2.4
Block 1032, Block Group 1, Census Tract 17.70, Travis Coun	82	72	87.8	43	52.4	0	0	0	0	39	47.6	0	0	0	0	0	0
Block 1033, Block Group 1, Census Tract 17.70, Travis Coun	164	151	92.1	130	79.3	4	2.4	0	0	25	15.2	0	0	1	0.6	4	2.4
Block 1034, Block Group 1, Census Tract 17.70, Travis Coun	77	64	83.1	56	72.7	0	0	1	1.3	17	22.1	0	0	2	2.6	1	1.3
Block 1035, Block Group 1, Census Tract 17.70, Travis Coun	160	140	87.5	135	84.4	0	0	3	1.9	12	7.5	0	0	6	3.8	4	2.5
Block 1036, Block Group 1, Census Tract 17.70, Travis Coun	85	68	80.0	78	91.8	0	0	0	0	7	8.2	0	0	0	0	0	0
Block 1037, Block Group 1, Census Tract 17.70, Travis Coun	113	102	90.3	87	77	5	4.4	0	0	20	17.7	0	0	0	0	1	0.9
Block 1038, Block Group 1, Census Tract 17.70, Travis Coun	41	32	78.0	38	92.7	1	2.4	2	4.9	0	0	0	0	0	0	0	0
Block 1039, Block Group 1, Census Tract 17.70, Travis Coun	81	59	72.8	79	97.5	0	0	0	0	1	1.2	0	0	1	1.2	0	0
Block 1040, Block Group 1, Census Tract 17.70, Travis Coun	56	44	78.6	38	67.9	0	0	4	7.1	10	17.9	0	0	4	7.1	0	0
Block 1041, Block Group 1, Census Tract 17.70, Travis Coun	59	44	74.6	44	74.6	0	0	0	0	8	13.6	0	0	3	5.1	4	6.8
Block 1042, Block Group 1, Census Tract 17.70, Travis Coun	76	59	77.6	67	88.2	4	5.3	0	0	5	6.6	0	0	0	0	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area

Block 1043, Block Group 1, Census Tract 17.70, Travis Coun	188	165	87.8	169	89.9	0	0	0	0	9	4.8	0	0	3	1.6	7	3.7
Block 1044, Block Group 1, Census Tract 17.70, Travis Coun	63	48	76.2	39	61.9	0	0	0	0	13	20.6	0	0	11	17.5	0	0
Block 1045, Block Group 1, Census Tract 17.70, Travis Coun	86	74	86.0	81	94.2	0	0	1	1.2	0	0	0	0	4	4.7	0	0
Block 1046, Block Group 1, Census Tract 17.70, Travis Coun	68	66	97.1	62	91.2	0	0	0	0	3	4.4	0	0	0	0	3	4.4
Block 1047, Block Group 1, Census Tract 17.70, Travis Coun	133	109	82.0	109	82	2	1.5	0	0	13	9.8	0	0	5	3.8	4	3
Block 1050, Block Group 1, Census Tract 17.70, Travis Coun	79	54	68.4	63	79.7	0	0	0	0	5	6.3	0	0	7	8.9	4	5.1
Block 1051, Block Group 1, Census Tract 17.70, Travis Coun	47	43	91.5	47	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1054, Block Group 1, Census Tract 17.70, Travis Coun	50	47	94.0	40	80	6	12	0	0	4	8	0	0	0	0	0	0
Block 1055, Block Group 1, Census Tract 17.70, Travis Coun	103	96	93.2	81	78.6	0	0	0	0	13	12.6	0	0	0	0	9	8.7
Block 2000, Block Group 2, Census Tract 17.70, Travis Coun	395	352	89.1	326	82.5	13	3.3	0	0	41	10.4	0	0	6	1.5	9	2.3
Block 2001, Block Group 2, Census Tract 17.70, Travis Coun	82	69	84.1	61	74.4	0	0	0	0	14	17.1	0	0	5	6.1	2	2.4
Block 2002, Block Group 2, Census Tract 17.70, Travis Coun	61	53	86.9	39	63.9	0	0	0	0	18	29.5	0	0	2	3.3	2	3.3
Block 2003, Block Group 2, Census Tract 17.70, Travis Coun	20	19	95.0	20	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2005, Block Group 2, Census Tract 17.70, Travis Coun	28	24	85.7	21	75	0	0	0	0	0	0	0	0	4	14.3	3	10.7
Block 2007, Block Group 2, Census Tract 17.70, Travis Coun	86	76	88.4	58	67.4	5	5.8	0	0	15	17.4	0	0	6	7	2	2.3
Block 2008, Block Group 2, Census Tract 17.70, Travis Coun	98	83	84.7	73	74.5	2	2	0	0	19	19.4	0	0	0	0	4	4.1
Block 2010, Block Group 2, Census Tract 17.70, Travis Coun	91	81	89.0	71	78	8	8.8	0	0	12	13.2	0	0	0	0	0	0
Block 2011, Block Group 2, Census Tract 17.70, Travis Coun	6	4	66.7	6	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2016, Block Group 2, Census Tract 17.70, Travis Coun	190	177	93.2	163	85.8	4	2.1	0	0	16	8.4	0	0	2	1.1	5	2.6
Block 2017, Block Group 2, Census Tract 17.70, Travis Coun	240	215	89.6	219	91.3	1	0.4	0	0	12	5	0	0	4	1.7	4	1.7
Block 2019, Block Group 2, Census Tract 17.70, Travis Coun	352	326	92.6	309	87.8	9	2.6	0	0	23	6.5	0	0	5	1.4	6	1.7
Block 2021, Block Group 2, Census Tract 17.70, Travis Coun	347	327	94.2	317	91.4	11	3.2	0	0	12	3.5	0	0	1	0.3	6	1.7
Block 2022, Block Group 2, Census Tract 17.70, Travis Coun	62	61	98.4	58	93.5	0	0	1	1.6	1	1.6	0	0	0	0	2	3.2
Block 2025, Block Group 2, Census Tract 17.70, Travis Coun	97	81	83.5	89	91.8	4	4.1	1	1	1	1	0	0	1	1	1	1
Block 3001, Block Group 3, Census Tract 17.70, Travis Coun	639	580	90.8	546	85.4	8	1.3	2	0.3	57	8.9	0	0	2	0.3	24	3.8
Block 3002, Block Group 3, Census Tract 17.70, Travis Coun	87	80	92.0	66	75.9	0	0	0	0	21	24.1	0	0	0	0	0	0
Block 3003, Block Group 3, Census Tract 17.70, Travis Coun	137	110	80.3	115	83.9	0	0	0	0	17	12.4	0	0	1	0.7	4	2.9
Block 3004, Block Group 3, Census Tract 17.70, Travis Coun	119	106	89.1	94	79	1	0.8	0	0	10	8.4	0	0	8	6.7	6	5
Block 3005, Block Group 3, Census Tract 17.70, Travis Coun	96	93	96.9	61	63.5	0	0	0	0	28	29.2	0	0	0	0	7	7.3
Block 3006, Block Group 3, Census Tract 17.70, Travis Coun	117	93	79.5	92	78.6	0	0	6	5.1	13	11.1	0	0	4	3.4	2	1.7
Block 3007, Block Group 3, Census Tract 17.70, Travis Coun	160	144	90.0	120	75	8	5	2	1.3	20	12.5	0	0	9	5.6	1	0.6
Block 3008, Block Group 3, Census Tract 17.70, Travis Coun	141	125	88.7	121	85.8	0	0	4	2.8	10	7.1	0	0	5	3.5	1	0.7
Block 3009, Block Group 3, Census Tract 17.70, Travis Coun	70	70	100.0	55	78.6	0	0	0	0	15	21.4	0	0	0	0	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area

Block 3010, Block Group 3, Census Tract 17.70, Travis Coun	125	105	84.0	97	77.6	0	0	0	0	11	8.8	0	0	2	1.6	15	12
Block 3011, Block Group 3, Census Tract 17.70, Travis Coun	63	56	88.9	50	79.4	0	0	0	0	6	9.5	0	0	3	4.8	4	6.3
Block 3012, Block Group 3, Census Tract 17.70, Travis Coun	132	113	85.6	104	78.8	0	0	0	0	19	14.4	0	0	4	3	5	3.8
Block 3013, Block Group 3, Census Tract 17.70, Travis Coun	80	76	95.0	76	95	0	0	0	0	4	5	0	0	0	0	0	0
Block 3014, Block Group 3, Census Tract 17.70, Travis Coun	67	64	95.5	57	85.1	0	0	0	0	7	10.4	0	0	1	1.5	2	3
Block 3015, Block Group 3, Census Tract 17.70, Travis Coun	190	168	88.4	157	82.6	0	0	0	0	20	10.5	0	0	1	0.5	12	6.3
Block 3016, Block Group 3, Census Tract 17.70, Travis Coun	106	99	93.4	89	84	8	7.5	0	0	8	7.5	0	0	1	0.9	0	0
Block 1000, Block Group 1, Census Tract 17.72, Travis Coun	184	113	61.4	131	71.2	6	3.3	0	0	5	2.7	0	0	34	18.5	8	4.3
Block 1001, Block Group 1, Census Tract 17.72, Travis Coun	3	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	3	100
Block 1002, Block Group 1, Census Tract 17.72, Travis Coun	111	78	70.3	100	90.1	2	1.8	0	0	5	4.5	0	0	2	1.8	2	1.8
Block 1004, Block Group 1, Census Tract 17.72, Travis Coun	3	3	100.0	1	33.3	0	0	0	0	0	0	0	0	0	0	2	66.7
Block 1005, Block Group 1, Census Tract 17.72, Travis Coun	10	0	0.0	10	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1006, Block Group 1, Census Tract 17.72, Travis Coun	1	1	100.0	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1007, Block Group 1, Census Tract 17.72, Travis Coun	4	3	75.0	4	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1009, Block Group 1, Census Tract 17.72, Travis Coun	30	21	70.0	29	96.7	0	0	0	0	0	0	0	0	0	0	1	3.3
Block 1010, Block Group 1, Census Tract 17.72, Travis Coun	2	1	50.0	1	50	0	0	0	0	0	0	0	0	0	0	1	50
Block 1011, Block Group 1, Census Tract 17.72, Travis Coun	145	97	66.9	102	70.3	10	6.9	0	0	6	4.1	1	0.7	19	13.1	7	4.8
Block 1012, Block Group 1, Census Tract 17.72, Travis Coun	32	28	87.5	28	87.5	0	0	0	0	1	3.1	0	0	3	9.4	0	0
Block 1013, Block Group 1, Census Tract 17.72, Travis Coun	52	41	78.8	40	76.9	3	5.8	0	0	6	11.5	0	0	1	1.9	2	3.8
Block 1014, Block Group 1, Census Tract 17.72, Travis Coun	97	73	75.3	73	75.3	0	0	0	0	19	19.6	0	0	2	2.1	3	3.1
Block 1015, Block Group 1, Census Tract 17.72, Travis Coun	21	9	42.9	13	61.9	0	0	0	0	0	0	0	0	7	33.3	1	4.8
Block 1016, Block Group 1, Census Tract 17.72, Travis Coun	23	16	69.6	13	56.5	0	0	0	0	5	21.7	0	0	5	21.7	0	0
Block 1017, Block Group 1, Census Tract 17.72, Travis Coun	89	67	75.3	76	85.4	0	0	1	1.1	6	6.7	0	0	2	2.2	4	4.5
Block 1018, Block Group 1, Census Tract 17.72, Travis Coun	50	31	62.0	47	94	2	4	0	0	0	0	0	0	1	2	0	0
Block 1019, Block Group 1, Census Tract 17.72, Travis Coun	56	34	60.7	50	89.3	0	0	0	0	2	3.6	0	0	0	0	4	7.1
Block 1020, Block Group 1, Census Tract 17.72, Travis Coun	75	41	54.7	55	73.3	4	5.3	0	0	8	10.7	0	0	6	8	2	2.7
Block 1021, Block Group 1, Census Tract 17.72, Travis Coun	28	20	71.4	21	75	0	0	0	0	7	25	0	0	0	0	0	0
Block 1022, Block Group 1, Census Tract 17.72, Travis Coun	23	10	43.5	13	56.5	0	0	0	0	2	8.7	0	0	8	34.8	0	0
Block 1023, Block Group 1, Census Tract 17.72, Travis Coun	32	28	87.5	32	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1025, Block Group 1, Census Tract 17.72, Travis Coun	144	125	86.8	129	89.6	2	1.4	0	0	0	0	5	3.5	4	2.8	4	2.8
Block 1026, Block Group 1, Census Tract 17.72, Travis Coun	21	20	95.2	18	85.7	3	14.3	0	0	0	0	0	0	0	0	0	0
Block 1027, Block Group 1, Census Tract 17.72, Travis Coun	3	2	66.7	3	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1028, Block Group 1, Census Tract 17.72, Travis Coun	22	14	63.6	16	72.7	0	0	2	9.1	0	0	0	0	4	18.2	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area																	
Block 1029, Block Group 1, Census Tract 17.72, Travis Coun	41	39	95.1	41	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1032, Block Group 1, Census Tract 17.72, Travis Coun	6	6	100.0	4	66.7	2	33.3	0	0	0	0	0	0	0	0	0	0
Block 2000, Block Group 2, Census Tract 17.74, Travis Coun	439	264	60.1	298	67.9	34	7.7	4	0.9	41	9.3	0	0	47	10.7	15	3.4
Block 2001, Block Group 2, Census Tract 17.74, Travis Coun	41	19	46.3	23	56.1	0	0	0	0	7	17.1	0	0	11	26.8	0	0
Block 2002, Block Group 2, Census Tract 17.74, Travis Coun	164	78	47.6	104	63.4	22	13.4	0	0	11	6.7	0	0	20	12.2	7	4.3
Block 2003, Block Group 2, Census Tract 17.74, Travis Coun	30	13	43.3	12	40	0	0	0	0	6	20	0	0	8	26.7	4	13.3
Block 2004, Block Group 2, Census Tract 17.74, Travis Coun	64	38	59.4	47	73.4	0	0	0	0	7	10.9	0	0	10	15.6	0	0
Block 2005, Block Group 2, Census Tract 17.74, Travis Coun	122	75	61.5	96	78.7	11	9	0	0	2	1.6	0	0	5	4.1	8	6.6
Block 2006, Block Group 2, Census Tract 17.74, Travis Coun	63	33	52.4	46	73	4	6.3	2	3.2	5	7.9	0	0	6	9.5	0	0
Block 2007, Block Group 2, Census Tract 17.74, Travis Coun	175	119	68.0	111	63.4	17	9.7	1	0.6	8	4.6	0	0	37	21.1	1	0.6
Block 2008, Block Group 2, Census Tract 17.74, Travis Coun	75	35	46.7	60	80	7	9.3	1	1.3	0	0	2	2.7	5	6.7	0	0
Block 2009, Block Group 2, Census Tract 17.74, Travis Coun	23	18	78.3	19	82.6	0	0	0	0	3	13	0	0	1	4.3	0	0
Block 2010, Block Group 2, Census Tract 17.74, Travis Coun	51	29	56.9	47	92.2	3	5.9	0	0	0	0	0	0	0	0	1	2
Block 2011, Block Group 2, Census Tract 17.74, Travis Coun	510	402	78.8	419	82.2	9	1.8	0	0	41	8	0	0	17	3.3	24	4.7
Block 2012, Block Group 2, Census Tract 17.74, Travis Coun	116	91	78.4	99	85.3	0	0	0	0	16	13.8	0	0	0	0	1	0.9
Block 2013, Block Group 2, Census Tract 17.74, Travis Coun	42	27	64.3	39	92.9	0	0	0	0	1	2.4	0	0	1	2.4	1	2.4
Block 2014, Block Group 2, Census Tract 17.74, Travis Coun	46	31	67.4	27	58.7	6	13	0	0	9	19.6	0	0	4	8.7	0	0
Block 2015, Block Group 2, Census Tract 17.74, Travis Coun	38	20	52.6	38	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2016, Block Group 2, Census Tract 17.74, Travis Coun	27	17	63.0	19	70.4	1	3.7	1	3.7	0	0	0	0	3	11.1	3	11.1
Block 2017, Block Group 2, Census Tract 17.74, Travis Coun	42	42	100.0	33	78.6	0	0	0	0	9	21.4	0	0	0	0	0	0
Block 2018, Block Group 2, Census Tract 17.74, Travis Coun	520	322	61.9	395	76	25	4.8	7	1.3	20	3.8	2	0.4	33	6.3	38	7.3
Block 2019, Block Group 2, Census Tract 17.74, Travis Coun	40	23	57.5	34	85	0	0	0	0	0	0	0	0	6	15	0	0
Block 2020, Block Group 2, Census Tract 17.74, Travis Coun	45	28	62.2	34	75.6	1	2.2	1	2.2	0	0	0	0	5	11.1	4	8.9
Block 2021, Block Group 2, Census Tract 17.74, Travis Coun	56	27	48.2	29	51.8	0	0	0	0	12	21.4	0	0	15	26.8	0	0
Block 2022, Block Group 2, Census Tract 17.74, Travis Coun	52	30	57.7	38	73.1	4	7.7	0	0	0	0	0	0	8	15.4	2	3.8
Block 2023, Block Group 2, Census Tract 17.74, Travis Coun	76	42	55.3	52	68.4	2	2.6	0	0	10	13.2	0	0	12	15.8	0	0
Block 2025, Block Group 2, Census Tract 17.74, Travis Coun	33	31	93.9	26	78.8	0	0	0	0	7	21.2	0	0	0	0	0	0
Block 2026, Block Group 2, Census Tract 17.74, Travis Coun	111	66	59.5	80	72.1	18	16.2	1	0.9	0	0	0	0	8	7.2	4	3.6
Block 2027, Block Group 2, Census Tract 17.74, Travis Coun	66	50	75.8	49	74.2	0	0	0	0	5	7.6	0	0	12	18.2	0	0
Block 2028, Block Group 2, Census Tract 17.74, Travis Coun	88	49	55.7	51	58	10	11.4	0	0	0	0	1	1.1	24	27.3	2	2.3
Block 2029, Block Group 2, Census Tract 17.74, Travis Coun	81	61	75.3	60	74.1	4	4.9	0	0	6	7.4	0	0	6	7.4	5	6.2
Block 2030, Block Group 2, Census Tract 17.74, Travis Coun	70	57	81.4	54	77.1	5	7.1	1	1.4	1	1.4	0	0	8	11.4	1	1.4
Block 2031, Block Group 2, Census Tract 17.74, Travis Coun	272	161	59.2	202	74.3	10	3.7	1	0.4	18	6.6	1	0.4	36	13.2	4	1.5

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Table E-1: Race by Block within Study Area																	
Block 2033, Block Group 2, Census Tract 17.74, Travis Coun	84	65	77.4	64	76.2	9	10.7	0	0	4	4.8	0	0	6	7.1	1	1.2
Block 2035, Block Group 2, Census Tract 17.74, Travis Coun	42	30	71.4	36	85.7	0	0	0	0	4	9.5	0	0	2	4.8	0	0
Block 2036, Block Group 2, Census Tract 17.74, Travis Coun	53	40	75.5	49	92.5	0	0	0	0	4	7.5	0	0	0	0	0	0
Block 2037, Block Group 2, Census Tract 17.74, Travis Coun	60	53	88.3	53	88.3	0	0	0	0	2	3.3	0	0	4	6.7	1	1.7
Block 2038, Block Group 2, Census Tract 17.74, Travis Coun	106	80	75.5	92	86.8	3	2.8	0	0	3	2.8	0	0	2	1.9	6	5.7
Block 2039, Block Group 2, Census Tract 17.74, Travis Coun	74	39	52.7	48	64.9	1	1.4	0	0	5	6.8	0	0	15	20.3	5	6.8
Block 2040, Block Group 2, Census Tract 17.74, Travis Coun	78	56	71.8	54	69.2	0	0	0	0	9	11.5	0	0	15	19.2	0	0
Block 2043, Block Group 2, Census Tract 17.74, Travis Coun	154	100	64.9	116	75.3	7	4.5	0	0	0	0	0	0	23	14.9	8	5.2
Block 2044, Block Group 2, Census Tract 17.74, Travis Coun	48	15	31.3	33	68.8	3	6.3	0	0	0	0	0	0	11	22.9	1	2.1
Block 2045, Block Group 2, Census Tract 17.74, Travis Coun	75	46	61.3	64	85.3	1	1.3	0	0	2	2.7	0	0	6	8	2	2.7
Block 2046, Block Group 2, Census Tract 17.74, Travis Coun	93	68	73.1	68	73.1	2	2.2	0	0	9	9.7	0	0	12	12.9	2	2.2
Block 2049, Block Group 2, Census Tract 17.74, Travis Coun	107	63	58.9	64	59.8	7	6.5	0	0	4	3.7	0	0	26	24.3	6	5.6
Block 2052, Block Group 2, Census Tract 17.74, Travis Coun	55	22	40.0	42	76.4	0	0	0	0	0	0	0	0	13	23.6	0	0
Block 2053, Block Group 2, Census Tract 17.74, Travis Coun	48	32	66.7	37	77.1	3	6.3	0	0	4	8.3	0	0	4	8.3	0	0
Block 2054, Block Group 2, Census Tract 17.74, Travis Coun	36	20	55.6	26	72.2	1	2.8	2	5.6	0	0	0	0	3	8.3	4	11.1
Block 2056, Block Group 2, Census Tract 17.74, Travis Coun	51	42	82.4	40	78.4	1	2	0	0	5	9.8	0	0	4	7.8	1	2
Block 2059, Block Group 2, Census Tract 17.74, Travis Coun	49	34	69.4	29	59.2	3	6.1	0	0	8	16.3	0	0	7	14.3	2	4.1
Block 2060, Block Group 2, Census Tract 17.74, Travis Coun	119	89	74.8	89	74.8	4	3.4	0	0	4	3.4	0	0	18	15.1	4	3.4
Block 3000, Block Group 3, Census Tract 17.74, Travis Coun	131	112	85.5	115	87.8	5	3.8	1	0.8	1	0.8	0	0	4	3.1	5	3.8
Block 3001, Block Group 3, Census Tract 17.74, Travis Coun	90	81	90.0	88	97.8	0	0	0	0	1	1.1	0	0	1	1.1	0	0
Block 3002, Block Group 3, Census Tract 17.74, Travis Coun	56	48	85.7	55	98.2	0	0	0	0	0	0	0	0	1	1.8	0	0
Block 3003, Block Group 3, Census Tract 17.74, Travis Coun	81	69	85.2	75	92.6	0	0	0	0	0	0	0	0	6	7.4	0	0
Block 3004, Block Group 3, Census Tract 17.74, Travis Coun	134	119	88.8	109	81.3	11	8.2	0	0	10	7.5	0	0	2	1.5	2	1.5
Block 3005, Block Group 3, Census Tract 17.74, Travis Coun	76	61	80.3	65	85.5	1	1.3	0	0	3	3.9	0	0	6	7.9	1	1.3
Block 3007, Block Group 3, Census Tract 17.74, Travis Coun	88	80	90.9	82	93.2	2	2.3	0	0	3	3.4	0	0	0	0	1	1.1
Block 3008, Block Group 3, Census Tract 17.74, Travis Coun	37	34	91.9	33	89.2	0	0	0	0	4	10.8	0	0	0	0	0	0
Block 3009, Block Group 3, Census Tract 17.74, Travis Coun	26	13	50.0	26	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3010, Block Group 3, Census Tract 17.74, Travis Coun	24	21	87.5	24	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3011, Block Group 3, Census Tract 17.74, Travis Coun	79	65	82.3	63	79.7	3	3.8	0	0	6	7.6	0	0	5	6.3	2	2.5
Block 3012, Block Group 3, Census Tract 17.74, Travis Coun	14	12	85.7	14	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3013, Block Group 3, Census Tract 17.74, Travis Coun	29	29	100.0	29	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 3014, Block Group 3, Census Tract 17.74, Travis Coun	61	53	86.9	55	90.2	2	3.3	1	1.6	3	4.9	0	0	0	0	0	0
Block 3015, Block Group 3, Census Tract 17.74, Travis Coun	39	33	84.6	13	33.3	4	10.3	0	0	20	51.3	0	0	1	2.6	1	2.6

Appendix E: Census Data

Table E-1: Race by Block within Study Area																	
Block 3016, Block Group 3, Census Tract 17.74, Travis Coun	37	29	78.4	33	89.2	2	5.4	0	0	2	5.4	0	0	0	0	0	0
Block 3017, Block Group 3, Census Tract 17.74, Travis Coun	30	28	93.3	27	90	0	0	0	0	3	10	0	0	0	0	0	0
Block 3018, Block Group 3, Census Tract 17.74, Travis Coun	147	122	83.0	119	81	5	3.4	0	0	8	5.4	3	2	3	2	9	6.1
Block 3019, Block Group 3, Census Tract 17.74, Travis Coun	42	22	52.4	37	88.1	2	4.8	0	0	0	0	0	0	0	0	3	7.1
Block 3020, Block Group 3, Census Tract 17.74, Travis Coun	49	42	85.7	47	95.9	0	0	0	0	2	4.1	0	0	0	0	0	0
Block 3021, Block Group 3, Census Tract 17.74, Travis Coun	81	71	87.7	70	86.4	3	3.7	0	0	5	6.2	2	2.5	1	1.2	0	0
Block 3022, Block Group 3, Census Tract 17.74, Travis Coun	67	57	85.1	35	52.2	5	7.5	0	0	19	28.4	0	0	4	6	4	6
Block 3023, Block Group 3, Census Tract 17.74, Travis Coun	72	55	76.4	48	66.7	3	4.2	2	2.8	10	13.9	0	0	9	12.5	0	0
Block 3024, Block Group 3, Census Tract 17.74, Travis Coun	167	121	72.5	150	89.8	10	6	0	0	1	0.6	0	0	6	3.6	0	0
Block 3025, Block Group 3, Census Tract 17.74, Travis Coun	19	13	68.4	13	68.4	0	0	0	0	2	10.5	0	0	4	21.1	0	0
Block 3026, Block Group 3, Census Tract 17.74, Travis Coun	40	27	67.5	38	95	0	0	1	2.5	0	0	1	2.5	0	0	0	0
Block 3027, Block Group 3, Census Tract 17.74, Travis Coun	36	28	77.8	32	88.9	0	0	0	0	4	11.1	0	0	0	0	0	0
Block 3028, Block Group 3, Census Tract 17.74, Travis Coun	81	57	70.4	76	93.8	0	0	0	0	0	0	0	0	5	6.2	0	0
Block 3029, Block Group 3, Census Tract 17.74, Travis Coun	75	56	74.7	66	88	0	0	1	1.3	1	1.3	0	0	3	4	4	5.3
Block 3030, Block Group 3, Census Tract 17.74, Travis Coun	34	26	76.5	24	70.6	0	0	0	0	7	20.6	0	0	0	0	3	8.8
Block 3031, Block Group 3, Census Tract 17.74, Travis Coun	32	32	100.0	24	75	1	3.1	0	0	5	15.6	0	0	0	0	2	6.3
Block 3032, Block Group 3, Census Tract 17.74, Travis Coun	66	43	65.2	55	83.3	3	4.5	0	0	8	12.1	0	0	0	0	0	0
Block 3033, Block Group 3, Census Tract 17.74, Travis Coun	52	43	82.7	42	80.8	0	0	0	0	10	19.2	0	0	0	0	0	0
Block 3034, Block Group 3, Census Tract 17.74, Travis Coun	42	32	76.2	40	95.2	0	0	0	0	1	2.4	0	0	0	0	1	2.4
Block 1000, Block Group 1, Census Tract 17.75, Travis Coun	238	189	79.4	215	90.3	1	0.4	0	0	15	6.3	0	0	4	1.7	3	1.3
Block 1001, Block Group 1, Census Tract 17.75, Travis Coun	71	54	76.1	64	90.1	3	4.2	0	0	0	0	0	0	2	2.8	2	2.8
Block 1002, Block Group 1, Census Tract 17.75, Travis Coun	42	31	73.8	41	97.6	0	0	0	0	1	2.4	0	0	0	0	0	0
Block 1003, Block Group 1, Census Tract 17.75, Travis Coun	35	35	100.0	35	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1004, Block Group 1, Census Tract 17.75, Travis Coun	124	118	95.2	114	91.9	9	7.3	0	0	0	0	0	0	1	0.8	0	0
Block 1005, Block Group 1, Census Tract 17.75, Travis Coun	344	313	91.0	313	91	13	3.8	0	0	13	3.8	4	1.2	0	0	1	0.3
Block 1007, Block Group 1, Census Tract 17.75, Travis Coun	449	400	89.1	391	87.1	5	1.1	0	0	38	8.5	0	0	6	1.3	9	2
Block 1009, Block Group 1, Census Tract 17.75, Travis Coun	16	11	68.8	8	50	0	0	0	0	3	18.8	0	0	5	31.3	0	0
Block 1010, Block Group 1, Census Tract 17.75, Travis Coun	96	69	71.9	69	71.9	0	0	0	0	14	14.6	0	0	6	6.3	7	7.3
Block 1011, Block Group 1, Census Tract 17.75, Travis Coun	47	38	80.9	32	68.1	8	17	0	0	5	10.6	0	0	1	2.1	1	2.1
Block 1012, Block Group 1, Census Tract 17.75, Travis Coun	20	14	70.0	19	95	0	0	0	0	0	0	0	0	0	0	1	5
Block 1013, Block Group 1, Census Tract 17.75, Travis Coun	64	48	75.0	51	79.7	0	0	0	0	9	14.1	0	0	0	0	4	6.3
Block 1014, Block Group 1, Census Tract 17.75, Travis Coun	40	35	87.5	25	62.5	0	0	0	0	4	10	0	0	5	12.5	6	15
Block 1017, Block Group 1, Census Tract 17.75, Travis Coun	148	132	89.2	133	89.9	4	2.7	0	0	8	5.4	0	0	0	0	3	2

Appendix E: Census Data

Table E-1: Race by Block within Study Area																	
Block 1019, Block Group 1, Census Tract 17.75, Travis Coun	24	19	79.2	21	87.5	0	0	0	0	3	12.5	0	0	0	0	0	0
Block 1020, Block Group 1, Census Tract 17.75, Travis Coun	167	138	82.6	136	81.4	11	6.6	0	0	18	10.8	0	0	0	0	2	1.2
Block 1021, Block Group 1, Census Tract 17.75, Travis Coun	54	40	74.1	43	79.6	3	5.6	0	0	6	11.1	0	0	2	3.7	0	0
Block 1022, Block Group 1, Census Tract 17.75, Travis Coun	300	283	94.3	291	97	5	1.7	0	0	0	0	0	0	4	1.3	0	0
Block 1024, Block Group 1, Census Tract 17.75, Travis Coun	23	21	91.3	21	91.3	2	8.7	0	0	0	0	0	0	0	0	0	0
Block 1025, Block Group 1, Census Tract 17.75, Travis Coun	42	29	69.0	38	90.5	0	0	4	9.5	0	0	0	0	0	0	0	0
Block 1026, Block Group 1, Census Tract 17.75, Travis Coun	90	71	78.9	87	96.7	0	0	0	0	0	0	0	0	3	3.3	0	0
Block 1027, Block Group 1, Census Tract 17.75, Travis Coun	1	0	0.0	0	0	0	0	0	0	0	0	0	0	1	100	0	0
Block 1030, Block Group 1, Census Tract 17.75, Travis Coun	131	112	85.5	117	89.3	0	0	0	0	11	8.4	0	0	2	1.5	1	0.8
Block 1031, Block Group 1, Census Tract 17.75, Travis Coun	121	110	90.9	103	85.1	0	0	0	0	8	6.6	0	0	2	1.7	8	6.6
Block 1032, Block Group 1, Census Tract 17.75, Travis Coun	66	62	93.9	57	86.4	3	4.5	0	0	0	0	0	0	0	0	6	9.1
Block 1033, Block Group 1, Census Tract 17.75, Travis Coun	119	75	63.0	104	87.4	0	0	0	0	0	0	0	0	12	10.1	3	2.5
Block 1034, Block Group 1, Census Tract 17.75, Travis Coun	81	75	92.6	77	95.1	0	0	2	2.5	1	1.2	0	0	0	0	1	1.2
Block 1035, Block Group 1, Census Tract 17.75, Travis Coun	46	38	82.6	33	71.7	2	4.3	6	13	0	0	0	0	0	0	5	10.9
Block 1036, Block Group 1, Census Tract 17.75, Travis Coun	34	34	100.0	34	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1037, Block Group 1, Census Tract 17.75, Travis Coun	72	66	91.7	67	93.1	4	5.6	0	0	1	1.4	0	0	0	0	0	0
Block 1038, Block Group 1, Census Tract 17.75, Travis Coun	62	51	82.3	55	88.7	0	0	0	0	4	6.5	0	0	2	3.2	1	1.6
Block 1039, Block Group 1, Census Tract 17.75, Travis Coun	36	32	88.9	34	94.4	0	0	0	0	2	5.6	0	0	0	0	0	0
Block 1041, Block Group 1, Census Tract 17.75, Travis Coun	7	5	71.4	7	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 1042, Block Group 1, Census Tract 17.75, Travis Coun	17	16	94.1	8	47.1	4	23.5	0	0	5	29.4	0	0	0	0	0	0
Block 1043, Block Group 1, Census Tract 17.75, Travis Coun	83	63	75.9	58	69.9	0	0	0	0	17	20.5	0	0	8	9.6	0	0
Block 1044, Block Group 1, Census Tract 17.75, Travis Coun	89	72	80.9	84	94.4	2	2.2	0	0	2	2.2	0	0	1	1.1	0	0
Block 1045, Block Group 1, Census Tract 17.75, Travis Coun	87	79	90.8	82	94.3	0	0	0	0	4	4.6	0	0	0	0	1	1.1
Block 1047, Block Group 1, Census Tract 17.75, Travis Coun	281	228	81.1	190	67.6	6	2.1	1	0.4	62	22.1	0	0	12	4.3	10	3.6
Block 1048, Block Group 1, Census Tract 17.75, Travis Coun	262	228	87.0	189	72.1	4	1.5	2	0.8	48	18.3	0	0	3	1.1	16	6.1
Block 1049, Block Group 1, Census Tract 17.75, Travis Coun	79	61	77.2	38	48.1	6	7.6	0	0	25	31.6	0	0	4	5.1	6	7.6
Block 1050, Block Group 1, Census Tract 17.75, Travis Coun	28	19	67.9	19	67.9	0	0	0	0	3	10.7	0	0	2	7.1	4	14.3
Block 1051, Block Group 1, Census Tract 17.75, Travis Coun	65	63	96.9	45	69.2	0	0	0	0	17	26.2	0	0	0	0	3	4.6
Block 2000, Block Group 2, Census Tract 17.75, Travis Coun	54	48	88.9	50	92.6	1	1.9	0	0	0	0	0	0	0	0	3	5.6
Block 2001, Block Group 2, Census Tract 17.75, Travis Coun	37	34	91.9	36	97.3	1	2.7	0	0	0	0	0	0	0	0	0	0
Block 2002, Block Group 2, Census Tract 17.75, Travis Coun	47	45	95.7	45	95.7	0	0	2	4.3	0	0	0	0	0	0	0	0
Block 2003, Block Group 2, Census Tract 17.75, Travis Coun	61	50	82.0	55	90.2	0	0	1	1.6	0	0	0	0	1	1.6	4	6.6
Block 2004, Block Group 2, Census Tract 17.75, Travis Coun	31	21	67.7	28	90.3	3	9.7	0	0	0	0	0	0	0	0	0	0

Appendix E: Census Data

Table E-1: Race by Block within Study Area																		
Block 2005, Block Group 2, Census Tract 17.75, Travis Coun	78	69	88.5	75	96.2	0	0	1	1.3	1	1.3	0	0	0	0	1	1.3
Block 2006, Block Group 2, Census Tract 17.75, Travis Coun	74	59	79.7	65	87.8	0	0	0	0	0	0	0	0	9	12.2	0	0
Block 2007, Block Group 2, Census Tract 17.75, Travis Coun	41	40	97.6	37	90.2	0	0	1	2.4	0	0	0	0	0	0	3	7.3
Block 2008, Block Group 2, Census Tract 17.75, Travis Coun	39	33	84.6	38	97.4	1	2.6	0	0	0	0	0	0	0	0	0	0
Block 2009, Block Group 2, Census Tract 17.75, Travis Coun	46	42	91.3	43	93.5	1	2.2	0	0	0	0	0	0	0	0	2	4.3
Block 2010, Block Group 2, Census Tract 17.75, Travis Coun	31	25	80.6	31	100	0	0	0	0	0	0	0	0	0	0	0	0
Block 2011, Block Group 2, Census Tract 17.75, Travis Coun	57	50	87.7	49	86	8	14	0	0	0	0	0	0	0	0	0	0
Block 2012, Block Group 2, Census Tract 17.75, Travis Coun	85	66	77.6	67	78.8	0	0	7	8.2	2	2.4	0	0	8	9.4	1	1.2
Block 2013, Block Group 2, Census Tract 17.75, Travis Coun	24	15	62.5	18	75	2	8.3	0	0	0	0	1	4.2	1	4.2	2	8.3
Block 2014, Block Group 2, Census Tract 17.75, Travis Coun	67	48	71.6	59	88.1	3	4.5	1	1.5	1	1.5	0	0	0	0	3	4.5

Source: US Census, 2010. Summary File 1, "Race, Combinations of Two Races, and Not Hispanic or Latino" (QT-P4).

APPENDIX F
CAMPO REGIONAL TOLL ANALYSIS (2013) AND CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY TOLL POLICY (2014)

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CAMPO Regional Toll Network Analysis Update July 2013

The interconnected network of existing and planned toll roads and managed lanes form a regional toll network. Project sponsors, in accordance with the National Environmental Policy Act (NEPA), evaluate individual roadway projects to measure effects of toll roads and managed lanes on the environmental justice (EJ) population. The regional toll network, as a whole, needs to undergo the same analysis to determine its effect on the EJ population.

In April 2009, the Federal Highways Administration (FHWA) and the Texas Department of Transportation (TxDOT) issued joint guidance on conducting a Regional Toll Network Analysis. The guidance calls for the regional toll network analysis to be consistent with the Metropolitan Planning Organization (MPO) long-range transportation plan. Significant changes to the MPO plan trigger the need for a regional toll analysis update. This update to the regional toll network analysis is consistent with the Capital Area Metropolitan Planning Organization (CAMPO) 2035 Regional Transportation Plan, as amended through June 10, 2013, with the exception of the March 2013 amendment by the CAMPO Transportation Policy Board to add Burnet County to the MPO. Burnet County is not yet included in CAMPO's travel demand model, so this analysis currently cannot be conducted for Burnet County. Burnet County will be incorporated into the Regional Toll Network Analysis that will be conducted for the CAMPO 2040 Plan update. Currently there are not any tolled roads or lanes in Burnet County and none are planned.

This update was triggered by the June 10, 2013 amendment to the CAMPO 2035 Plan for SH 71E. This amendment adds 1 tolled lane in each direction on SH 71 E from Presidential Blvd. to east of SH 130, with overpasses at FM 973 and SH 130. Bicyclists are accommodated on a shared use path or shoulders on the frontage roads. Pedestrians are accommodated on sidewalks.

Changes from the initial Regional Toll Analysis as a result of this update are summarized as follows:

- Incorporated the proposed SH 71 E project into the CAMPO travel demand model based on the CAMPO 2035 Plan amendment and current TxDOT assumptions;
- Refined the travel demand model network coding for other existing/planned toll facilities to reflect the most currently available information and consistency with the CAMPO 2035 Plan;
- Refined the travel demand model network coding to reflect all applicable amendments to the CAMPO 2035 Plan through June 2013, excluding the addition of Burnet County;
- Used the latest available CAMPO travel demand model with an updated traffic assignment procedure by time period (resulting in the separate AM and Midday Travel Time Analysis in Table 3A and 3B);
- Updated texts and figures under the "Cumulative Economic Impact to Individuals" section, reflecting the revised travel demand model outputs, as well as the updated median family income and poverty level derived using 2010 data , and also with updated average toll rates and annual toll costs which referenced the historical 2010 rates and 2035 rates projected from current 2013 values;
- Updated text, figures and maps under the "Identification of Potential Users" section, reflecting revised travel demand model outputs;

- Updated the toll rates for existing toll facilities, and the lane miles inside, outside, and adjacent to EJ areas, and;
- Updated other text where appropriate.

In general, the results from this update are substantially similar to the initial analysis. Some noticeable changes are observed, which include the estimates of the cumulative economic impact to individuals, primarily due to a lower estimate of tolled traffic in the current CAMPO model. Most of these minor differences are related to changes in the underlying highway network and the new time-of-day assignment procedures utilized in the CAMPO model. Note that differences, however, do not alter the relationship between the EJ zones and non-EJ zones and that the findings are generally consistent with the initial analysis.

In order to ensure that the updated Regional Toll Network Analysis is consistent with the CAMPO 2035 Regional Transportation Plan, the analysis uses the 2035 Plan defined Environmental Justice Areas and thresholds.

The network analysis uses the following elements in its evaluation of the potential effects of tolling on the EJ population:

- CAMPO EJ Areas
- Transportation System
- Lane Miles
- Travel Time
- Methods of Toll Collection
- Toll Policies
- Transit Usage
- Limited English Proficiency (LEP)
- Growth of the Regional Toll Network
- Estimation of the Cumulative Economic Impact to Individuals
- Identification of Potential Users
- Land Use Considerations
- Air Quality Considerations
- Benefits of Implementing the Planned Transportation System

CAMPO EJ Areas

Identifying EJ areas helps to ensure the transportation planning process addresses effects to the EJ population. The EJ areas (or TAZs) are adopted with each long range planning process, and so the data used to determine the EJ areas is different from the data used to determine the cumulative toll impacts in the region. CAMPO uses demographic data compiled by traffic analysis zone (TAZ) to identify EJ areas. Of the 1413 TAZs in the CAMPO area, 443 are EJ TAZs. EJ TAZs must meet one or more of the following thresholds:

"Low income" TAZs:

- Have at least 50% of the population living in families earning less than 80% of the county median family income: and/or
- Have at least 25% of the population with income falling below the 2009 federal poverty level for a family of three ($17,098 for a family of 3).

"Minority" TAZs have less than 50% of the population identifying themselves as "White, non-Hispanic".

CAMPO used the following data to identify EJ TAZs for the CAMPO 2035 Regional Transportation Plan:

- 2005 median family income levels provided by CAPCOG, based on the 2005 Bureau of Economic Analysis Data to calculate low-income thresholds;
- 2008 and 2009 poverty data from the Census Bureau to analyze poverty; and,
- 2005 ethnicity data, based on 2000 census data ethnicity ratios applied to 2005 population data.
- Data for a family of three is used because CAMPO travel demand model indicates that the average household size in the CAMPO region is 2.75 people in 2010 and 2.73 people in 2035. Rounding up to avoid partial people results in an average household size of 3.

CAMPO used 2005 data because it corresponded with the 2005 travel demand model base year used for the 2035 plan update and so ensured consistency between model, plan and toll analysis data. Since the poverty data is used for comparison purposes only, CAMPO used the most recent available during 2035 Plan development.

Transportation System

Map 1 shows the relationship between the EJ areas and the 2035 regional tolled and non-tolled roadway network. Figure 1 provides project details for the planned toll roads and managed lanes and maps 2 through 5 graphically demonstrate the implementation of the toll roads by the years 2010, 2015, 2025 and 2035.

Map 1: 2035 Roadway and Toll System for Environmental Justice Analysis

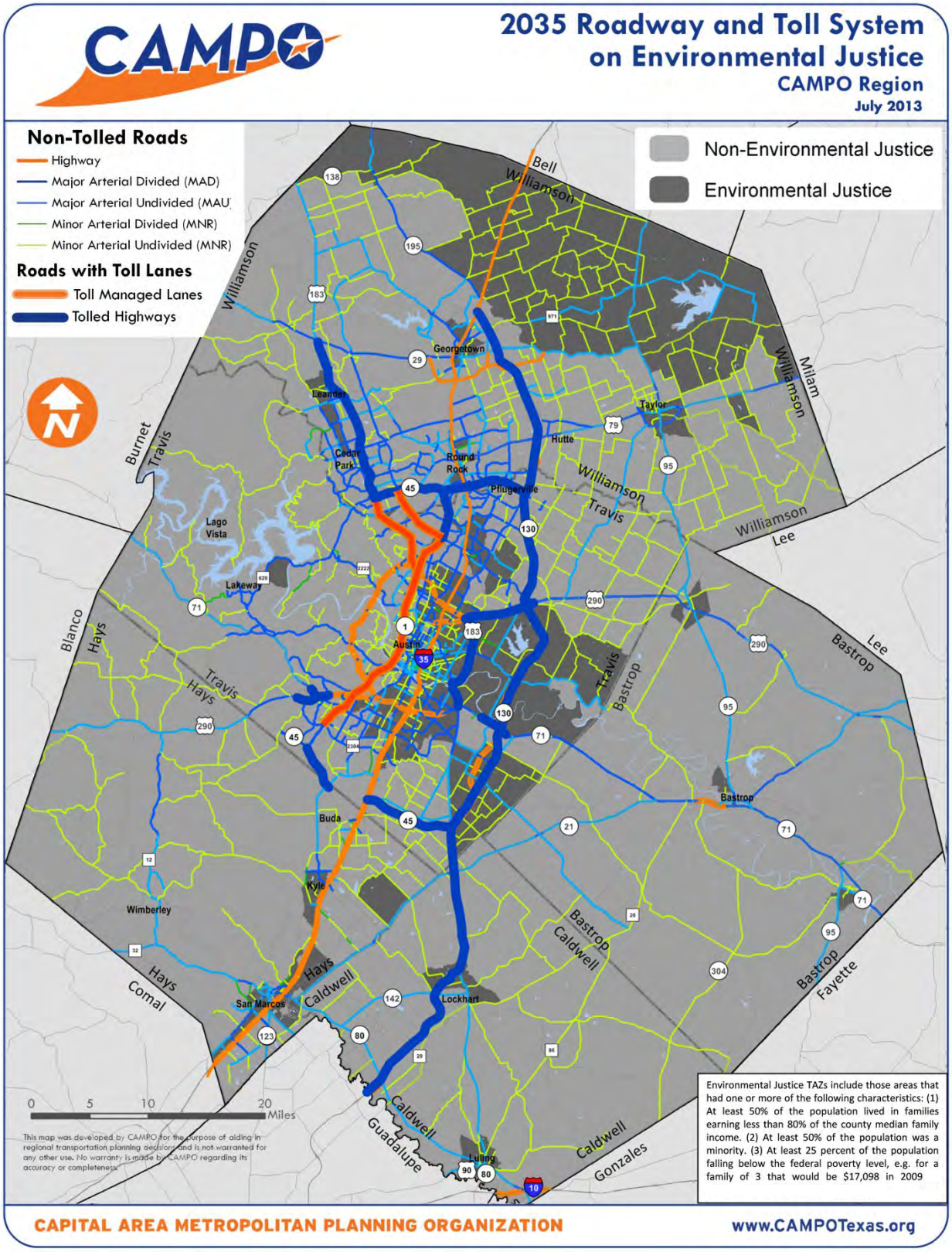
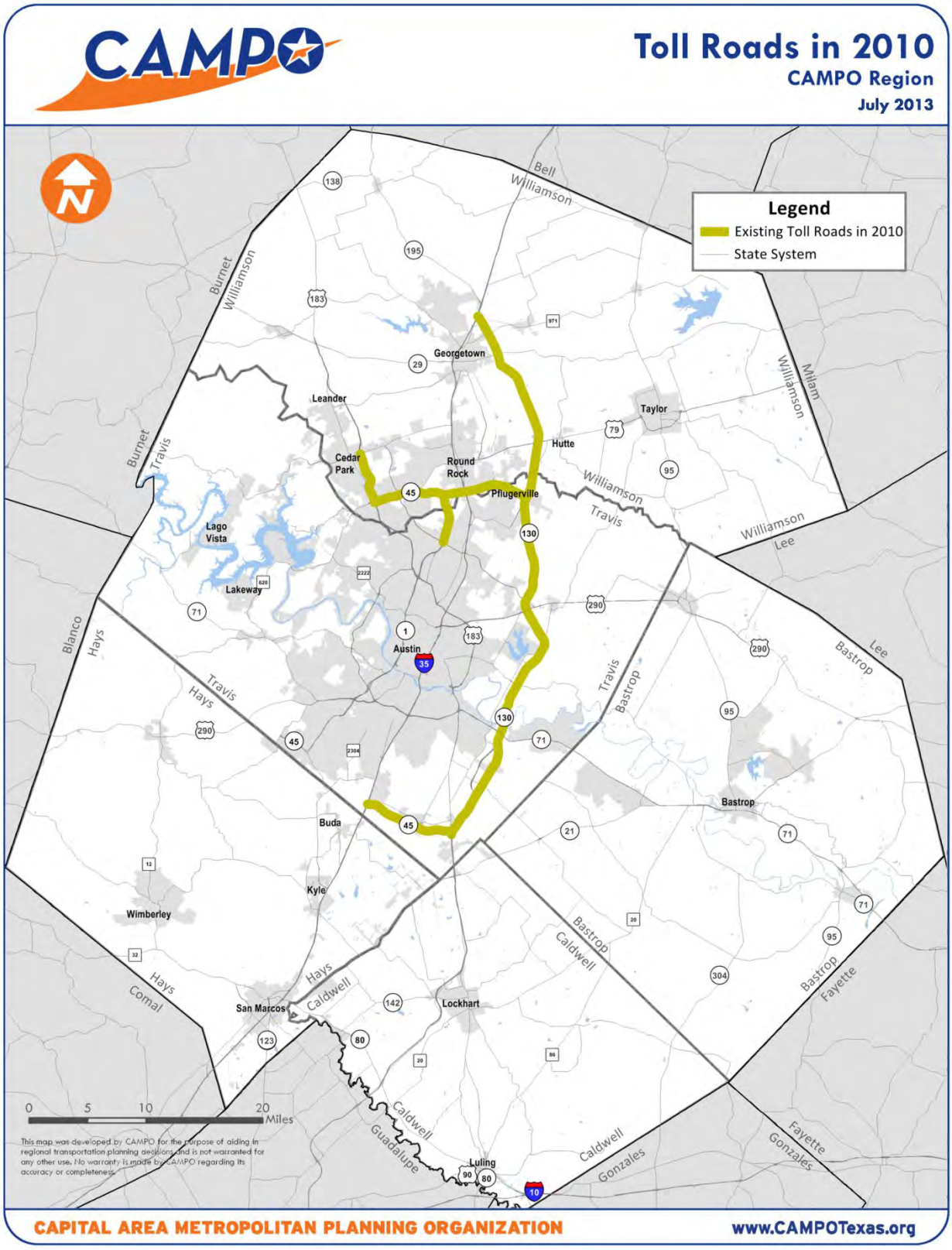


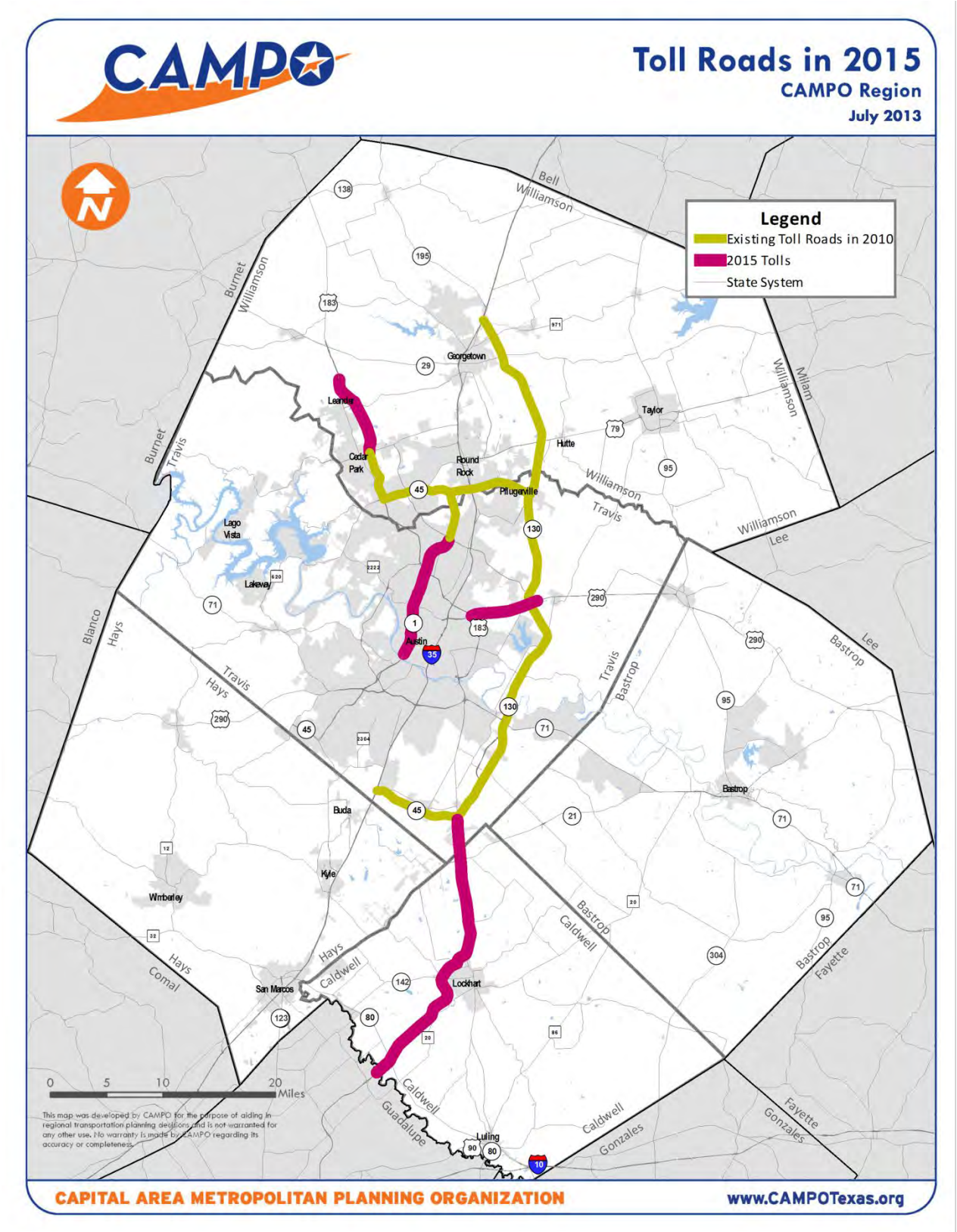
Figure 1: Planned Toll Roads and Managed Lanes

Sponsor	Project	Limits	Open Year	Description
CTRMA	183A North Extension Project:183A-2	0.1 miles N of FM 1431 to 1.5 miles N of RM 2243	2012	Engineering and construction of six tolled mainlanes, access ramps and a shared-use path. Existing continuous non-tolled frontage roads will be maintained.
CTRMA	183A North Extension Project:183A-3	1.5 miles N of RM 2243 to 0.4 miles S of S San Gabriel River	2013	Engineering and construction of six tolled mainlanes, access ramps, and a shared-use path. Existing continuous non-tolled frontage roads will be maintained.
TxDOT - TTA	SH 130, Segment 5	SH 45 SE-FM 1185	2012	Construct 4 lane tolled highway with intermittent frontage roads
TxDOT - TTA	SH 130, Segment 6	FM 1185 – IH 10	2012	Construct 4 lane tolled highway with intermittent frontage roads
TxDOT	US 290(E) direct connectors	US 290(E) at US 183(S)	2012	Construct interchange direct connectors
TxDOT/CTRMA	US 290(E)	East of US 183 to East of FM 734 (Parmer Ln.)	2015	Engineering, ROW acquisition, utility relocation and construction of 6 tolled mainlanes and 6 continuous, non-tolled access road lanes
TxDOT/CTRMA	SH 45 (SW)	Loop 1 to FM 1626	2020-2025	Construct 4 lane tolled highway
TxDOT/CTRMA	US 183(S)	US 290 to Boggy Creek (segment 1)	2017	Engineering, ROW acquisition, utility relocation and construction of ultimate 6 lane tolled highway with 3 lane non-tolled frontage roads in each direction. Project may be phased.
TxDOT/CTRMA	US 183(S)	Boggy Creek to Patton Ave. (segment 2)	2020-2025	Engineering, ROW acquisition, utility relocation and construction of ultimate 6 lane tolled highway with 3 lane non-tolled frontage roads in each direction. Project may be phased.
CTRMA	Loop 1 Managed Lanes (phase 1)	FM 734 to Cesar Chavez interchange	2015	Construct 1 managed lane in each direction
CTRMA	Loop 1 Managed Lanes (phase2)	Cesar Chavez – Slaughter Ln.	2017	Construct 1 managed lane in each direction
Williamson County	Parmer Ln/ FM 734 Express Lanes	RM 620 – Loop 1	2017	Add tolled express lanes (1 in each direction) in median
TxDOT	SH 71 East Mobility Improvements	Presidential Boulevard to East of SH 130	2016	Add two toll lanes, one in each direction, with overpasses at FM 973 and SH 130. Bicycle and pedestrian facilities will consist of either shared use paths or shoulders on the frontage roads and sidewalks.
TxDOT/CTRMA	SH 71 (W) ("Y" at Oak Hill)	Silver mine to US 290 W	2017	Engineering, ROW acquisition, and construction of 2 tolled direct connector bridges from US 290(W) and continuous non-tolled access road lanes.
TxDOT/CTRMA	US 290 (W) ("Y at Oak Hill")	Circle Drive to Joe Tanner Lane	2019	Engineering, ROW acquisition, utility relocation and construction of ultimate 6 lane tolled highway with 2 lane non-tolled frontage roads in each direction. Project may be phased.
Williamson County/ CTRMA	US 183 N	SH 29 to 183A	2026-2035	Construct 4 tolled mainlanes
TxDOT/CTRMA	US 183 (N) Express Lanes	RM 620 to Loop 1	2017	Construct 1 managed lane in each direction

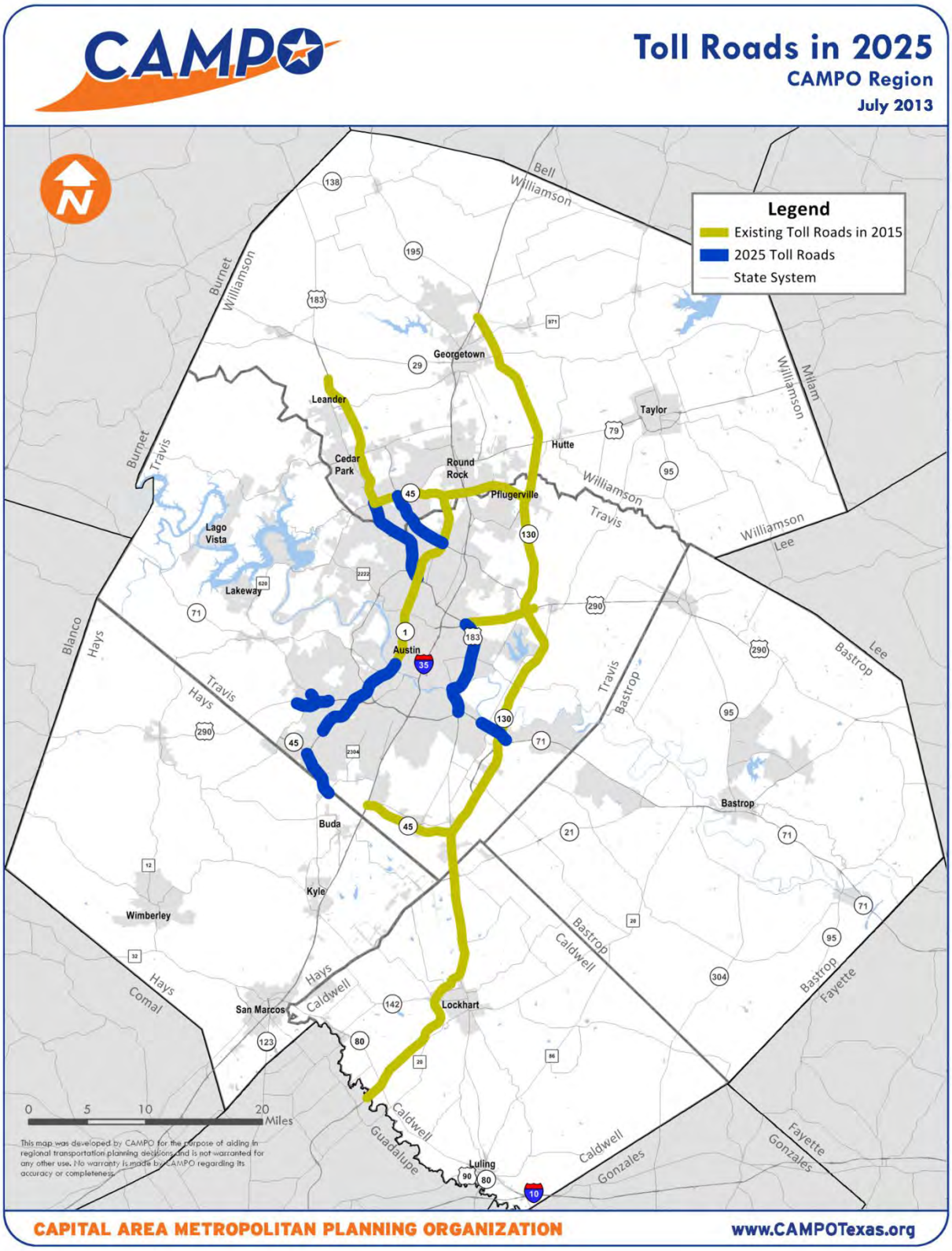
Map 2: Toll Roads in 2010



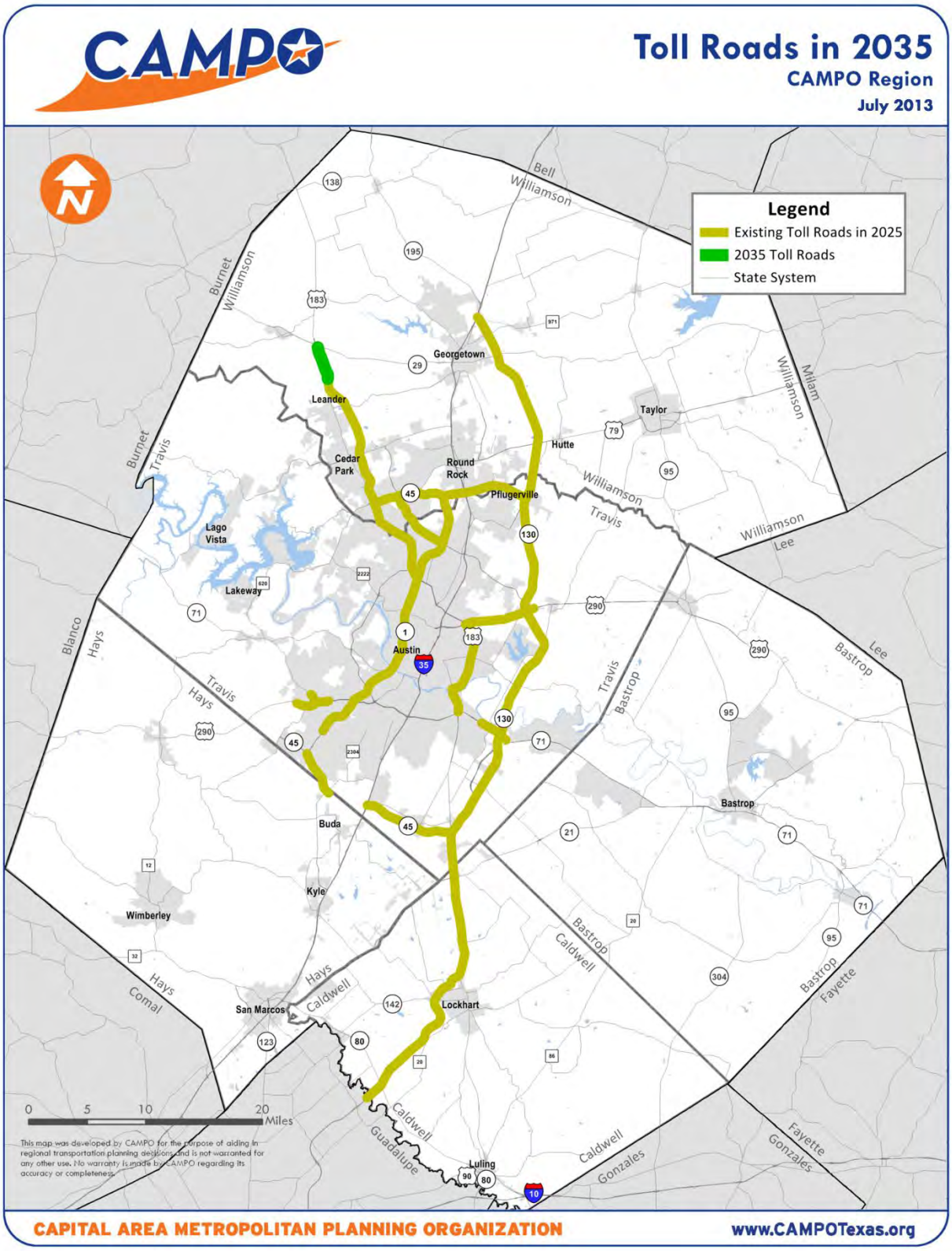
Map 3: Toll Roads in 2015



Map 4: Toll Roads in 2025



Map 5: Toll Roads in 2035



Lane Miles

For the environmental justice assessment analysis, two measures have been established to quantify the impacts of the regional toll network. The first measure, 'lanes miles' provides an indication of the proximity of the EJ zones to the regional network and proposed improvements to both tolled and non-tolled facilities. The second measure quantifies the accessibility EJ and non-EJ zones in terms of square miles that can be reached in 5-minute time intervals using the regional network and proposed improvements.

Lane miles are a unit of measurement for determining the extent of tolling in EJ and non-EJ areas. The analysis requires an enumeration of the non-tolled, tolled and managed lane-miles located inside, outside or adjacent to (in between) EJ and non-EJ areas. Lane miles adjacent to EJ zones form a border between EJ and non-EJ areas and so could be considered both in EJ and non-EJ areas simultaneously. It is more accurate to consider these lane miles as adjacent to EJ zones rather than add these lane miles to both the EJ and non-EJ zone lane miles.

Based on lane mile information, there are fewer tolled lane miles in the EJ area than in the non-EJ area, even if the "adjacent to" lane miles are added to the EJ lane miles. There are also fewer non-tolled lane miles in the EJ area than the non-EJ area. However, if the non-tolled "adjacent to" lane miles are added to the EJ non-tolled lane miles then there are more non-tolled lane miles in the EJ area than in the non-EJ area. Figure 2 shows the non-tolled highway, tolled highway and managed lane-miles in the CAMPO area in 2010 and 2035.

Figure 2: Tolled, Managed and Non-tolled Lane-miles in the CAMPO Area

Tolled Highways - 2010 Existing Lane Miles

Road	Segment	Inside EJ	Adjacent to EJ	Outside EJ	Total
SH 45 N	US 183 N - SH 130	0	10.48	81.72	92.20
SH 45 SE	IH 35 - SH 130	1.74	0	27.13	28.87
SH 130	IH 35 N - SH 45 SE	83.30	0	108.60	191.89
Loop 1	SH 45 N – Scofield Ridge Parkway	0	0	20.75	20.75
183A	West of FM 1431 - SH 45 N	0	0	25.07	25.07
	Total	85.03	10.48	263.26	358.78

Tolled Highways – Planned

Road	Segment	Inside EJ	Adjacent to EJ	Outside EJ	Total
SH 130	SH 21 - S Caldwell County Line	26.67	9.75	70.50	106.92
SH 71 W	Raccoon Run - US 290 W	0	0	6.44	6.44
US 290 W	W. of Scenic Brook to Joe Tanner Ln	0	0	16.13	16.13
US 290 E	US 183 – East of Parmer Lane	4.70	24.86	3.69	33.24
SH 45 SW	LP 1 – FM 1626	0	0	12.98	12.98
US 183 (N)	SH 29 -– 183A	0	1.33	13.59	14.92
US 183 (S)	US 290 E – Patton	43.39	0	0.31	43.71
183A	San Gabriel River – West of FM 1431	0	0	28.65	28.65
SH 71 E	Presidential Blvd – East of SH 130	0	11.59	0	11.59
	Total	74.76	40.84	152.29	267.89

Managed Lanes – Planned

Road	Segment	Inside EJ	Adjacent to EJ	Outside EJ	Total
US 183 N	Lakeline Blvd - LP 1	0	3.92	13.48	17.40
LP 1 N	Parmer Ln - Cesar Chavez	0	2.85	18.54	21.39
LP 1 S	Cesar Chavez - Slaughter Ln	0	2.71	13.25	15.96
Parmer Ln	SH 45 N - LP 1	0	0.0	10.26	10.26
	Total	0	9.49	55.52	65.01

Non-tolled Highways – 2010

Road	Segment	Inside EJ	Adjacent to EJ	Outside EJ	Total
IH 10	Caldwell County	0	0	25.85	25.85
IH 35	Northern Boundary - Southern Boundary	191.12	162.46	166.40	519.99
LP 1	Parmer Ln - Slaughter Ln	0	17.66	94.48	112.14
SH 71 E	IH 35 - W of Riverside Dr	15.91	0	0	15.91
SH 71	W of SH 304 - Colorado River	0	0	8.95	8.95
US 183	SH 45 N - Springdale Rd	24.74	18.24	41.94	84.92
US 290 W	Patton Ranch Rd - IH 35	17.91	9.60	16.63	44.14
US 290 E	Airport Blvd - US 183	14.45	0.25	0	14.70
	Total	264.12	208.22	354.26	826.60

Non-tolled Highways – 2035

Road	Segment	Inside EJ	Adjacent to EJ	Outside EJ	Total
IH 10	Caldwell County	0	0	25.85	25.85
IH 35	Northern Boundary - Southern Boundary	191.12	162.46	166.40	519.99
LP 1	Parmer Ln - Slaughter Ln	0	17.66	94.48	112.14
SH 71 E	IH 35 - Presidential Blvd	24.83	11.94	0	36.77
SH 71	FM 20 – Arena	0	2.25	21.91	24.16
US 183	SH 45 N - Springdale Rd	24.74	18.24	41.94	84.92
US 290 W	Joe Tanner Ln - IH 35	17.91	9.60	16.63	44.14
US 290 E	Airport Blvd - US 183	14.45	0.25	0	14.70
	Total	273.05	224.08	367.22	864.35

Travel Time

Travel time is another measure of transportation equity. The distance traveled in a set amount of time should be approximately the same for trips originating in EJ areas as it is for trips originating in non-EJ areas. If EJ areas have a disproportionate time or distance disadvantage compared to non-EJ areas, there may be transportation system inequities.

CAMPO analyzed travel times for 2005, 2010 and the 2035 Plan using output from the travel demand model. The 2005 model scenario was used because it is the travel demand model base year and it reflects the latest model scenario available in which there were no toll roads in operation. The 2010 model scenario was used because it represents existing conditions, including currently operating toll roads. The 2035 model scenario was used because it reflects the last year of the CAMPO plan, including all existing or planned toll roads or lanes. Travel time analyses for the interim 2015 and 2025 model scenarios were not conducted because analyses of the 2010 and 2035 scenarios did not indicate any disproportionate differences in travel times in counties that include the toll system, so it is highly unlikely that analyses of the interim years would do so. The analysis uses representative sample pairs of EJ and non-EJ zones in Bastrop, Caldwell, Hays, Travis and Williamson counties. EJ zone pairs selected were those with high populations. The selected non-EJ zones had comparable distance from major roads and similar population amounts as the EJ zones. Comparing five-minute travel time intervals (from 5 to 30 minutes) for both the EJ and non-EJ zones for each zone pair shows the area covered (in square miles) for each five minute travel interval. Square miles are used for the comparison in order to capture travel in any possible direction. Comparing the area covered by each of the time intervals for each zone pair reveals potential disproportionate differences between the two.

Because drivers often think of their trips in five minute intervals, the analysis uses the area covered by a five minute interval for the EJ zone and non-EJ zone pair to determine disproportionate differences. Disproportionate differences occur if the travel in any 5 minute interval for the EJ zone covers substantially less area than that of the non-EJ zone. In order to quantify this, CAMPO determined that one-half the area or less would signify a disproportionate difference. Therefore, if the area covered by the EJ zone five minute time intervals is one half, or less, of the area

covered by the non-EJ zone five minute intervals, then the EJ zone may have a disproportionate travel time disadvantage. This analysis was conducted for both the uncongested mid-day period and A.M. peak period where congested conditions exist.

Figures 3A and 3B summarize the results of the travel time analysis for the mid-day and A.M. peak period conditions respectively, which show the incremental increases of area covered by every five-minute interval. In general, the selected EJ and non-EJ zone pairs had similar travel times, indicating that EJ zones are not disproportionately disadvantaged in terms of travel time. Note that one zone pair in Bastrop County in the A.M. peak had a probable 2035 EJ travel time disadvantage for the 5-minute interval that met the disproportionate threshold. There are no toll roads or managed lanes in that county, so it is reasonable to assume that the toll roads or managed lanes did not cause or contribute to these disadvantages.

Updates were made to the model since the previous Regional Toll Analysis. The interim regional model now has four separate time-of-day assignments, and so both midday travel times which are encountered primarily by non-work trips and AM peak travel times which are encountered by work trips, can be analyzed in this RTA. Most regional models (including CAMPO's) use A.M. peak period congestion to control trip distribution and mode choice for work trips because this period reflects travel conditions encountered when traveling from the 'home' or origin end of typical commuter trip. As opposed to analyzing the A.M. and P.M. peaks periods, this analysis uses A.M. peak period trips and mid-day trips, which are available through the new time-of-day assignments, in order to determine the effects of all of the existing and proposed toll/managed lanes in the five county modeling area during different daily travel conditions.

Figure 3A: Travel Time Analysis Results (Mid-day Period)

Mid-day Period

	2005						2010						2035					
Bastrop	5	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20	25	30
EJ 1192	16.20	87.79	175.85	276.69	383.64	308.77	15.87	85.30	173.50	273.87	380.74	302.00	9.62	53.94	124.66	254.94	369.13	287.95
Non EJ 1371	16.94	73.42	157.75	276.90	348.81	295.26	16.73	74.60	158.71	277.35	347.60	294.89	10.27	49.98	125.01	248.06	360.00	281.96
EJ 1217	30.06	109.12	176.86	263.38	330.88	411.01	27.25	108.60	172.49	256.70	338.99	412.56	24.79	106.27	180.18	243.81	351.86	407.18
Non EJ 1223	30.52	108.11	174.90	265.85	327.76	418.23	28.96	107.71	172.15	259.44	338.31	430.31	23.46	103.73	167.91	253.84	343.08	427.69
Caldwell																		
EJ 1293	25.41	109.40	202.77	260.72	306.47	332.58	25.08	106.58	201.58	259.83	310.13	356.40	16.40	93.73	211.48	275.30	309.24	370.82
Non EJ 1298	27.02	111.68	205.71	258.35	313.94	310.26	26.50	109.15	203.75	257.33	316.63	334.04	15.87	89.20	210.59	269.38	312.83	347.86
Hays																		
EJ 590	18.99	70.09	153.27	224.09	311.11	401.54	18.94	67.04	155.44	220.93	303.26	425.25	20.36	67.49	141.79	229.82	301.54	428.65
Non EJ 829	18.90	84.02	164.58	249.69	336.04	366.05	20.73	85.40	163.72	252.39	342.09	367.26	17.34	65.12	151.76	254.73	315.27	337.29
EJ 921	16.87	97.21	141.37	171.26	216.15	263.28	16.57	92.01	139.36	167.57	219.79	266.94	13.68	89.61	137.69	145.27	207.09	244.80
Non EJ 739	14.36	86.76	159.59	174.36	221.64	267.33	13.84	81.64	156.46	170.07	225.40	268.72	21.43	89.09	150.81	157.64	221.40	260.65
Travis																		
EJ 302	17.88	68.71	153.50	241.42	343.96	456.39	16.84	71.83	170.25	262.56	388.72	487.19	11.67	57.18	137.58	232.22	337.62	457.62
Non EJ 226	18.86	85.40	167.28	246.81	344.98	446.43	20.17	91.56	169.35	273.64	377.37	474.26	19.63	72.95	142.54	232.92	310.47	442.16
EJ 457	12.95	76.77	176.43	279.37	388.03	494.92	12.25	71.47	171.02	273.37	373.77	495.14	9.17	50.03	134.80	235.77	315.26	441.49
Non EJ 477	14.66	77.86	184.25	285.97	398.08	503.05	12.50	68.32	173.43	270.42	377.64	495.33	9.91	51.54	136.04	237.59	319.18	450.60
Williamson																		
EJ 125	19.14	78.63	191.24	282.39	374.84	454.02	19.15	76.60	201.14	295.27	377.55	462.65	13.42	53.76	135.28	256.11	365.44	427.03
Non EJ 123	15.82	93.16	201.18	283.33	380.27	473.21	15.53	90.57	209.69	301.77	381.73	486.51	16.63	62.51	146.87	265.15	360.26	450.92
EJ 854	26.43	97.84	150.03	239.11	285.82	345.02	25.63	97.10	146.99	244.09	305.40	353.82	22.07	92.52	150.97	231.17	279.53	347.36
Non EJ 924	26.96	98.67	155.62	243.77	294.15	354.38	26.15	99.12	152.83	249.77	313.47	361.01	21.58	93.60	159.28	235.28	285.39	354.94

Note: Analysis uses 5 minute increments. Amount traveled in each 5 minute increment is measured in square miles.

Figure 3B: Travel Time Analysis Results (AM Peak Period)

AM Peak Period

	2005						2010						2035					
Bastrop	5	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20	25	30
EJ 1192	15.33	79.98	165.00	262.23	372.03	269.86	15.39	80.53	163.46	259.90	368.91	265.01	4.12	19.61	69.07	127.48	229.05	314.46
Non EJ 1371	16.72	69.60	147.00	262.74	336.24	268.64	16.50	71.89	149.43	263.33	335.42	266.62	8.64	35.15	92.50	163.46	287.01	231.67
EJ 1217	29.65	105.49	167.44	243.40	315.62	373.06	26.81	105.81	164.15	235.62	314.41	371.40	21.26	82.72	163.50	210.50	285.26	338.08
Non EJ 1223	30.12	103.80	162.97	245.43	313.22	382.10	28.47	104.00	161.54	236.24	315.67	384.13	21.09	83.34	153.53	218.50	294.26	350.23
Caldwell																		
EJ 1293	24.29	105.97	196.52	250.41	295.13	314.55	23.74	102.27	193.82	244.76	300.26	329.18	12.67	74.42	174.87	266.47	283.68	336.51
Non EJ 1298	26.10	107.57	200.50	251.55	300.42	292.97	25.39	104.02	197.55	247.70	297.24	313.01	11.41	69.04	165.06	242.10	289.45	295.87
Hays																		
EJ 590	18.73	68.54	147.78	212.26	290.48	384.14	18.72	65.69	147.37	210.34	280.67	406.30	20.11	60.23	118.84	212.38	263.26	414.24
Non EJ 829	15.46	73.44	144.60	229.74	309.87	358.28	19.21	76.75	144.83	223.61	315.68	360.79	15.52	52.14	125.88	201.55	277.95	327.74
EJ 921	15.37	91.46	141.64	164.83	208.68	249.66	15.90	87.64	137.38	160.99	210.55	254.14	11.35	82.53	138.01	133.72	190.84	214.27
Non EJ 739	13.59	81.11	160.24	168.82	213.85	251.16	13.33	77.38	155.07	163.19	216.38	255.47	20.51	84.00	147.28	142.51	201.73	226.29
Travis																		
EJ 302	16.84	65.38	146.02	234.89	325.25	448.25	16.05	67.95	164.13	258.16	376.66	480.20	9.67	42.82	112.47	218.49	304.38	419.97
Non EJ 226	18.37	80.15	158.17	233.37	326.45	435.38	18.94	85.06	160.84	263.24	357.69	468.71	15.66	63.18	130.46	217.80	300.16	427.56
EJ 457	11.50	68.64	164.65	265.72	372.31	481.13	10.53	63.85	158.06	257.98	352.55	477.16	6.63	39.98	115.90	207.44	290.78	395.28
Non EJ 477	13.89	71.30	171.07	273.75	382.47	489.58	11.35	61.94	156.63	253.84	362.06	471.93	8.37	43.14	118.30	205.04	306.11	399.39
Williamson																		
EJ 125	18.59	69.61	174.86	265.82	359.46	429.94	18.50	65.93	186.47	280.86	364.74	444.76	10.30	44.30	95.92	211.26	319.26	396.92
Non EJ 123	14.14	80.71	181.55	268.60	358.63	437.53	13.75	75.58	192.55	285.80	365.15	459.23	14.05	45.13	107.51	218.86	326.17	411.41
EJ 854	25.58	93.97	134.49	216.33	246.99	307.74	24.47	92.44	139.13	227.63	283.24	332.94	20.47	85.35	137.80	214.28	238.39	321.41
Non EJ 924	26.08	94.61	139.06	219.18	256.29	318.44	25.11	95.17	144.99	236.24	295.48	339.37	19.22	86.91	147.63	217.78	247.66	321.31

Note: Analysis uses 5 minute increments. Amount traveled in each 5 minute increment is measured in square miles.

Methods of Toll Collection

TxDOT and the Central Texas Regional Mobility Authority (CTRMA) construct and operate the toll roads and managed lanes in the CAMPO area. Additionally, the private SH 130 Concession Company LLC, constructed and operates the southernmost portion of SH 130 (Segments 5 and 6) in partnership with TxDOT. CTRMA, TxDOT, and the SH 130 Concession Company work cooperatively to establish an integrated toll network with interoperable toll collection methods. TxTag is one of several electronic toll collection (ETC) methods that function on all CAMPO-area toll roads, along with the Dallas-area TollTag and Houston-area EZ TAG, it is also accepted on Texas Tollways operated statewide. Drivers establish a TxTag account, pre-pay a specified amount, and receive a TxTag sticker. According to the website www.txtag.org, "The TxTag sticker is a thin device that goes on the inside of your windshield behind your rearview mirror. It is slightly smaller than your vehicle registration or inspection sticker. TxTag uses an electronic chip and your windshield's glass to send its signal to the electronic equipment above toll lanes." The TxTag signal electronically debits the user's account for the toll cost. TxTags enable drivers to travel toll roads without having to slow down to pay tolls. TxTags are available (online, by phone, by mail or in-person) at the TxTag Customer Service Center in Austin and through American Automobile Association (AAA) District offices in Texas. Below is an image of the TxTag.

Figure 4: Image of TxTag

Drivers without an ETC transponder can use the toll roads using a pay-by-mail (PBM) process that uses video recognition of license plates to charge tolls to vehicle owners. Note that all CAMPO-area toll roads do not accept cash. Future toll roads in the region will accept only ETC or PBM payment options and other All-Electronic Tolling (AET) options that may be provided in the future.

With PBM, video cameras photograph vehicle license plates as they pass through the toll plazas. License plate information identifies the vehicle owner, who receives a monthly bill. The toll rate for paying by mail is 33% higher than the rate for paying by TxTag. In addition, paying by mail incurs a $1.15 monthly administrative fee.

Toll rates vary by road and vehicle type. Typically, the more axles the vehicle has, the higher the toll. This is because the heavier, multi-axle vehicles damage the pavement more than lighter passenger vehicles.

Toll rates can also vary by time of day or traffic condition. This type of variance is generally referred to as variable or dynamic pricing and is used to manage traffic flow on the tolled lanes. While none of the existing toll roads use variable pricing, it may be used for the planned managed lanes. The current CAMPO travel demand model includes a time of day model, and so can be used to evaluate the effects of variable pricing on EJ areas.

Figure 5A shows the current 2013 toll road system in Central Texas, while 5B show the corresponding toll rates and collection methods (original information sourced from website www.texastollways.com, modified to reflect current condition).

Figure 5A: Existing Toll Roads in 2013

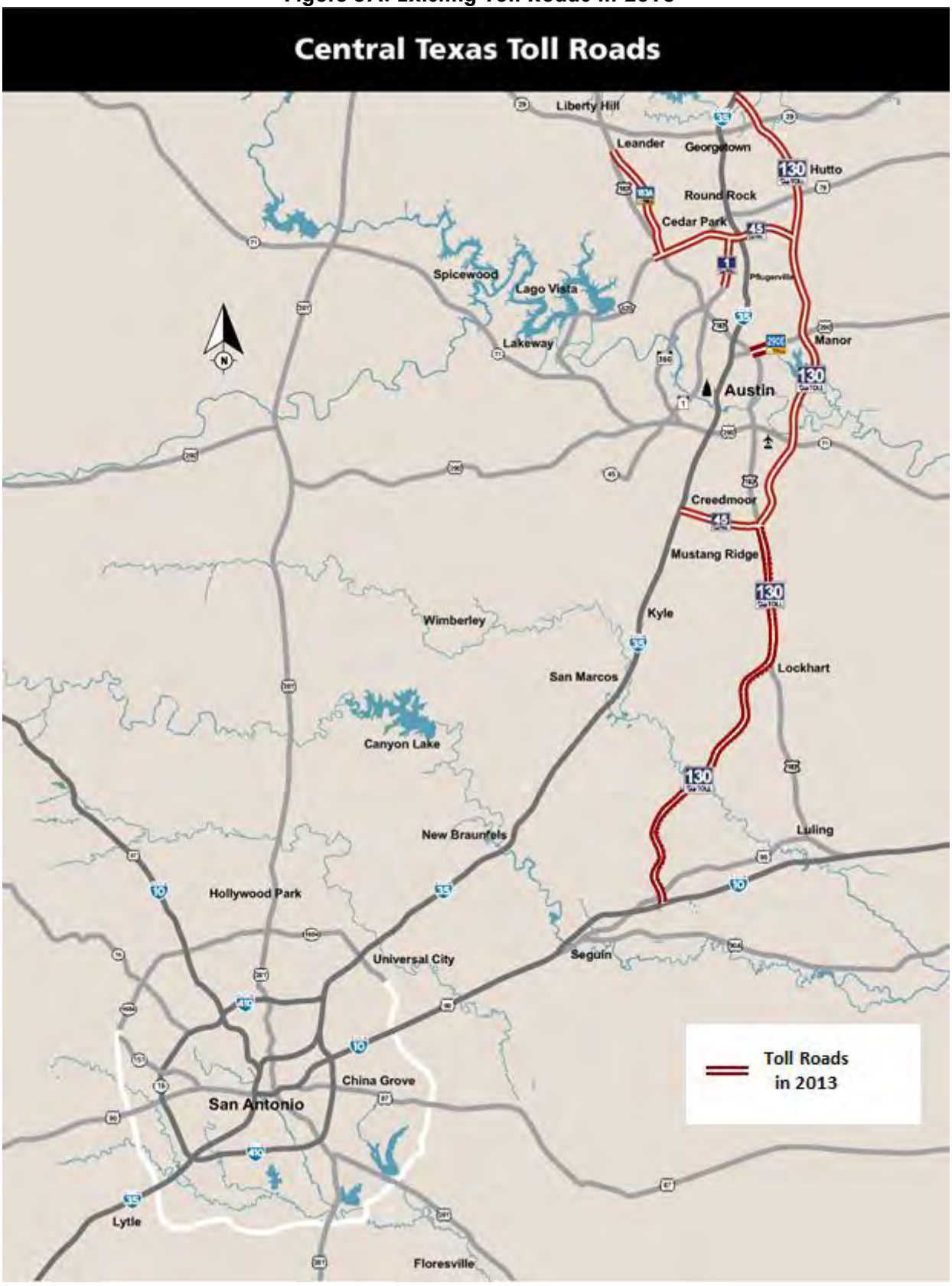


Figure 5B: Existing (2013) Toll Rates and Collection Methods

CENTRAL TEXAS TOLL RATES (as of Jan 1, 2013)		2-axle vehicles		Unibody truck, bus, motorhome*		3-axle vehicles		4-axle vehicles		5-axle vehicles		6-axle vehicles	
		Tag	Pay By Mail	Tag	Pay By Mail	Tag	Pay By Mail	Tag	Pay By Mail	Tag	Pay By Mail	Tag	Pay By Mail
1	Plaza	$1.02	$1.36	$1.02	$1.36	$2.04	$2.72	$3.06	$4.08	$4.08	$5.44	$5.10	$6.80
	Ramps	$0.68	$0.90	$0.68	$0.90	$1.36	$1.80	$2.04	$2.70	$2.72	$3.60	$3.40	$4.50
45 NORTH	Plazas	$1.02	$1.36	$1.02	$1.36	$2.04	$2.72	$3.06	$4.08	$4.08	$5.44	$5.10	$6.80
	Parmer Ln & RM 620 Ramps	$0.88	$1.17	$0.88	$1.17	$1.76	$2.34	$2.64	$3.51	$3.52	$4.68	$4.40	$5.85
	O'Connor Dr Ramps	$0.90	$1.20	$0.90	$1.20	$1.80	$2.40	$2.70	$3.60	$3.60	$4.80	$4.50	$6.00
	Greenlawn & AW Grimes Ramps	$0.68	$0.90	$0.68	$0.90	$1.36	$1.80	$2.04	$2.70	$2.72	$3.60	$3.40	$4.50
	Schultz Ln & Wilke Ln Ramps	$1.02	$1.36	$1.02	$1.36	$2.04	$2.72	$3.06	$4.08	$4.08	$5.44	$5.10	$6.80
45 SOUTHEAST	Plaza	$1.00	$1.33	$3.00	$3.99	$2.00	$2.66	$3.00	$3.99	$3.00	$3.99	$3.00	$3.99
	Ramps	$0.66	$0.88	$1.98	$2.64	$1.32	$1.76	$1.98	$2.64	$1.98	$2.64	$1.98	$2.64
130 SEGMENTS 1-4	Plazas	$1.69	$2.25	$1.69	$2.25	$3.38	$4.50	$5.07	$6.75	$5.07	$6.75	$5.07	$6.75
	SH 29, Blue Bluff, Harold Green & Moore Rd Ramps	$0.45	$0.60	$0.45	$0.60	$0.90	$1.20	$1.35	$1.80	$1.35	$1.80	$1.35	$1.80
	FM 104, Pecan St, Gregg Manor, FM 973, FM 969, Pearce Ln & FM 812 Ramps	$0.56	$0.74	$0.56	$0.74	$1.12	$1.48	$1.68	$2.22	$1.68	$2.22	$1.68	$2.22
	US 79, CR 138, Chandler Rd & Elroy Rd Ramps	$0.73	$0.97	$0.73	$0.97	$1.46	$1.94	$2.19	$2.91	$2.19	$2.91	$2.19	$2.91
	Cameron Rd Ramps	$1.69	$2.25	$5.07	$6.75	$3.38	$4.50	$5.07	$6.75	$5.07	$6.75	$5.07	$6.75
130 SEGMENTS 5-6	SH 21 Ramps	$0.73	$0.97	$2.18	$2.90	$1.46	$1.94	$2.91	$3.87	$2.91	$3.87	$3.64	$4.84
	Skyline Plaza	$1.94	$2.58	$5.79	$7.59	$3.87	$5.15	$7.72	$9.52	$7.72	$9.52	$9.65	$11.45
	FM 1185 Ramps	$0.41	$0.55	$1.20	$1.60	$0.80	$1.06	$1.60	$2.13	$1.60	$2.13	$2.00	$2.66
	SH 142 Ramps	$0.63	$0.84	$1.86	$2.47	$1.25	$1.66	$2.48	$3.30	$2.48	$3.30	$3.11	$4.14
	Bluebonnet Plaza	$4.23	$5.63	$12.64	$14.44	$8.45	$10.25	$16.86	$18.66	$16.86	$18.66	$21.08	$22.88
	SH 80 Ramps	$2.44	$3.25	$7.28	$9.08	$4.87	$6.48	$9.72	$11.52	$9.72	$11.52	$12.15	$13.95
	FM 621 Ramps	$2.03	$2.70	$6.06	$7.86	$4.05	$5.39	$8.08	$9.88	$8.08	$9.88	$10.11	$11.91
	FM 20 Ramps	$1.04	$1.38	$3.11	$4.14	$2.08	$2.77	$4.15	$5.52	$4.15	$5.52	$5.18	$6.89
183A	Lakeline Plaza	$0.51	$0.68	$0.51	$0.68	$1.02	$1.36	$1.53	$2.04	$2.04	$2.72	$2.55	$3.40
	Park Street Plaza	$1.38	$1.84	$1.38	$1.84	$2.76	$3.68	$4.14	$5.52	$5.52	$7.36	$6.90	$9.20
	Brushy Creek & Scottsdale Ramps	$0.55	$0.73	$0.55	$0.73	$1.10	$1.46	$1.65	$2.19	$2.20	$2.92	$2.75	$3.65
	Crystal Falls Plaza	$0.97	$1.29	$0.97	$1.29	$1.94	$2.58	$2.91	$3.87	$3.88	$5.16	$4.85	$6.45
	Crystal Falls Ramps	$0.37	$0.49	$0.37	$0.49	$0.74	$0.98	$1.11	$1.47	$1.48	$1.96	$1.85	$2.45
290E MANOR EXPRESSWAY	US 183 Ramps	$0.50	$0.67	$0.50	$0.67	$1.00	$1.34	$1.50	$2.01	$2.00	$2.68	$2.50	$3.35
	Springdale Road Ramps	$0.50	$0.67	$0.50	$0.67	$1.00	$1.34	$1.50	$2.01	$2.00	$2.68	$2.50	$3.35

*Rates for unibody truck, bus, or motorhome on Loop 1, 45 North, 183A and 130 Segments 1-4 are based on the number of axles.

Promotional rates apply only to SH 130 and SH 45 Southeast for a period of up to one year, effective April 1, 2013. During the promotional period, the 2-axle rate (effective January 1, 2013, as escalated or amended) will be charged to all vehicles, regardless of classification. The purpose of the promotion is to reduce traffic congestion on I-35 and to make Central Texas roadways safer by encouraging greater through trips of trucks on Central Texas toll roads. The Commission has allocated $5 million to be used to make up the difference in revenue between the temporary toll rates charged to vehicles with more than 2 axles and the standard toll rates. Once the funds are depleted, the discount program will end.

Toll Policies

CAMPO Toll Policies

The CAMPO Board has adopted several policies and resolutions related to tolling. These policies affect project funding, design, operation, and revenue while striving to avoid or minimize inequities. Adopted CAMPO toll policies are:

- 2035 Plan Policy 14. Any existing roadway to which additional tolled capacity is added should continue to be maintained and improved and to provide the same amount

or more non-tolled capacity as the roadway currently provides. To the extent that it is within the authority of the toll operator and the CAMPO Transportation Policy Board, the non-tolled capacity shall have the same number or fewer traffic control devices as the current roadway except where law and/or safety requires otherwise.

- 2035 Plan Policy 15. The initial operation of any tolled facility shown on Map 1 of the Appendices (NOTE: Map 1 of the 2035 Plan Appendices shows US 290E, US 183S, US 290W, SH 71W, and SH 45SW with limits as indicated in Figure 2) shall include rapid bus traffic. At such time that congestion on the tolled facility warrants dedication of a lane to rapid bus and high occupancy vehicles to ensure their swiftest passage, an existing lane will be dedicated and any excess capacity within the dedicated lane shall be available to other vehicles at a tolled rate.

- 2035 Plan Policy 16. At the discretion of the Central Texas Regional Mobility Authority (CTRMA), some or all of the following tolled facilities, and projects within the transportation corridor (as defined below) of these tolled facilities, may be combined into one or more systems for financing purposes:

  - 183A;
  - US 290(E) from US 183(S) to Parmer Lane;
  - US 183(S) from US 290(E) to SH 71(E);
  - SH 71(W) from Silvermine to US 290(W);
  - US 290(W) from west of Scenic Brook to east of Williamson Creek; and
  - Loop 1 Managed Lanes from Parmer Lane (FM 734) to Slaughter Lane (The system eligible projects)

  For non-system Eligible Projects, surplus revenue (as defined in Section 370.003(12), Texas Transportation Code), to the extent permitted by law, may be made available for use in the transportation corridor by the CTRMA for the following purposes:

  1. Improvement of the alternative non-tolled capacity including improvement of arterials impacting or impacted by the tolled facility;
  2. Further implementation of non-tolled access to tolled lanes by high occupancy vehicles beyond that made available in initial operations and any other transportation projects designed to reduce per capita vehicle miles traveled within the corridor;
  3. Further mitigation of environmental or community degradation as a result of the tolled facility that was not previously addressed under state or federal requirements; and
  4. Other public transportation or air quality benefits within the corridor.

  For purposes of this policy, the phrase "transportation corridor" is defined as that area within 1 mile of the midline of the tolled facility and those zip codes from which 10% or more of the peak A.M. toll tag transactions on that facility originate.

  In the event the CTRMA determines that a non-System Eligible Project lacks adequate sources of funding, the CTRMA may request, and CAMPO may approve, adding the project to an existing system upon completion of the following:

1. The CAMPO Transportation Policy Board, with the input of the CTRMA, has approved the Statement of Purpose describing the transportation project and need;
2. CAMPO, in conjunction with the CTRMA, has convened two region-wide community meetings to elicit input regarding the Statement of Purpose; and
3. After the community meetings described above have been held and one public hearing before the CAMPO Transportation Policy Board has been completed, the addition of the project to an existing system is approved by a majority of the CAMPO Transportation Policy Board.

- 2035 Plan Policy 17. The CTRMA should engage in public outreach efforts to encourage DBE and HUB participation in CTRMA developed projects, and the CTRMA should report to CAMPO about those efforts on an annual basis. The CTRMA should (1) establish a process for outreach to minority-owned, women-owned and economically disadvantaged businesses to achieve appropriate levels of DBE and HUB participation in projects which are part of the Regional Implementation Program and (2) subject to Federal and State law, set specific goals and adopt policies for HUB participation consistent with1 TEX ADMIN. CODE Section 11 1.13 in any DBE/HUB policy finally adopted for the Regional Implementation Program.

- 2035 Plan Policy 18. State Highway 45 Southwest.
  SH 45 SW shall be developed as a toll parkway/freeway 4-lane road;

  - TxDOT and the CTRMA shall implement where feasible, and if approved by federal authorities under existing restrictions governing the State Highway 45 Southwest corridor, the development of a non-tolled alternative within the corridor in the form of free parallel frontage roads;
  - If the US Fish and Wildlife Service and other federal entities found the expansion to not be feasible under environmental concerns, then SH 45 would not be tolled; and,
  - In the event non-tolled frontage roads cannot be developed within the corridor, it is the intent of CAMPO that TxDOT and the CTRMA consider toll rates and policies that promote the use of State Highway 45 Southwest and disincentives for the use of Brodie Lane by thru-traffic and trucks.

TxDOT and CTRMA Toll Policies

TxDOT's toll policy for the Austin region was developed initially in conjunction with the planning for the Central Texas Turnpike System (CTTS). Initial phases of the CTTS were implemented in 2006 and consisted of an eastern bypass of Austin (SH 130), the Loop 1 Toll Road, and SH 45 North. Although each of the roadways served different travel markets the toll rates per mile were similar, as was the toll policies related to truck tolls. When the facilities first opened, toll charges could be paid with either cash and via TxTag transponders. As the system matured, the cash option was eventually discontinued and the pay-by-mail (PBM) tolling option was implemented, consistent with CTRMA's tolling policy. Both TxDOT and CTRMA apply a 33% surcharge to the base toll rates for those patrons using the PBM option. TxDOT also adjusted the toll rates for each facility to better address the demand for each roadway and to achieve certain safety-related policy objectives, such as diverting long-haul truck traffic from IH-35 to SH 130.

Currently, neither CTRMA nor TxDOT has any operational managed lane projects in the Austin region. However, CTRMA's MOPAC managed lane facility is now under construction. The toll policy for this facility is based on dynamic pricing in order to ensure that the facility does not

become congested during peak periods. All vehicles will pay tolls and tolls will be assessed with either TxTag transponders or via PBM. However CAP Metro transit buses and registered nine-person van pools will not be charged tolls.

As part of each agency's toll policy, tolls for CTRMA's toll facilities and TxDOT's CTTS facilities are escalated annually based on inflation trends. Both agencies utilize a formula that uses the 12-month change in the consumer price index – urban (CPI-U) as published by the Bureau of Labor Statistics. The toll increases are implemented on January 1st of each year.

According to the TxTag website, travelers can use TxTag can be used to pay tolls on toll roads statewide, including CTRMA toll roads and toll lanes.

According to the TxDOT Toll Operations website, TxDOT has a toll exemption policy applicable to all state toll roads for:

- Authorized emergency vehicles as defined in Texas Transportation Code, Part A, Section 541.201 (fire department and police vehicles, public or private ambulances, municipal department of public service corporation emergency vehicles, private vehicles of volunteer firefighters or certified emergency medical services employees or volunteers when responding to a fire alarm or medical emergency, industrial emergency response vehicles when responding to an emergency, and vehicles of blood or tissue banks when making deliveries of blood, drugs, medicines, or organs);
- Marked, recognizable military vehicles, except on the Central Texas Turnpike System, where such vehicles may only receive free passage during time of war or other emergency;
- Department contractors working on the construction, improvement, maintenance, or operation of the toll project or system being traveled; and
- Any vehicle in the time of a declared emergency or natural disaster, as determined by the executive director of the department

The 83rd Texas Legislature passed Senate Bill 1792 relating to toll collection of for all toll roads in the state, regardless of the toll road owner/operator. The bill became law on June 14, 2013. This law created enforcement remedies targeted at "habitual violators" those who have accumulated 100 or more unpaid tolls in a year or less and have been issued two notices of nonpayment. Remedies include:

- Public listing of the habitual violators
- A vehicle registration block
- An order prohibiting operation of a vehicle owned by a habitual toll violator on toll highways, violation of which is a Class C misdemeanor
- Vehicle impoundment upon proof of repeated violation of the prohibition order

Habitual violators were notified of their habitual violator status and given an opportunity to challenge that determination through an administrative hearing process with a Justice of the Peace. An additional notice of the final determination that they are a habitual violator is required before remedies can be invoked. A 90 day grace period to pay outstanding tolls at a discount was available, after which the tolls due returned to full price. The law does allow the tolling entities to

enter into toll violation payment plan agreements with the registered owner of a vehicle allowing the person to pay the total amount of outstanding tolls and fees.

CTRMA toll collection policies include:

- A toll waiver for public transit vehicles and registered car/van pools (as defined by the latest CAMPO and/or CTRMA policy)
- A violations policy that allows several opportunities to pay delinquent tolls prior to advancing unpaid tolls to a collection agency and municipal courts, where fees and fines of up to $250 can be assessed. Similar to TxDOT's toll collection policies, CTRMA can waive certain fees in particular situations, such as cases where patrons may have not received bills in a timely manner.
- Pre-payment options using cash, credit, and debit cards and the ability to set up a TxTag account over the internet, by phone, or at the customer service center.

The tolling policies provide mitigating effects by minimizing potential negative impacts and by providing benefit to the EJ community. The CTRMA policy of waiving transit tolls benefits transit that uses CTRMA facilities, which in turn benefits the EJ community. Both Capital Metro and the Capital Area Rural Transportation System (CARTS) use the existing CTRMA toll road, 183A, and plan to use US 290(E), SH 71(E), US 183, and US 290(W). According to the TTI Toll Road Opinion Survey, the EJ population is more likely than the non-EJ population to use transit. Waiving the toll for transit could result in a faster, more reliable trip at no additional cost for the EJ transit user.

Policies governing the use of toll revenues promote equitable & regional benefits. Limiting use of additional toll revenues to the corridor in which they were accrued can benefit the EJ community living in or adjacent to toll corridors by funding other transportation, environmental and community projects. And, through an interlocal agency agreement between CAMPO and the CTRMA, revenue from the MoPac Managed Lanes project from Parmer Lane to Cesar Chavez can be spent on future non-tolled transportation infrastructure. Other potential benefits include jobs created by the toll projects and opportunities for EJ community businesses. Context sensitive solutions (CSS) techniques provide additional benefit by encouraging community participation in developing the project design concept and considering community needs and concerns in project implementation. The CTRMA uses CSS when developing design concepts. The CTRMA also initiated a Green Initiative to incorporate sustainability aspects into its projects and established a Green Credits Program for its future projects, similar to a LEEDS certification for buildings.

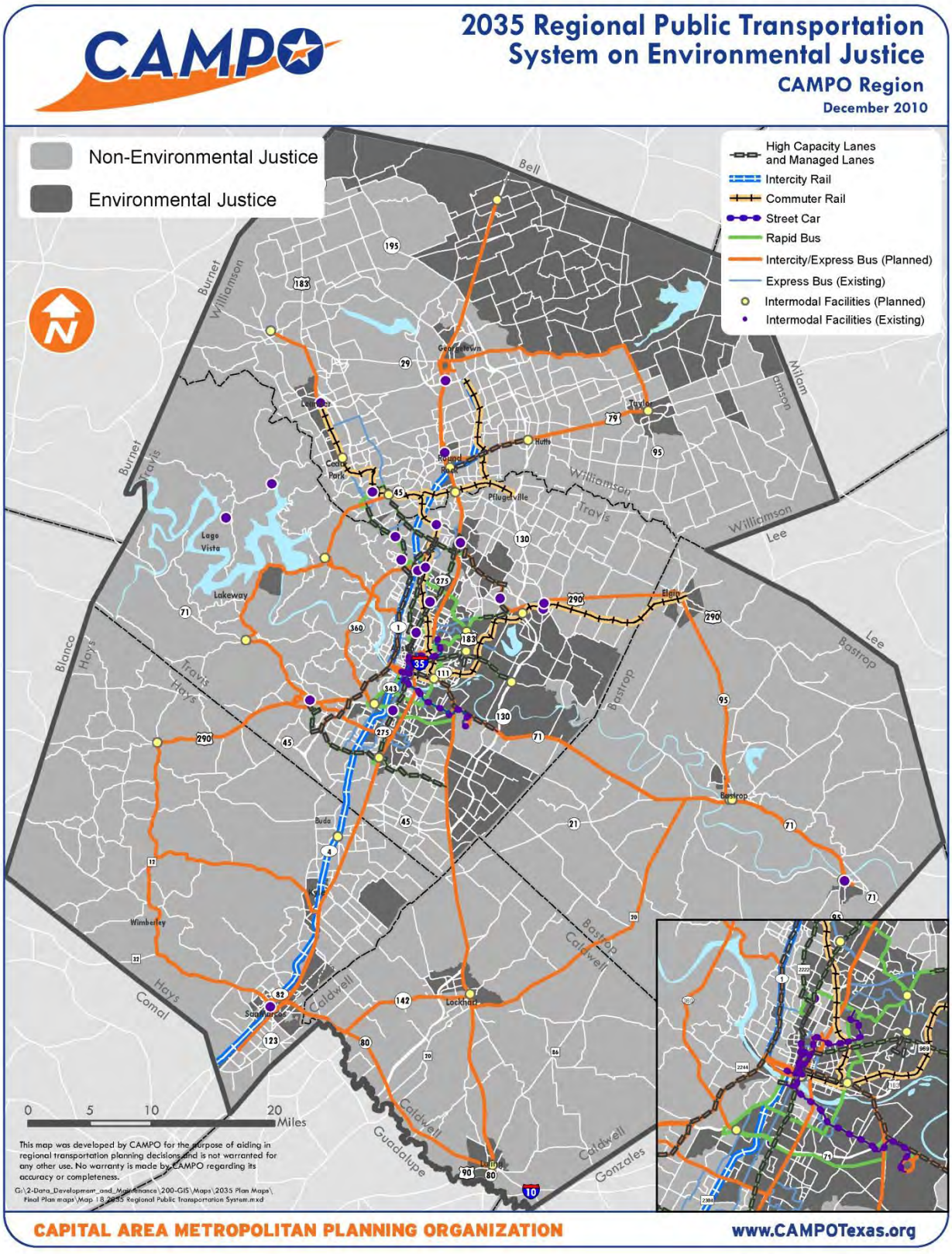
Providing the same, or more, non-toll capacity as currently exists minimizes negative impacts by ensuring a non-toll alternative route is maintained or improved. This gives the EJ population and all travelers a viable alternative if they choose not to pay the tolls. Maintaining a non-toll alternative also will minimize traffic diversion to adjacent neighborhoods.

CAMPO policy supports minimizing negative impacts by considering EJ populations, especially low-income travelers, when setting toll rates and collection methods. TxDOT and CTRMA provide multiple options for rate discounts and for payment methods (TxTag, video-tolling), making it easier for those who do not have a credit card to use the toll roads. For example, a traveler does not need a credit card to purchase and maintain a TxTag. Also, allowing sufficient time to pay a toll bill before accruing additional costs can benefit those without means for prompt payment.

Transit Use

Implementation of the 2035 Plan should improve transit service for all travelers, including the EJ community. The Plan's extensive transit component, coupled with roadway improvements that can enhance transit's travel times and reliability, result in better transit opportunities for much of the region's population. Waiving transit tolls allows transit to use the toll roads and managed lanes at no additional cost, improving travel times and reliability. Preserving existing non-toll capacity will facilitate movement on the road network, minimizing deterioration of transit travel times for local routes that don't use the toll roads. Details on the transit component of the 2035 Plan are located in Appendix A. Map 6 shows the relationship between the EJ areas and the 2035regional public transportation system.

Map 6: 2035 Regional Public Transportation System for Environmental Justice Analysis



Limited English Proficiency (LEP)
Limited English proficiency (LEP) can be a barrier to effective EJ community involvement and can hinder access to the tolled facilities. Spanish is the second most common language in the CAMPO area. CAMPO, TxDOT, and CTRMA all solicit input and provide information in Spanish, generally summary information on websites or in public notices. CTRMA and TxDOT work together to administer Spanish language services for phone based TxTAG customer service as well as a bilingual website. CAMPO conducts EJ and other surveys in Spanish and English to facilitate public input. Interpreters are often available at public meetings. The TxDOT Customer Service Center has Spanish speaking representatives to assist customers, making it easier for Spanish speakers to use the regional toll network. CAMPO's LEP Plan outlines the process for ensuring that LEP individuals have opportunities to learn about and be involved in regional transportation planning and projects that may affect them.

Cumulative Economic Impact to Individuals
The economic impact of choosing to travel on toll roads or lanes may have a greater impact to low-income individuals because the toll cost is a greater proportion of their income than that of median or higher income users. A quantitative analysis provides:

- An estimate of average annual travel on the toll network;
- The cost of the associated tolls; and,
- The percent of annual income used to pay the average annual tolls for poverty level, low income, and median income users.

The analysis examines expected conditions in 2010 and 2035. Data sources include the travel demand model, the US Census, the Consumer Price Index and various traffic and revenue studies.

The first step in conducting the analysis is to estimate average annual travel on the toll network for 2010 and 2035. The travel demand model estimates average vehicle miles traveled (VMT) on a weekday for the region. The daily toll network VMT is a subset of the daily regional VMT. In order to adjust the average weekday toll network VMT to average annual weekday toll network VMT (AAWDT VMT), the daily VMT is multiplied by 260, reflecting the number of days in a year excluding weekends. Weekend travel patterns and traffic volumes are different from those experienced on weekdays because trip making is largely discretionary. Traffic volumes are typically lower than on weekdays. These factors may influence route choice, making it less likely that the traveler will select a route on a toll road for weekend travel. The CAMPO travel demand model is a weekday model, so no quantifiable information is available for weekend VMT.

Calculation of the AAWDT VMT per capita uses population from the 2010 census data and CAMPO's 2035 population forecast and the estimated AAWDT VMT estimates. Multiplying the AAWDT VMT per capita by three generates total tolled VMT traversed by a typical family, consistent with the family size used in this analysis. The result reflects the annual weekday toll miles driven by a typical family in the region.

The next step identifies income levels for a typical family in the Austin region. The income levels for a typical family are based on the 2008-2010 American Community Survey 3-Year Estimates and use the median family income for a family size of three in the Austin - Round Rock – San Marcos Metropolitan Statistical Area. The forecast of annual income for 2035 uses a 25-year trend line (1985 to 2010) of the annual 'All Urban' Consumer Price Index (CPI) to calculate the

average annual percent change in the CPI. Income levels were inflated to 2035 based on an assumed 2.866% compounded inflation rate.

The next step calculates the existing toll rates for 2010 and toll rates for the year 2035. Note that in 2012, TxDOT adopted a policy of escalating tolls annually. For purposes of this analysis, a rate of 3.0% compounded annually was utilized, consistent with CTRMA's escalation assumptions for financial planning. For this analysis the 2010 toll rates were initially adjusted for the recent toll increases that were implemented on January 1, 2013 and then increased with a 3.0% escalation rate thereafter.

Finally, the analysis calculates the average annual toll cost for 2010 and 2035 by multiplying the average toll rates by the average annual weekday toll miles driven. The toll to income ratio calculation then determines the proportion of income spent on tolls for each income level (federal poverty level, 80% median family income and 100% median family income). The 2010 poverty threshold for families of three, $17,373, from Bureau of the Census is usedto analyze toll impacts. The results appear below.

Figure 6: Toll/Income Ratio by Income Level and Year for the Austin – Round Rock – San Marcos Metropolitan Statistical Area

	2010	2035
100% Median Family Income (MFI)	0.02%	0.08%
80% Median Family Income (MFI)	0.02%	0.10%
Poverty Level (Federal)	0.08%	0.33%

Existing 2010

Income Level (Family of 3)	Income ($/year)	Average Toll Rate ($/mile)	Annual Toll Miles Driven (per capita miles per year*3)	Annual Toll Cost ($/year)	Ratio (Toll/Income)
Federal Poverty	$ 17,373	0.14	102	$ 13.77	0.000792612
80%MFI	$ 57,365	0.14	102	$ 13.77	0.000240044
100%MFI	$ 71,706	0.14	102	$ 13.77	0.000192035

2035

Income Level (Family of 3)	Income ($/year)	Average Toll Rate ($/mile)	Annual Toll Miles Driven (per capita miles per year*3)	Annual Toll Cost ($/year)	Ratio (Toll/Income)
Federal Poverty	$ 35,207	0.33	355	$ 117.62	0.003340854
80%MFI	$ 116,252	0.33	355	$ 117.62	0.001011782
100%MFI	$ 145,315	0.33	355	$ 117.62	0.000809425

It should be noted that although the expected annual toll cost is relatively low for all users, the proportion of income used for tolls is higher for the low-income EJ population. A comparison of the federal poverty toll cost proportion to the 100% MFI toll cost proportion indicates that those in the federal poverty level category would pay roughly 4 times more of their income for tolls than those in the 100% median family income category, if they choose to use a toll road.

Existing and potential strategies to minimize possible negative effects of tolling on the low-income EJ population include: waiving transit tolls on CTRMA facilities to increase transit reliability and decrease travel times at no additional cost to the transit user, providing the same or more non-toll capacity in the corridor as currently exists to ensure viable non-toll alternatives, and limiting use of surplus toll revenue to the same corridor as the tolled facility to further improve those corridors and provide benefit to the corridor residents.

Identification of Potential Users

Determining the impact of the regional toll network on the EJ population requires measuring the extent to which the EJ population will use the toll roads and managed lanes. The 2008 Toll Road Opinion Survey addresses this question. The survey indicates that the EJ population uses the existing regional toll network to the similar extent as other travelers, with 56.2% of the core (EJ) population not using the toll network and 58.5% of other travelers not using the toll network. The survey also indicates that if a toll road were built between their home and work, the majority of both core (EJ) and all respondents would use the non-toll frontage road or another route. Only 9.7% of core (EJ) respondents and 11.7% of all respondents indicated they would use the toll road.

Another estimate of EJ population use of the planned toll network comes from the travel demand model's select link analysis method, described below.

- Identify network segments (links) representing any tolled roadways.
- Run the CAMPO highway assignment process storing trips that use the 'selected links'.
- Create a file of trips that contains the origin zone and destination zone of all trips that use any of the selected toll road links.
- Aggregate daily auto trip ends by origin for individual EJ and non-EJ TAZs for trips that use toll roads
- Map the resulting trips using GIS.

Three travel demand model scenarios: 2010 existing, 2035 Plan build out, and a 2035 no-build (2035 demographics on the 2010 network) underwent select link analysis. Results indicate that proximity to the toll roads and managed lanes is a determinant in toll road use for both the EJ and the non-EJ population. Traffic analysis zones closest to the toll roads generate more toll trips than those farther away. Over time, as the toll network, the region's population and the amount of roadway congestion grows, trips on the toll roads and managed lanes increase. In 2010, auto-based EJ TAZ toll trips were 15.0% of the total auto-based toll trips. In 2035, assuming implementation of the 2035 Plan, EJ toll trips are expected to be 18.33% of the total toll trips.

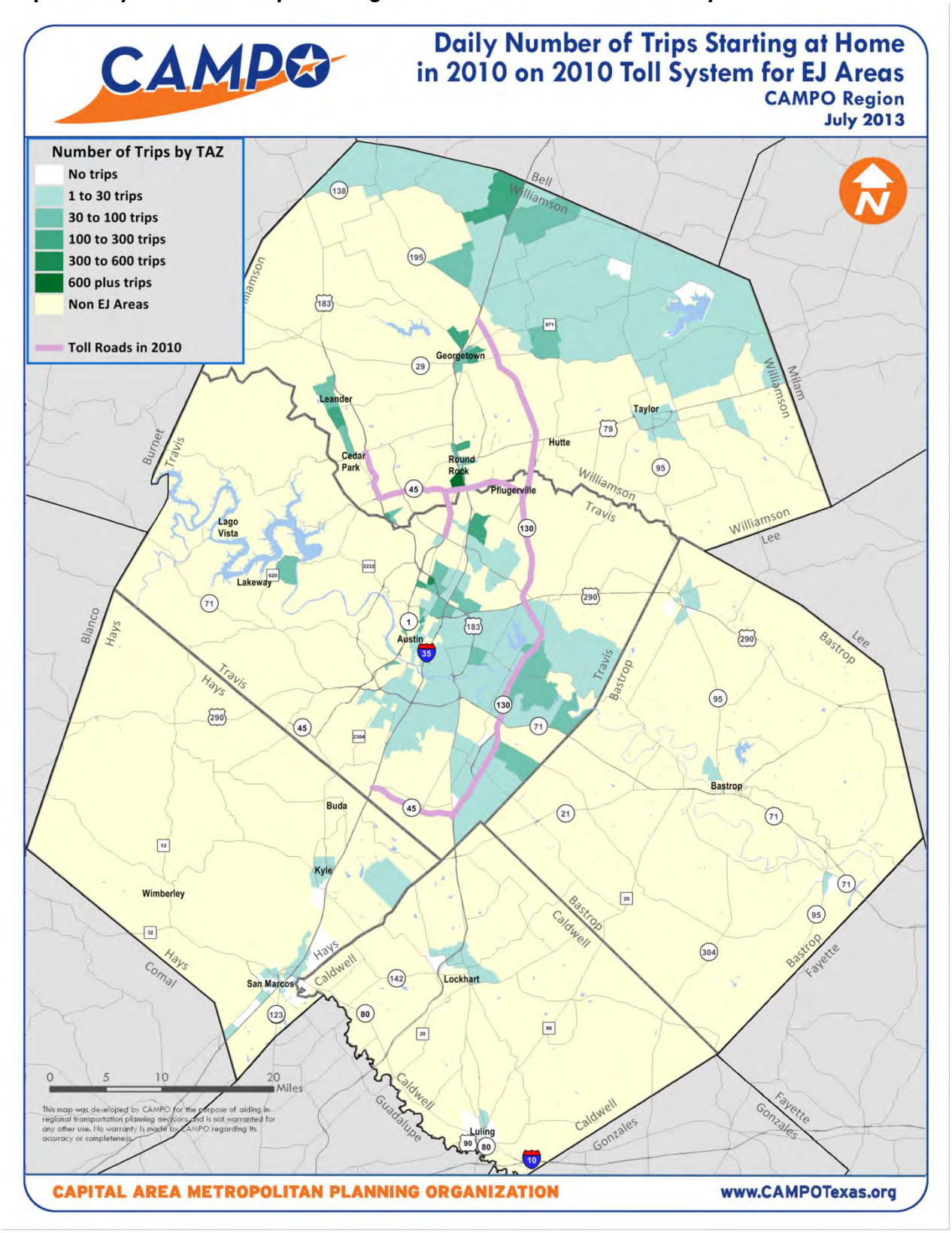
Figure 7 shows the distribution of toll trips originating in EJ TAZs and the distribution of auto toll trips originating in non-EJ TAZs. Maps 7-18 show the number and percentages of tolled trips starting at home for EJ TAZ only, as well as for all TAZs (both EJ and non-EJ). Map 19 shows TAZ boundaries for EJ TAZ and non-EJ TAZ zones.

Figure 7: EJ and Non-EJ TAZ Toll Road Use

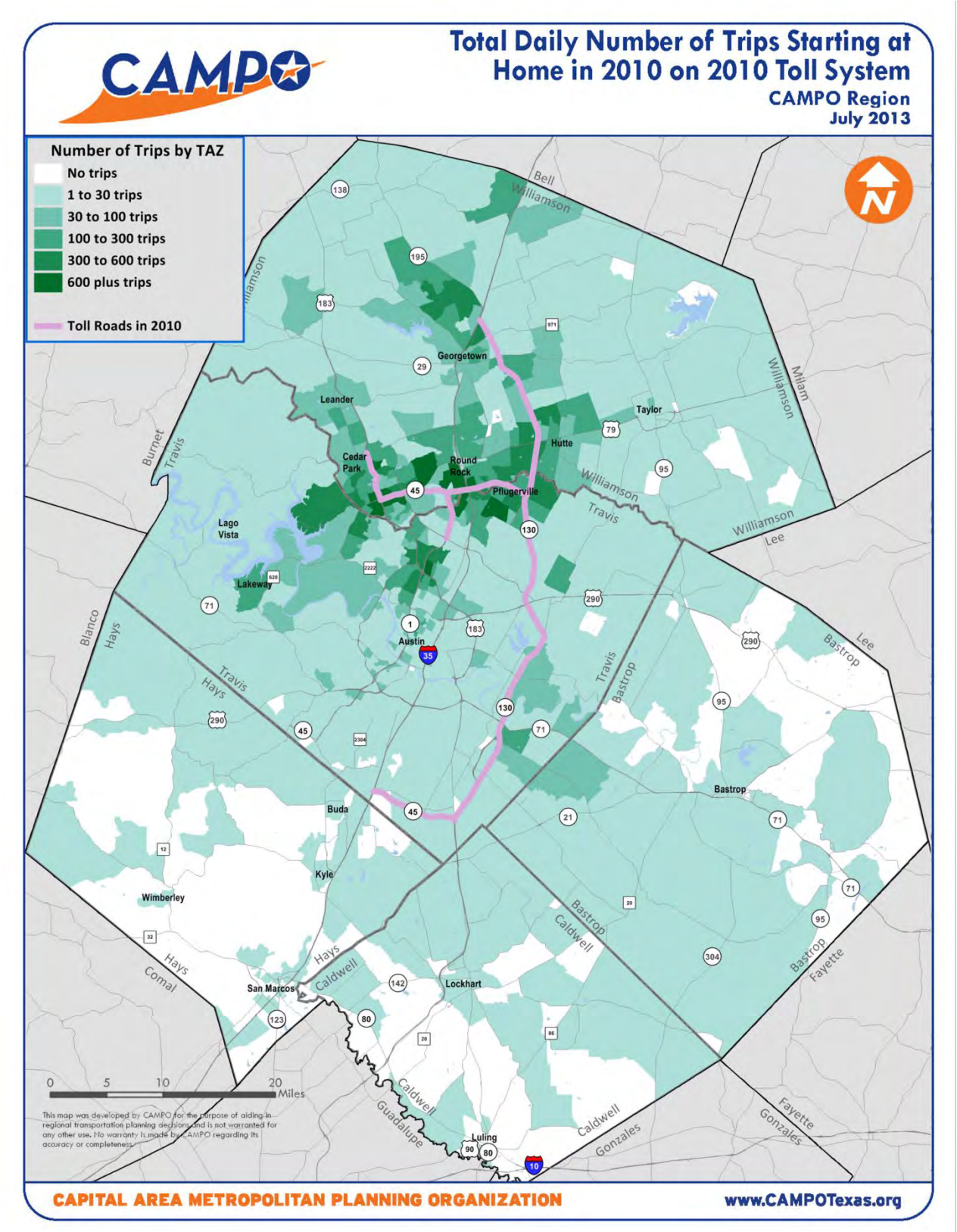
EJ Traffic Analysis Zones (TAZ) and Toll Road Use						
Percentage of EJ Trips on Toll Roads	Existing Network EJ TAZ in 2010		Future Network EJ TAZ in 2035		No-Build Future Network EJ TAZ in 2035	
	Number	Percent	Number	Percent	Number	Percent
0%	58	13.09%	3	0.68%	11	2.48%
>0% to 1.5%	324	73.14%	253	57.11%	307	69.30%
1.5% to 5%	52	11.74%	132	29.80%	67	15.12%
5% to 10%	6	1.35%	45	10.16%	42	9.48%
10% to 20%	3	0.68%	8	1.81%	14	3.16%
>20%	0	0.00%	2	0.45%	2	0.45%

Non-EJ Traffic Analysis Zones (TAZ) and Toll Road Use						
Percentage of Non-EJ Trips on Toll Roads	Existing Network Non-EJ TAZ in 2010		Future Network Non-EJ TAZ in 2035		No-Build Future Network Non-EJ TAZ in 2035	
	Number	Percent	Number	Percent	Number	Percent
0%	171	17.63%	9	0.93%	20	2.06%
>0% to 1.5%	573	59.07%	373	38.45%	562	57.94%
1.5% to 5%	149	15.36%	383	39.48%	225	23.20%
5% to 10%	55	5.67%	127	13.09%	92	9.48%
10% to 20%	18	1.86%	64	6.60%	55	5.67%
>20%	4	0.41%	14	1.44%	16	1.65%

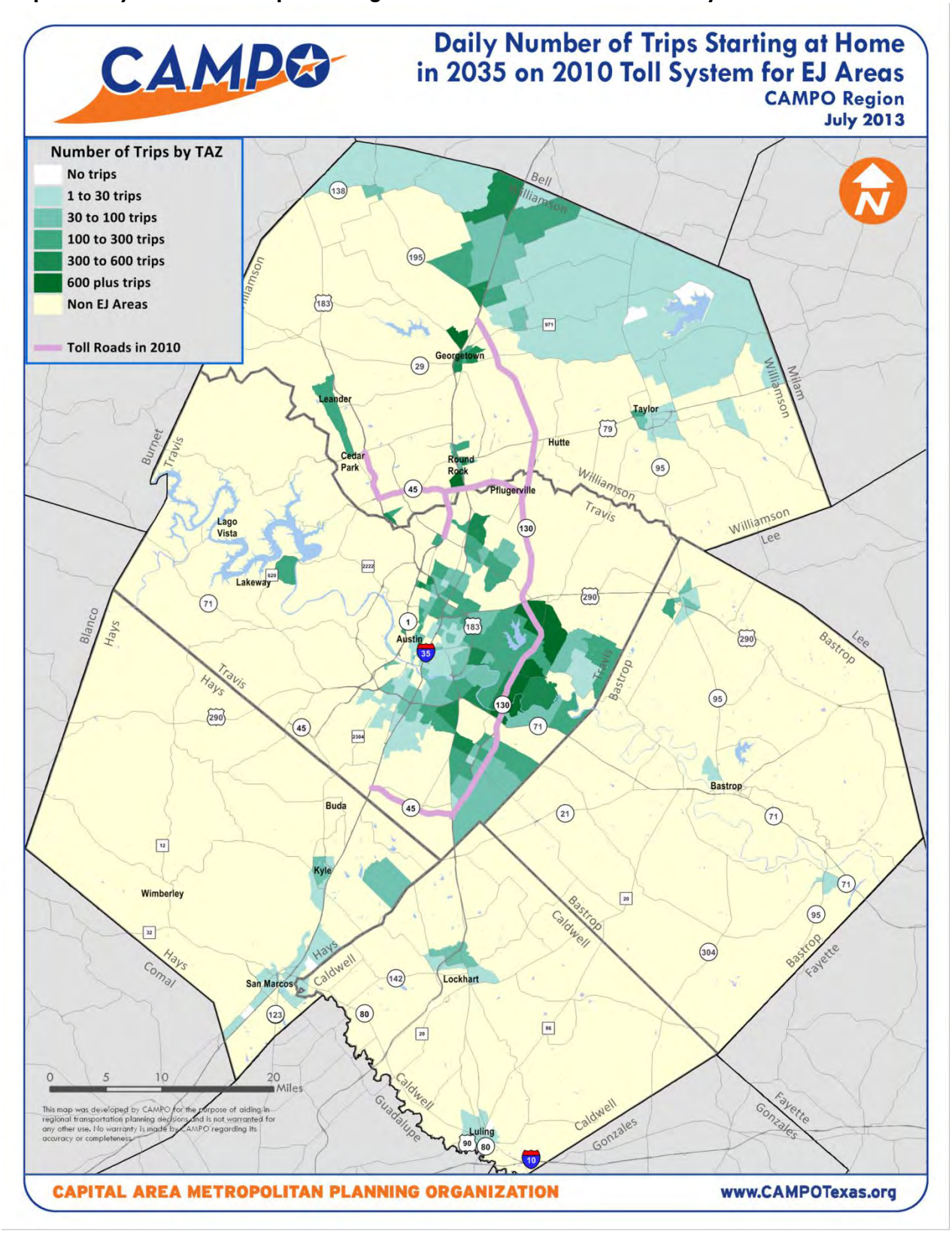
Map 7: Daily Number of Trips Starting at Home in 2010 on 2010 Toll System for EJ Areas



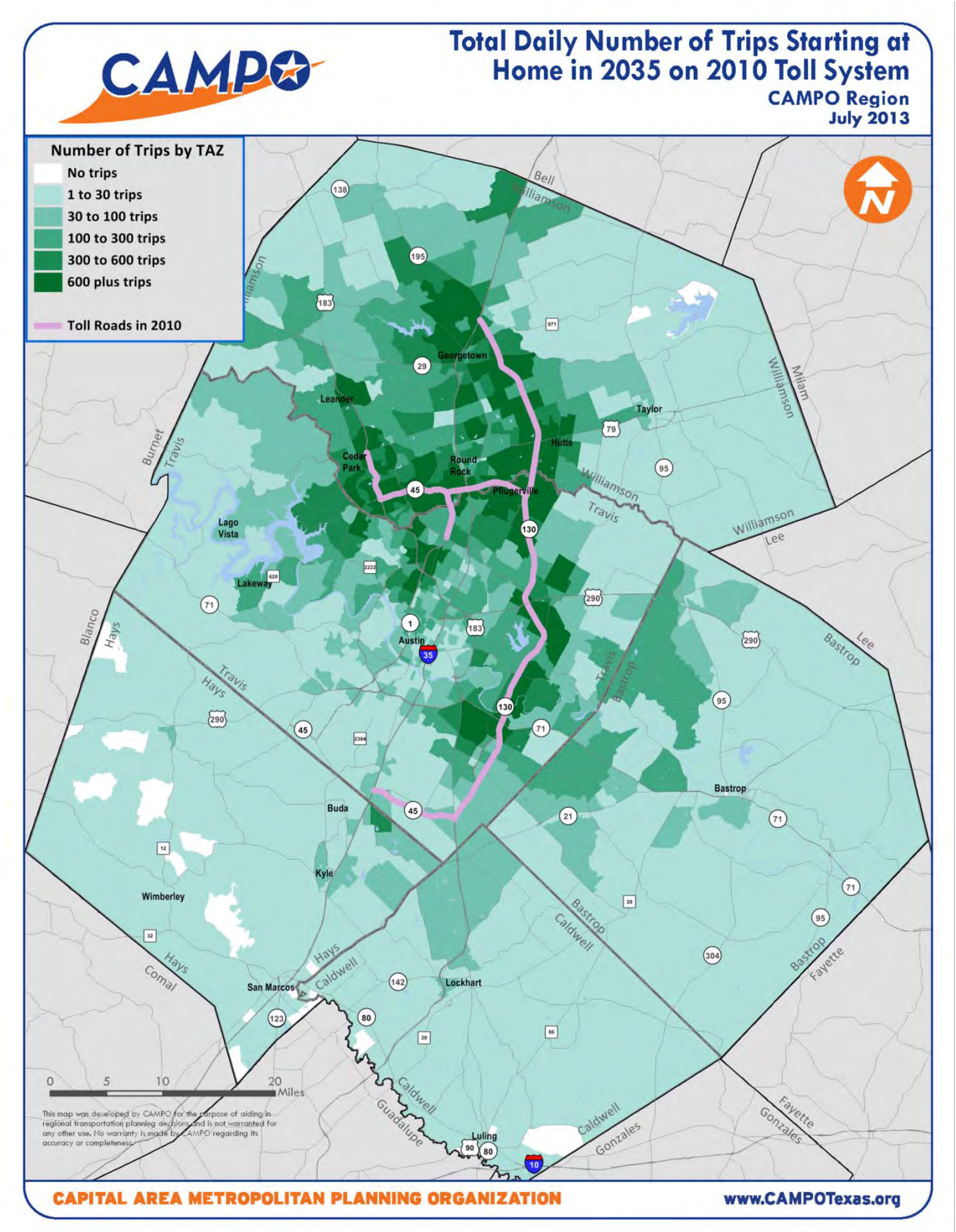
Map 8: Total Daily Number of Trips Starting at Home in 2010 on 2010 Toll System



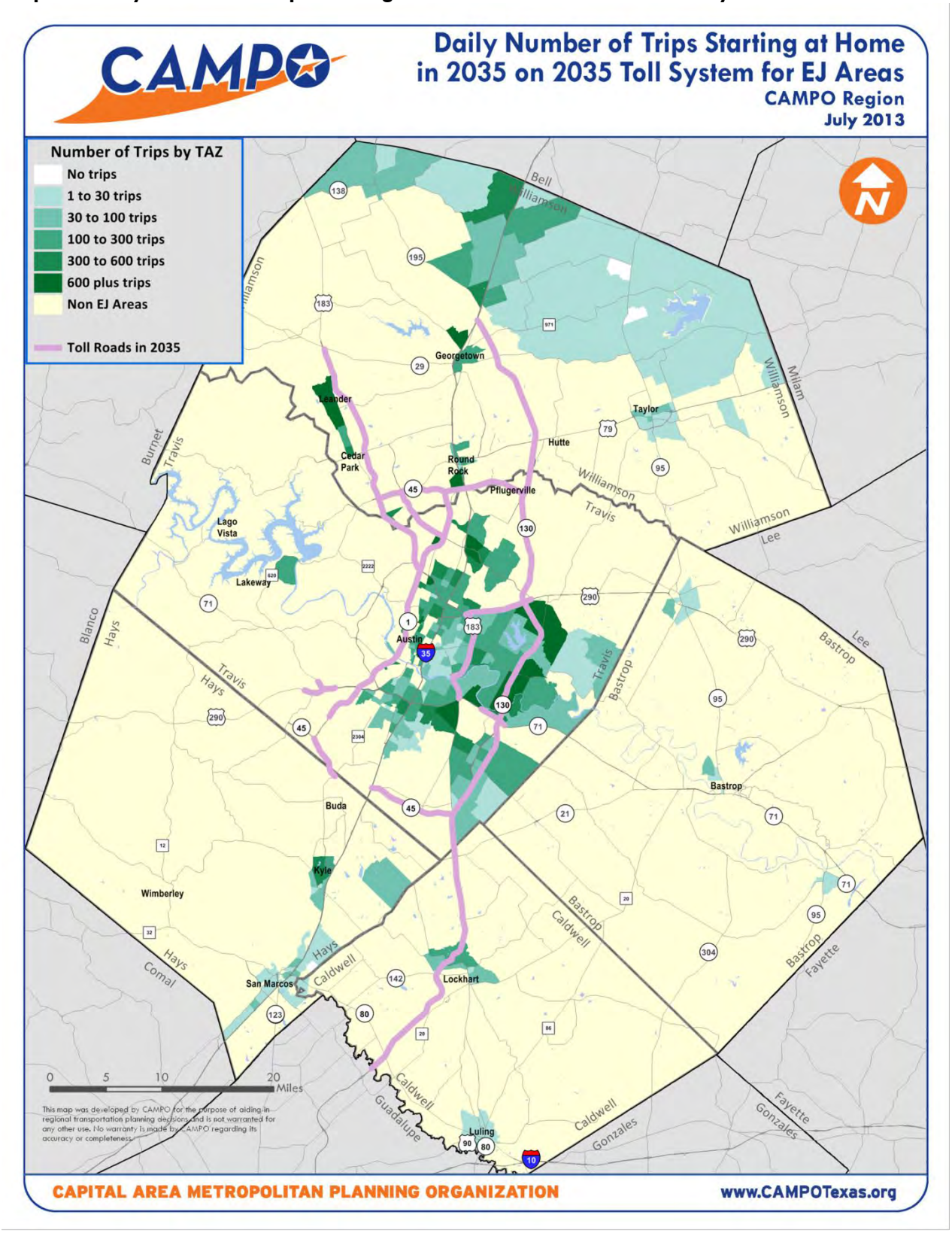
Map 9: Daily Number of Trips Starting at Home in 2035 on 2010 Toll System for EJ Areas



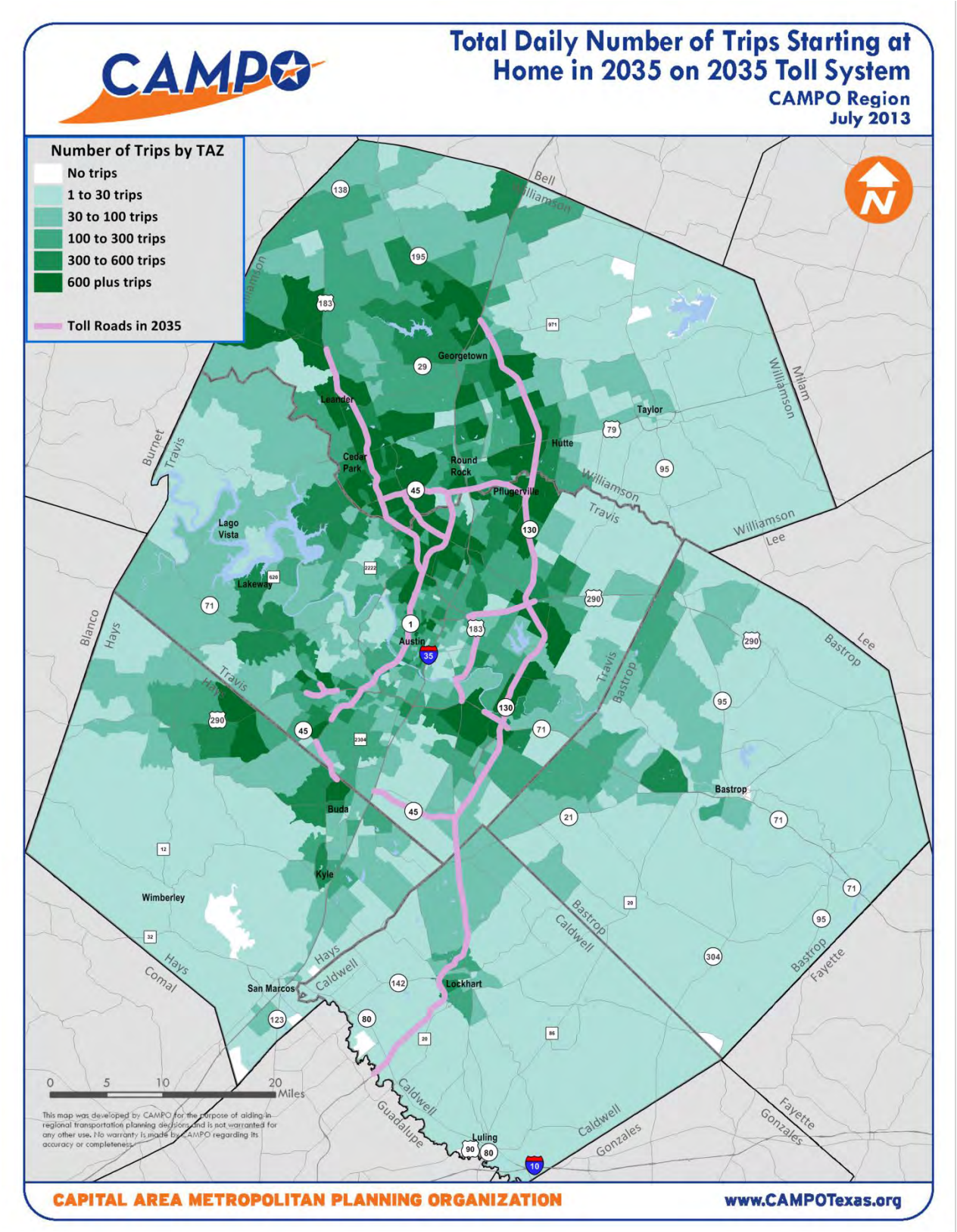
Map 10: Total Daily Number of Trips Starting at Home in 2035 on 2010 Toll System



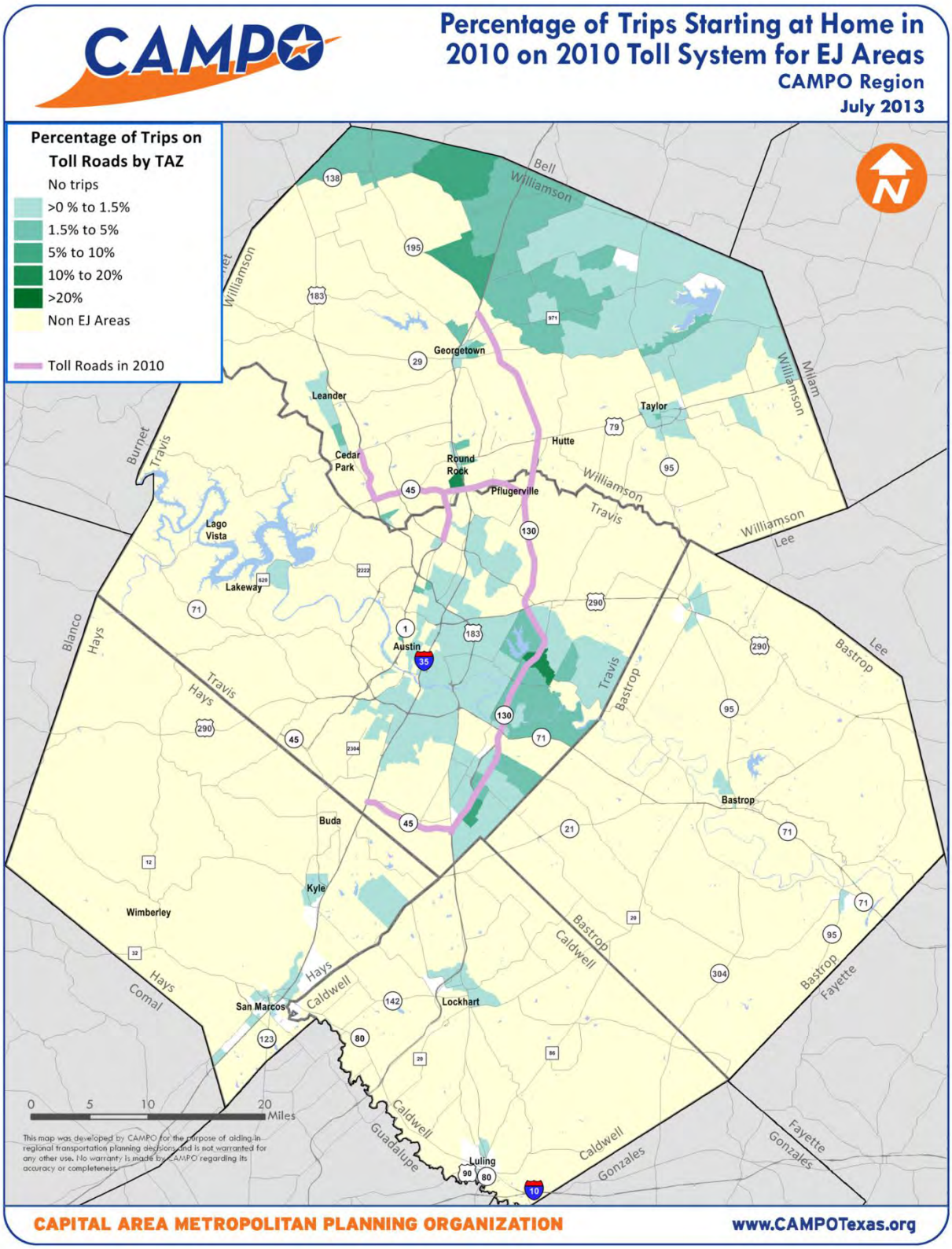
Map 11: Daily Number of Trips Starting at Home in 2035 on 2035 Toll System for EJ Areas



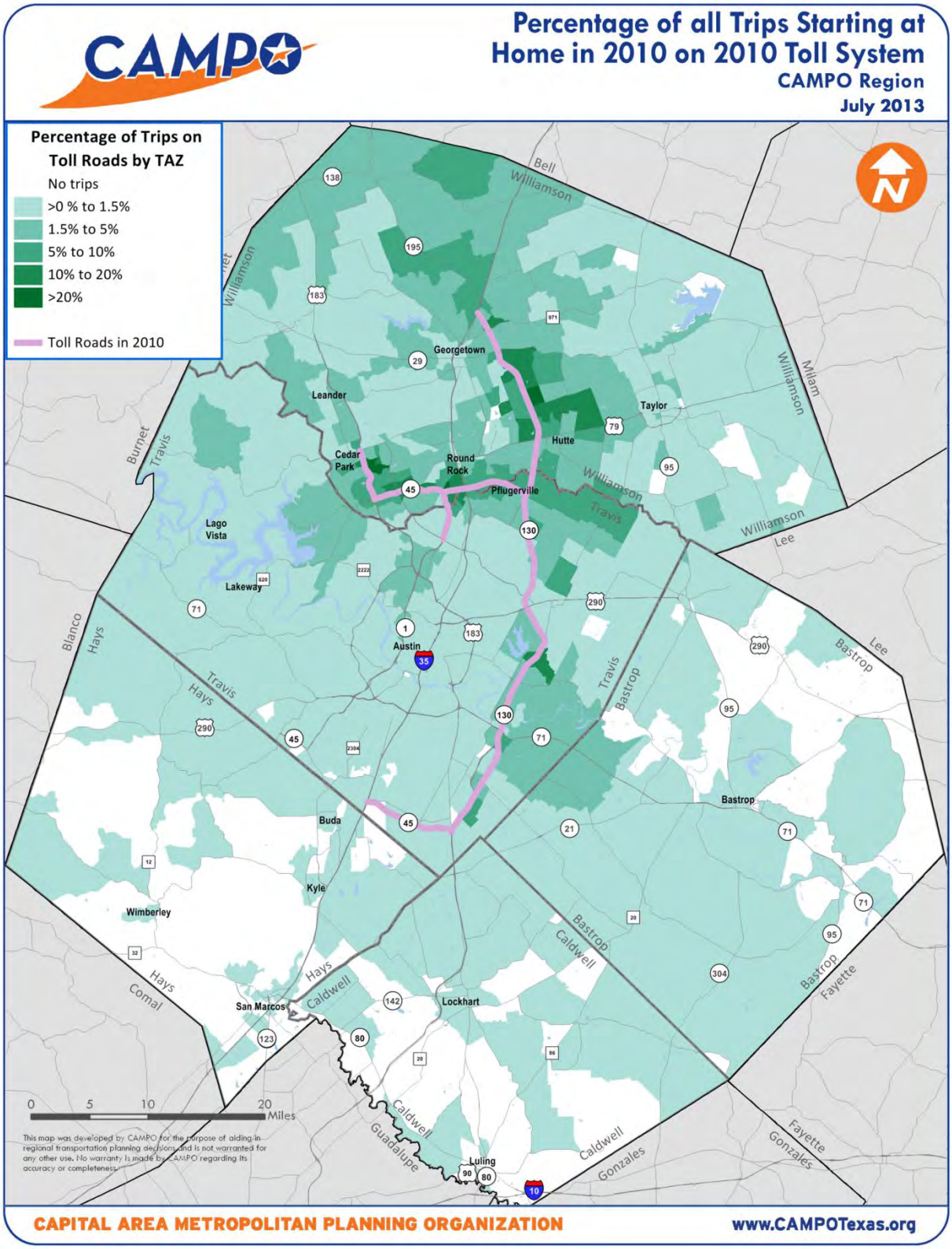
Map 12: Total Daily Number of Trips Starting at Home in 2035 on 2035 Toll System



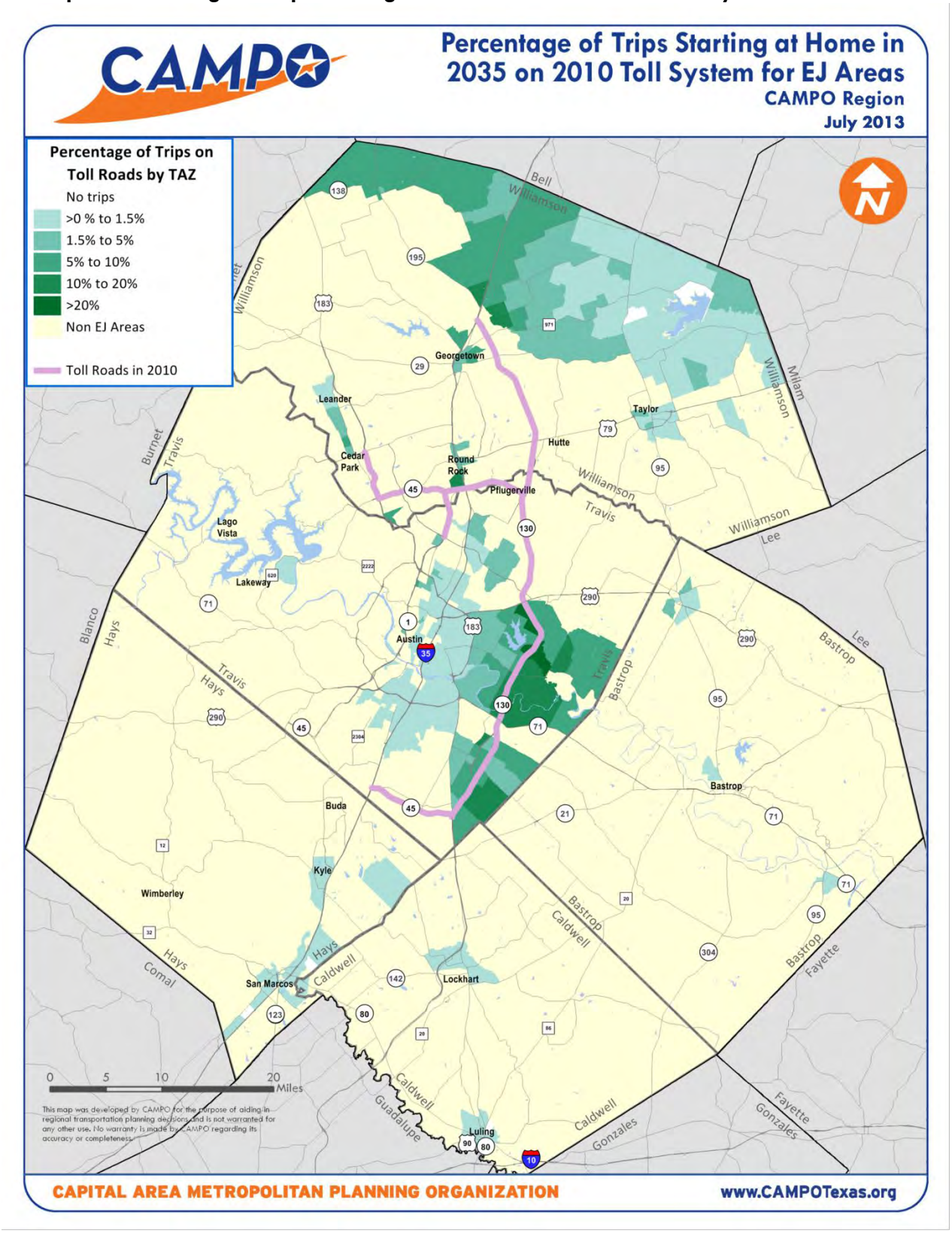
Map 13: Percentage of Trips Starting at Home in 2010 on 2010 Toll System for EJ Areas



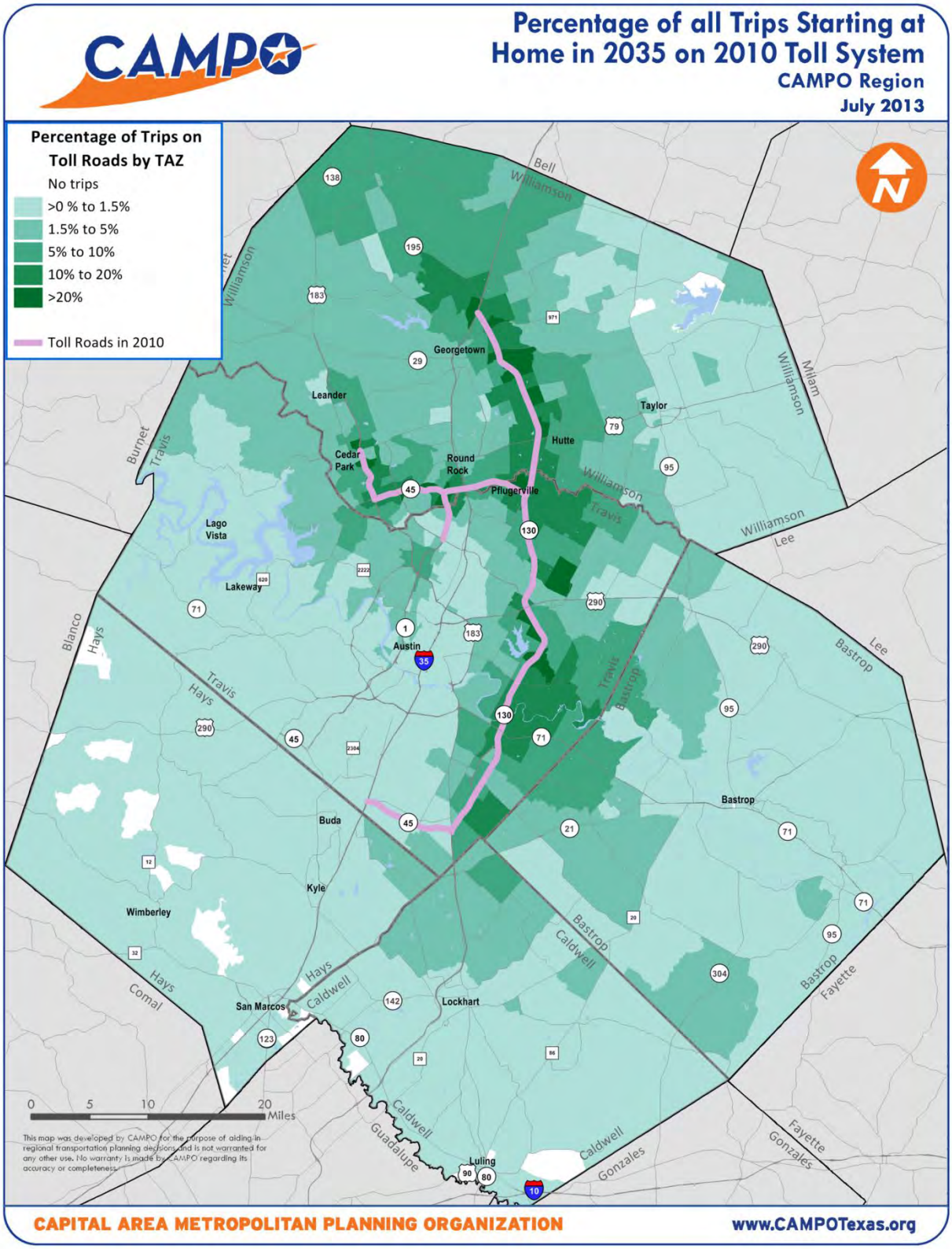
Map 14: Percentage of all Trips Starting at Home in 2010 on 2010 Toll System



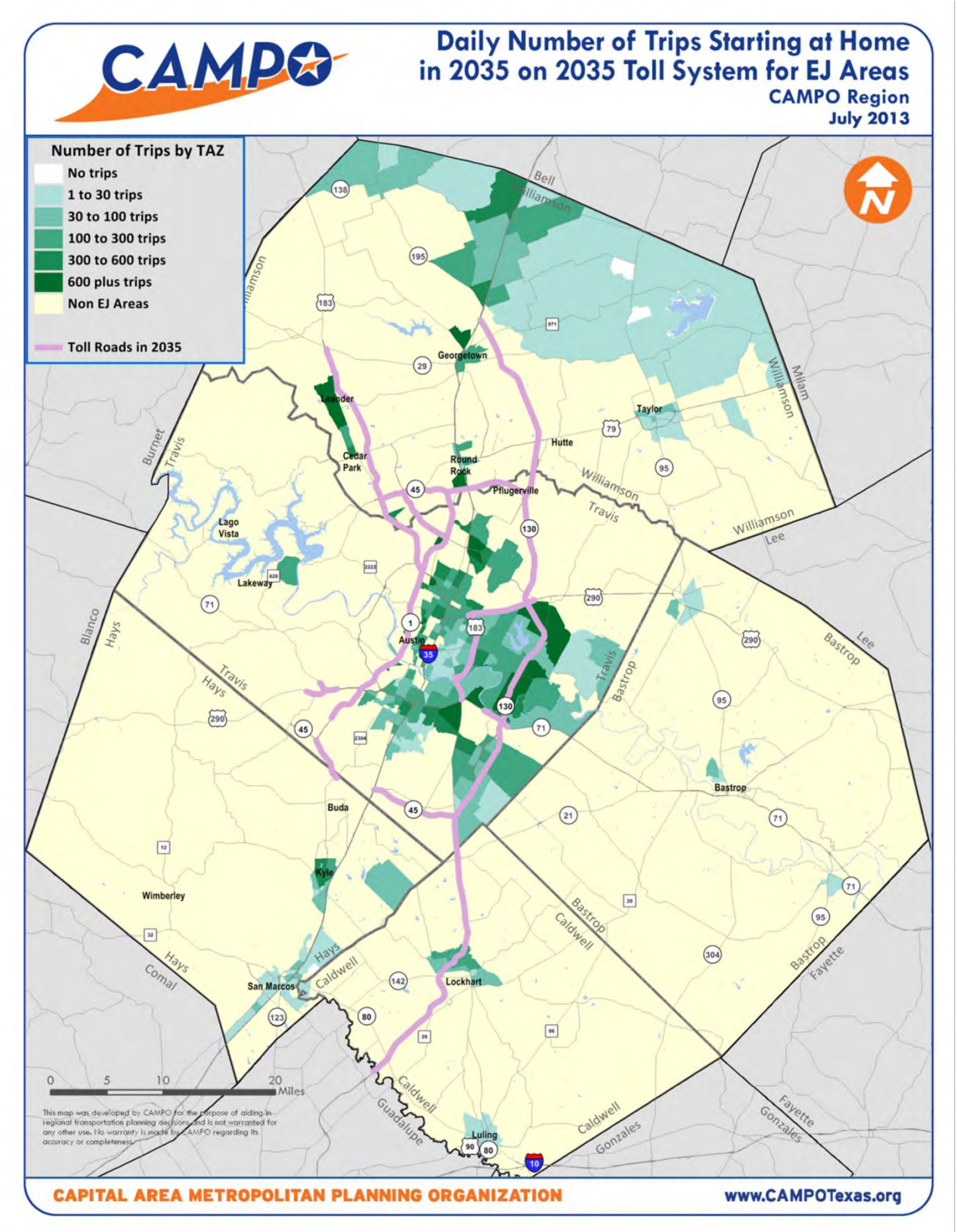
Map 15: Percentage of Trips Starting at Home in 2035 on 2010 Toll System for EJ Areas



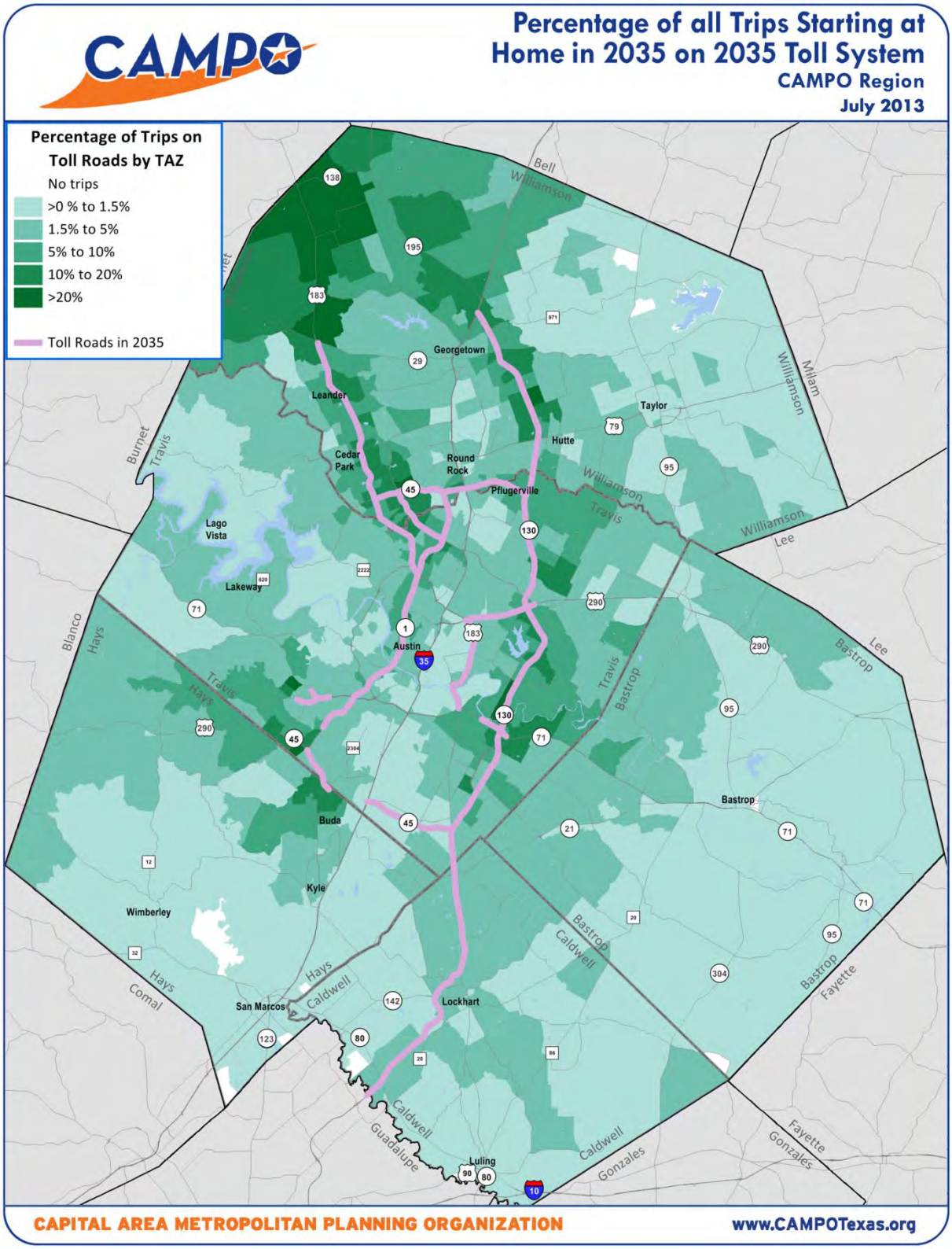
Map 16: Percentage of all Trips Starting at Home in 2035 on 2010 Toll System



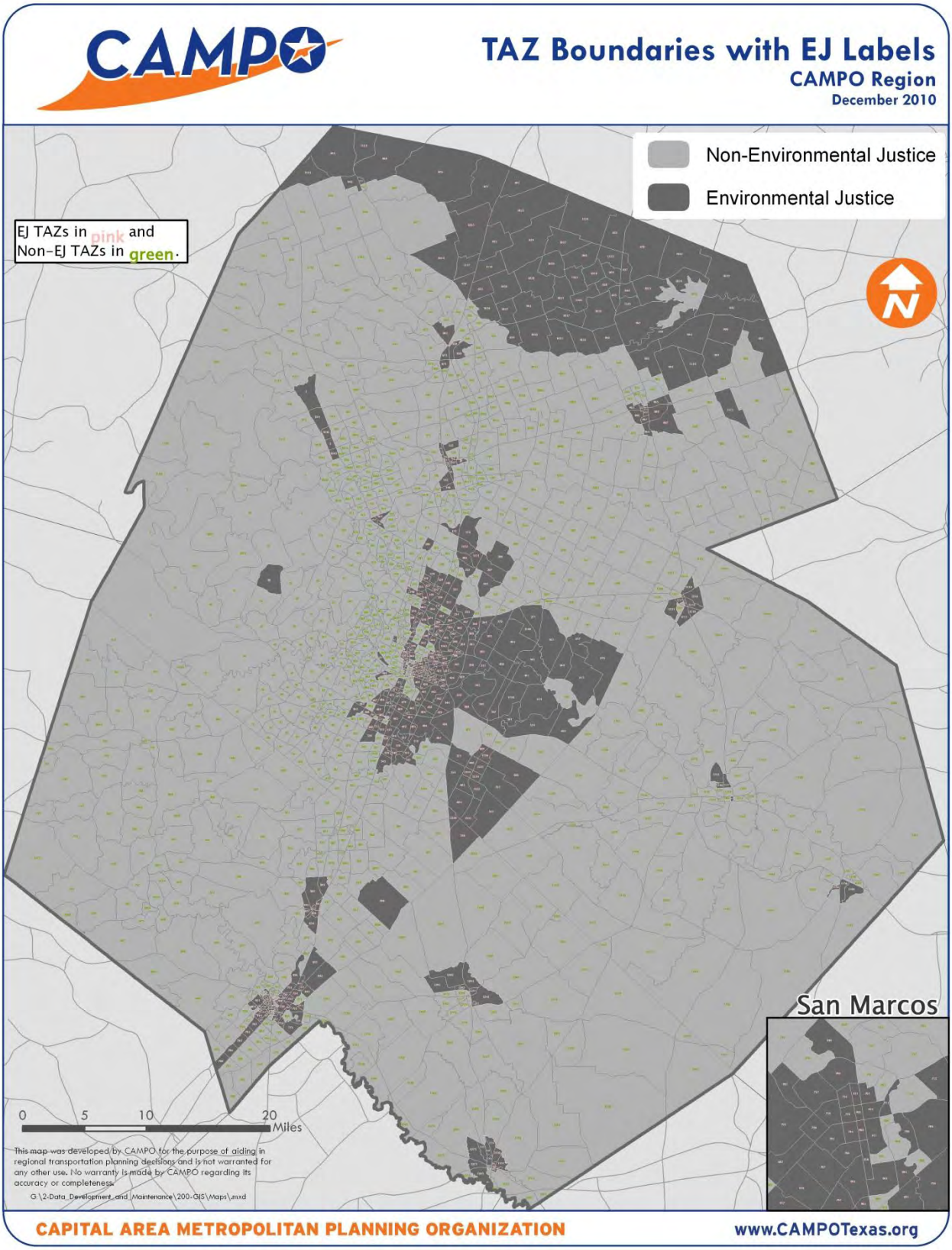
Map 17: Percentage of Trips Starting at Home in 2035 on 2035 Toll System for EJ Areas



Map 18: Percentage of all Trips Starting at Home in 2035 on 2035 Toll System



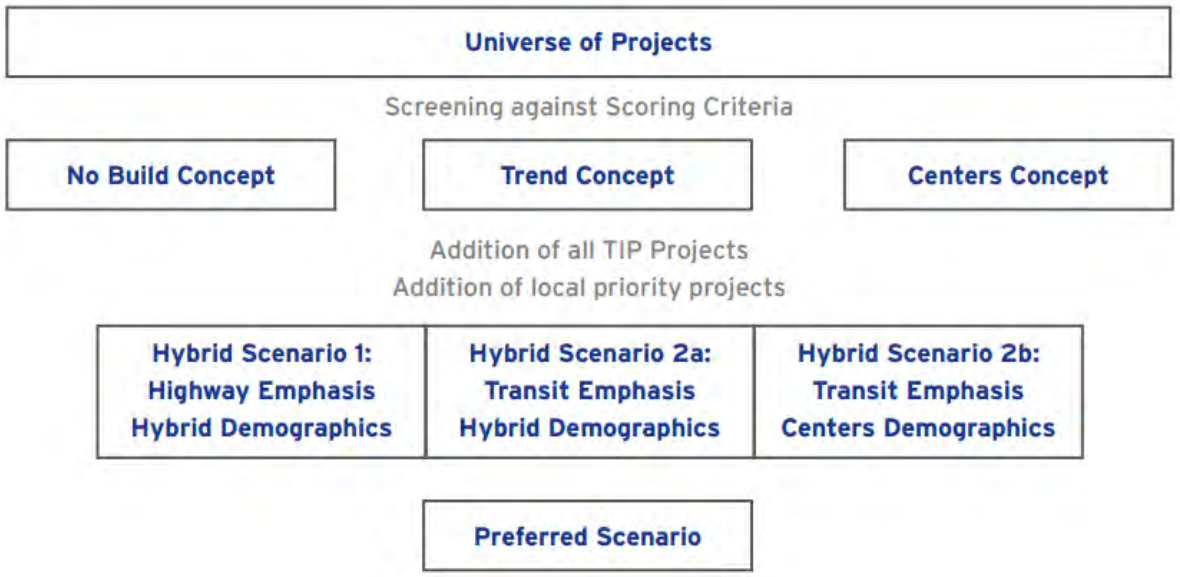
Map 19: TAZ Boundaries with EJ Labels



Land Use Considerations

In order to examine the possible impacts of varied approaches to transportation investment in the region, CAMPO developed and analyzed alternative scenarios for the CAMPO 2035 Plan through an extensive iterative process. Each scenario included a unique combination of transportation projects and land use policies. Investments under all scenarios were roughly financially constrained based on an assumption that the region will have access to approximately $9.5 billion in revenues for new transit and roadway capacity between 2010 and 2035. The illustration below summarizes the alternative scenarios, followed by further explanation.

Figure 8: CAMPO 2035 Plan Alternative Scenarios



Universe of Projects

As a first step in developing alternative concepts, CAMPO developed a "universe of projects". The universe of projects reflects the full un-financially constrained list of transportation projects that had been envisioned for development by CAMPO, TxDOT, Capital Metro, local governments and other transportation providers in the 5-county region. Input for this list came from the CAMPO 2035 Plan, Capital Metro All Systems Go Plan, adopted local arterial plans, local plans in progress including the Williamson County Transportation Plan and Bastrop County Transportation Plan, and agency staff. Some additional potential regional transit projects were also included based on input from Capital Metro, CARTS, and the CAMPO Transit Working Group.

No Build Concept

The No Build Concept assumed that growth trends continued in the region and current committed projects are built, but that no investments are made to add capacity to the transportation system between 2010 and 2035. Under this concept all available funding would be invested in additional operations and maintenance activities.

Trend Concept
The Trend Concept assumed that the density, location, and mix of future development will be driven by a continuation of current policies and market trends. The concept also assumed that projects currently in the investment pipeline will be built. Under the Trend Concept, the remaining funding is invested to continue to build out the region's freeway system and to expand state highways and arterial roadways.

Centers Concept
The Centers Concept assumed that the region establishes policies and incentives to accommodate new growth into multiple high-density, mixed use centers around the region. The concept assumed that some of the projects currently in the investment pipeline do not move forward over the next 25 years. Under the Centers Concept, the funding available is invested to expand the region's public transit system (including buses and rail), to implement a network of high capacity roadway lanes, and to build new arterials serving the mixed use centers.

Additional "Hybrid" Scenarios
After analyzing the No Build, Centers, and Trend Concept and receiving considerable input from the public, CAMPO tested several additional scenarios that combined elements of the Centers and Trend Scenarios. Each of the three hybrid scenarios:
• Assumed implementation of all projects included in the CAMPO Transportation Improvement Program
• Assumed implementation of locally funded projects as prioritized by project sponsors, and
• Assumed that the region would move toward Centers-based demographics

Preferred Scenario
The preferred scenario that is included in the CAMPO 2035 Plan assumes:
• Implementation of all projects included in the current Transportation Improvement Program,
• Implementation of mixed-use activity centers throughout the region;
• Implementation of locally-funded projects as prioritized by project sponsors, and;
• Implementation of additional high priority regional projects, including the regional toll network.

CAMPO 2035 Regional Transportation Plan describes the preferred scenario in more detail.

Land Use Assumptions in the CAMPO Travel Demand Model
CAMPO uses a demographic allocation tool to account for the interaction between land use and transportation in the travel demand model. Future year spatially allocated population and employment data is developed using county level forecast totals for future years, existing spatially allocated data for a base year, and the demographic allocation modeling tool. CAMPO developed county forecast totals for the five counties using an average of the State Demographer's highest (1.0) and medium growth (0.5) scenarios for that county.

CAMPO used 2005 base year data from the E-911 phone database to spatially allocate households to traffic analysis zones. Multiplying the estimated number of households in each TAZ by the estimated household size from an ESRI dataset produced the population for each TAZ. The county population totals were then scaled to match the July 2005 Census estimate (proportionally scaling the population down by TAZ, effectively changing the number of households originally estimated). The analysis uses Texas Workforce Commission ES 202 data to spatially allocate employment to traffic analysis zones for the base year.

The demographic allocation tool is then used to create spatially allocated forecast population and employment on top of the 2005 population and employment base year at a 36 acre grid cell geography. The demographic allocation tool also uses spatial data to determine development restraints, such as the location of flood plains, steep slopes, parks, preserves, cemeteries, and right-of-ways. The tool determines the type of development expected to occur using spatial data from cities and counties, including land use and zoning plans, site plans, subdivision plans and other information. Other allocation geography attributes needed include base year households, base and future year household size, future developable acres and future household and/or employment density.

The tool uses attractor settings to determine the allocation geography's attractiveness to development. The attractiveness level determines the amount of household and/or employment growth each grid cell will receive, constrained by county forecast totals and development restraints. Attractiveness attributes include transportation accessibility measures. Attractiveness can be adjusted using attractor points, attractor constants and activity center class ratings to account for other attractiveness variables. The tool is applied iteratively, the results on one future year are used as the base for the next future year (for example, 2015 results are used as the base for 2025 calculations).

Different transportation network scenarios often result in different demographic allocations. For example, the trend transportation network scenario resulted in a more spatially dispersed demographic allocation than the centers transportation network scenario. The preferred scenario used in the CAMPO 2035 Regional Transportation Plan includes the regional toll network, so the land use effects of the regional toll network are accounted for and integrated into the planning process.

Air Quality Considerations

The counties included in the CAMPO planning area are currently in attainment of all Federal air quality standards. The area is close to nonattainment for ground-level ozone and could be designated nonattainment if the US Environmental Protection Agency formalizes a more stringent ground-level ozone standard. CAMPO contracted with the Texas Transportation Institute (TTI) to conduct preliminary emissions analyses of the regional transportation system (including the regional toll network) envisioned by the CAMPO 2035 Regional Transportation Plan. Results indicate that, even with significant population and VMT growth, the emissions will be lower in 2035 than they are in 2010.

Benefits of Implementing the Planned Transportation System

Implementation of the 2035 planned transportation system, including the regional toll network, will benefit the EJ population. The system envisioned by the 2035 Plan expands travel options by implementing rail, more transit, and more bicycle and pedestrian facilities. The 2035 system also includes an emphasis on mixed-use, transit-friendly growth in activity centers, providing more people the opportunity to work and live near-by. The 2035 system will be less car-dependent and travel opportunities will increase. Several activity centers are located in EJ areas, offering economic development and business opportunities.

The travel time analysis included in this report also provides a measure of the benefit of implementing the planned transportation system. Results of this analysis indicate that existing and 2035 travel times for EJ and non-EJ areas are similar. The general trend for both EJ and non-EJ

areas shows slower travel times in 2035 despite 2035 Plan build-out. This is indicative of substantial population growth and insufficient transportation funding to fully compensate for the growth. One zone pair in Bastrop County showed a probable 2035 travel time disadvantage that met the disproportionate threshold. Since there are no toll roads or managed lanes in this county it is reasonable to assume that the toll roads or managed lanes did not cause or contribute to the disadvantage.

Chapter 3: OPERATIONS

Article 1. TOLL POLICIES

Subchapter A. TOLL RATES

301.001 Priority of Bond Documents

Notwithstanding any conflicting provision in this subchapter or in a prior resolution adopting the Toll Policies, the toll rates and schedules set forth in this subchapter shall always be sufficient to meet or exceed all covenants and requirements set forth in all applicable bond documents and obligations of the authority. If any conflict arises between the bond documents and this subchapter or a prior resolution adopting the Toll Policies, the covenants and requirements of the bond documents shall control to the extent of such conflict.

301.002 Toll Rates

(a) Each toll established by this section is subject to an adjustment on January 1 of each year under the procedure set forth in Sec. 301.003 (Annual Toll Rate Escalation). The executive director is authorized and directed to edit a toll established by this section to update and certify any change to a toll made pursuant to Sec. 301.003.

(b) The toll for a passenger car (2 axles) charged at each 183A Turnpike toll gantry is as follows:

183A Turnpike Toll Gantry	Transponder Customer Toll (e.g., TxTAG)	Pay By Mail (Video Tolling) Customer Toll
Crystal Falls Ramps	$0.38	$0.51
Crystal Falls Mainline	$0.99	$1.32
Scottsdale Drive Ramp	$0.56	$0.74
Park Street Mainline	$1.40	$1.86
Brushy Creek Ramps	$0.56	$0.74
Lakeline Mainline	$0.52	$0.69

(c) Beginning on the date Phase 1 of the Manor Expressway is open to traffic and ending on the date the entire length of the Manor Expressay is open to traffic, the toll for a passenger car (2 axles) charged at each Manor Expressway toll gantry is as follows:

Manor Expressway Toll Gantry	Transponder Customer Toll (e.g., TxTAG)	Pay By Mail (Video Tolling) Customer Toll
US 183 Direct Connectors	$0.50	$0.67
Springdale Road Ramps	$0.50	$0.67

(d) Beginning on the date the entire length of the Manor Expressway is open to traffic, the toll for a passenger car (2 axles) charged at each Manor Expressway toll gantry is as follows:

Toll Gantry	Transponder Customer Toll (e.g., TxTAG)	Pay By Mail (Video Tolling) Customer Toll
US 183 Direct Connectors	$0.53	$0.71
Springdale Road Ramps	$0.53	$0.71
Giles Lane Ramps	$0.53	$0.71
Giles Lane Mainline	$1.06	$1.41
Harris Branch Parkway Ramps	$0.53	$0.71
Parmer Lane Mainline	$0.53	$0.71

(e) A vehicle with more than two axles will pay the applicable toll rate for a passenger car (2 axles) times (n-1), with "n" being the number of axles on the vehicle.

301.003 **Annual Toll Rate Escalation**

(a) The following provisions are fully adopted and made a part of this subchapter and may be incorporated in any Trust Indenture or Supplemental Trust Indenture issued in conjunction with bond financing to be utilized for the financing of the construction and development of projects by the authority (defined terms in these provisions shall be in accordance with the terms and definitions set forth in the Master Trust Indenture and any applicable Supplemental Trust Indenture):

> Subject in all instances to the provisions, requirements and restrictions of the Master Indenture, as amended and supplemented from time to time, beginning on October 1, 2012 and on each October 1 thereafter (the "Toll Escalation Determination Date"), a percentage increase in the Toll rates charged on all toll facilities in the Turnpike System will be determined in an amount equal to the Toll Rate Escalation Percentage. The Toll Rate Escalation Percentage, as calculated on each Toll Escalation Determination Date, shall be reported to the board each year at its October board meeting. The percentage increase in the Toll rates shall be effective on the January 1 of the next calendar year, unless at such board meeting the board affirmatively votes to modify the Toll Rate Escalation Percentage. If the board votes to modify the Toll Rate Escalation Percentage, the Toll rate increase to be effective on January 1 of the next calendar year shall be based on the modified Toll Rate Escalation Percentage.

(b) For purposes of determining the Toll Rate Escalation Percentage, the following capitalized terms shall have the meanings given below:

(1) "Toll Rate Escalation Percentage" = shall mean a percentage amount equal to $[(CPI^{t} - CPI^{t-12})/CPI^{t-12}]$. In the event the Toll Rate Escalation Percentage is calculated to equal less than 0%, then the Toll Rate Escalation Percentage shall be deemed to equal 0%.

(2) "CPI^{b}" = the most recently published non-revised index of Consumer Prices for All Urban Consumers (CPI-U) before seasonal adjustment ("CPI"), as published by the Bureau of Labor Statistics of the U.S. Department of Labor ("BLS") prior to the Toll Escalation Determination Date for which such calculation is being made. The CPI is published monthly and the CPI for a particular month is generally released and published during the following month. The CPI is a measure of the average change in consumer prices over time for a fixed market basket of goods and services, including food, clothing, shelter, fuels, transportation, charges for doctors' and dentists' services, and drugs. In calculating the index, price changes for the various items are averaged together with weights that represent their importance in the spending of urban households in the United States. The contents of the market basket of goods and services and the weights assigned to the various items are updated periodically by the BLS to take into account changes in consumer expenditure patterns. The CPI is expressed in relative terms in relation to a time base reference period for which the level is set at 100.0. The base reference period for the CPI is the 1982-1984 average.

(3) "CPI^{t-12}" = the CPI published by the BLS in the month that is 12 months prior to the month used to established CPI^{t}.

(4) If the CPI is discontinued or substantially altered, as determined in the sole discretion of the authority, the authority will determine an appropriate substitute index or, if no such substitute index is able to be determined, the authority reserves the right to modify its obligations under this section.

301.004 **Exemption from Toll**

(a) Users of toll facilities are required to pay the toll established by this subsection unless exempted by state law, or as authorized by the board under state law and the bond documents.

(b) Pursuant to Sections 370.177, 362.901, and 541.201, Transportation Code, the authority will create technical procedures to ensure that authorized emergency vehicles, as well as state and federal military vehicles, are exempt from paying tolls on the authority's toll facilities.

(c) Pursuant to Section 370.177, Transportation Code, and to facilitate a multi-modal transportation system that ensures safe and efficient travel for all individuals in Central Texas, public transportation vehicles with a carrying capacity of 16 or more individuals that are owned or operated on behalf of the Capital Metropolitan Transportation Authority or the Capital Area Rural Transportation System are exempt from paying tolls on the authority's toll facilities.

301.005 **Discounts and Incentives**

(a) A primary objective of the authority's marketing and public information program is to encourage enrollment of as many customers as possible in interoperable transponder programs. Transponder programs that are interoperable with the authority's facilities currently include the Texas Department of Transportation's TxTag; the North Texas Tollway Authority's TollTag; and the Harris County Toll Road Authority's EZ TAG. The board will determine appropriate introductory and marketing activities on a project-by-project basis by separate resolution, which may include, but not be limited to, those described in subsection (b).

(b) During the initial start-up phase of tolling on a particular project, incentives to customers may be offered depending on the level of toll tag enrollment, such as the following discounts and incentives:

(1) The authority may offer incentives with each new toll project that is opened to encourage ridership.

(2) The authority may offer discounts for transponder users from the toll amount paid by Pay By Mail toll customers.

Subchapter B. TOLL COLLECTIONS

301.006 **Purpose**

This subchapter establishes practices and operations for toll collection systems on designated controlled-access toll roads operating within the turnpike system, and incorporates provisions of Section 370.177, Transportation Code, regarding failure or refusal to pay turnpike project tolls and related penalties and offenses.

301.007 **Transponder Account**

A customer may establish a transponder account by contacting any interoperable Customer Service Center ("CSC"). A transponder is an electronic device that records the presence of a vehicle on a toll road and is usually attached to the windshield of the vehicle. Each CSC that is interoperable with the authority's toll facilities has its own user agreement concerning requirements to open and maintain a transponder account.

301.008 **Unauthorized Transfer of Transponder**

A transponder that is interoperable with the authority's toll facilities is for use with one vehicle per transponder, and should not be transferred to another vehicle once the transponder is attached to the original vehicle's windshield. Transfer of a transponder to a vehicle other than the original vehicle is against authority policy. If a transponder is transferred to another vehicle in violation of this section, the authority may refuse to recognize an electronic toll transaction incurred with respect to an unauthorized vehicle.

301.009 **Video Billing**

(a) The authority offers video billing as payment option for customers that use the authority's toll facilities without a transponder account. The authority, through its Violations Process and Toll Collection Provider (the "Collections Contractor"), will use the license plate information of a vehicle that does not have a valid toll transponder but travels on the authority's toll facilities to determine the registered owner of such a vehicle via an interface with Vehicle Title Registration or similar institution.

(b) The Collections Contractor will send an invoice to the registered owner of the vehicle and accept payment on behalf of the authority. The Collections Contractor will add a $1.00 handling fee for each invoice. The Collections Contractor will retain the additional toll surcharge and handling fee to cover their cost and forward the toll payments to the authority. All toll bills/invoices require payment within 30 days of the date thereof.

301.010 Establishment of Administrative Fee for Unpaid Tolls

(a) Section 370.177, Transportation Code, authorizes the assessment and collection of an administrative fee to recover the authority's cost of collecting unpaid tolls. An administrative fee may not exceed $100.00 per unpaid toll. The authority has determined that such fees may vary depending on how far in the collection process a delinquent account proceeds.

(b) The current administrative fee shall be applied at each phase of the collection process. This means that upon issuance of a notice of non-payment, a $15.00 administrative fee shall be collected in addition to the unpaid toll and any other fees that are due.

(c) If payment is not received in connection with the first notice of non-payment, and a second notice of non-payment is sent, an additional $15.00 administrative fee shall become due. Therefore, full payment of a second notice of non-payment will require payment of $30.00 in administrative fees, in addition to all other amounts due.

(d) If payment is not received in connection with either the first or second notice of non-payment, the unpaid account shall be considered for collection, an additional $30.00 administrative fee shall become due, and the cumulative administrative fee due shall be $60.00.

(e) The board recognizes that the amount of the administrative fee should be subject to periodic change when collection costs and associated matters are considered. Therefore, the board delegates the authority to revise the administrative fee, or any aspect thereof, to the executive director, in consultation with the director of operations, and the executive director may revise an administrative fee by written amendment. The executive director shall give notice to the board of any such revision at the next regularly scheduled board meeting after the revision is put into effect.

301.011 Customer Service and Violation Policies

(a) A tolerant and customer-friendly approach will be employed towards customers who use the road without paying the required toll. While it is understood that the objective of the authority is to collect revenue and minimize toll violation abuse, the authority believes that a moderate approach towards customers who did not pay the toll ultimately will allow for a period of adjustment as customers begin using the toll roads, and will create new toll customers for the authority.

(b) The authority will establish a "Violation Processing Center (VPC)" where vehicle images captured at the toll collection point and for which no toll was paid will be reviewed and processed according to authority policies in accordance with the toll enforcement process established by state law. Repeat offenders will be issued notices of nonpayment and will be given the opportunity to make outstanding toll and administrative payments. Failure to respond to the established customer contact process and to satisfy outstanding, unpaid toll amounts will result in the issuance of citation and prosecution in accordance with state law.

301.012 **Procedures for Disputing Toll Violations**

(a) A customer may dispute an alleged failure to pay a toll on the authority's web site or by contacting the CSC where a valid transponder account has been established.

(b) A customer who has contacted a CSC or the authority's collection contractor and has been unable to satisfactorily resolve a dispute regarding a toll violation may submit a written appeal to the authority. Such appeal shall be for the purposes of the customer providing the authority with the information upon which they base their appeal. The authority may or may not determine that there is any merit to such appeal and is not required to undertake any formal proceedings to make such determination.

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APPENDIX G
STUDY AREA PHOTOGRAPHS

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Photo 1: Terminus of proposed project at MoPac/SH45 South

Photo 2: Area where proposed project will cross Bliss Spillar Rd.

Photo 3: Old Bliss Spillar Rd within TxDOT ROW.

Photo 4: Terminus of proposed project at FM 1626.

Photo 5: Representative photo of Edwards Plateau: Savanna Grassland within the northern portion of the state-owned ROW.

Photo 6: Representative photo of Native Invasive: Mesquite Shrubland in southern portion of the state-owned ROW.

Photo 7: Representative photo of Edwards Plateau: Ashe Juniper Slope Forest within the state-owned ROW.

Photo 8: Tributary to Slaughter Creek in the northwestern portion of the state-owned ROW.

Photo 9: Tributary to Slaughter Creek located in the northwestern portion of the state-owned ROW. Photo taken facing downstream (southeast); the riprap gabion is visible in the center.

Photo 10: Bear Creek, facing west (upstream).

Photo 11: Bear Creek, facing east (downstream).

Photo 12: Grey Rock Ridge subdivision as seen from TxDOT ROW.

Photo 13: View from Shady Hollow Estates as seen from Red Mesa Hollow looking towards the TxDOT ROW.

Photo 14: View from Arrowhead Acres as seen from Bliss Spillar Rd. looking towards the TxDOT ROW.

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APPENDIX H
WATER QUALITY AND AQUATIC RESOURCE PROTECTION TECHNICAL REPORT

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State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626

Travis and Hays Counties, Texas

Water Quality and Aquatic Resource Protection Technical Report

Prepared by:

Texas Department of Transportation

CSJ: 1200-06-004 & 1200-07-001

January 2015

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1.0 INTRODUCTION

A new location, four-lane, controlled access toll facility is proposed to extend from State Loop 1 (MoPac) to Farm-to-Market (FM) Road 1626. Known as SH 45SW, the proposed project would be approximately four miles long and provide improved system connectivity, local mobility, and an alternative route to congested local roadways. The study area for the proposed project encompasses a rectangular shaped area of approximately 5,327 acres, extending from 0.8 mile west and 0.6 mile north of the SH 45/MoPac interchange southeast to FM 1626. The study area is approximately two miles wide by approximately 4.3 miles long, as shown in **Figure 1.1-1**. The study area, which was presented during the Environmental Impact Statement (EIS) scoping process, is of sufficient size to allow for a comprehensive evaluation of potential project-related effects on a broad range of resources while being constrained enough to ensure focused and relevant project-related analysis.

This Technical Report is intended to document the integrated approach that would be used to protect water quality and other aquatic resources in the study area and beyond.

1.1 Water Quality

The SH 45SW corridor crosses an area which is known to contribute to Edwards Aquifer recharge via surface and groundwater conduits. Protection of water quality has been the primary concern voiced by public and agency stakeholders and has been a key focus of project planning and design. Water quality associated with the proposed project could impact aquatic resources across a larger geography without proper controls, given the regional nature of aquifer recharge and especially the hydrologic connection to Barton Springs. An adequate consideration of water quality in the study area requires an understanding of several climatic and geologic elements that influence local hydrologic patterns. These natural elements determine how water moves into and through the study area. The movement of water, particularly its path, its speed, and the landscape elements it comes into contact with, can directly change aspects of its quality and the impacts that are associated with its quality. Surface water and groundwater quality are interrelated due to the recharge characteristics of the Edwards Aquifer. Robust water quality protections have been incorporated in the SH 45SW design process in order to avoid harm to sensitive aquatic resources, including aquifer-dependent species such as the Barton Springs salamander and Austin blind salamander.

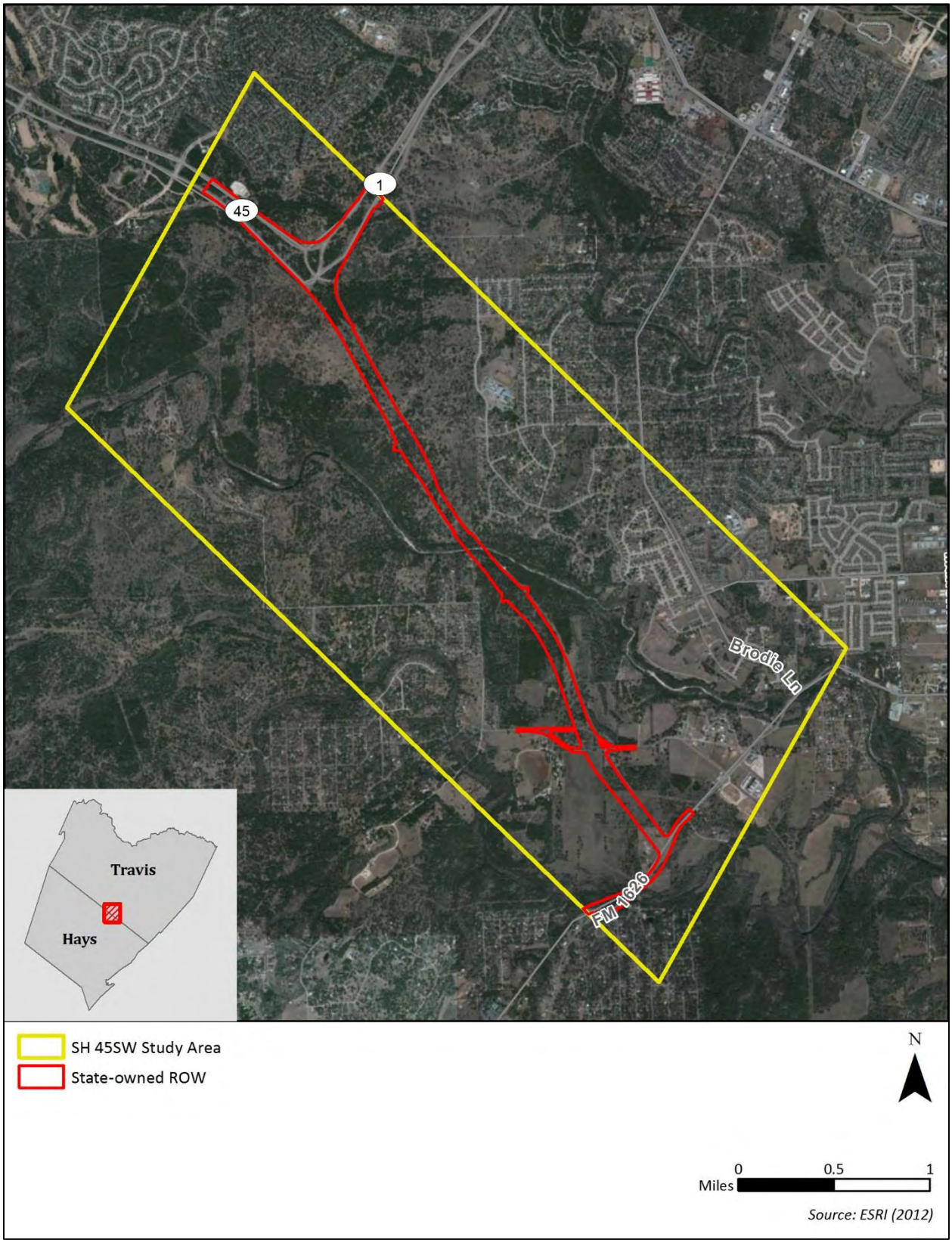
Water quality is monitored by several entities at the local, regional, state, and federal levels. Quality is based on physical and chemical characteristics in the waterbody and often is measured against pre-designated waterbody uses which might include aquatic life protection, human recreation, or drinking water. Water quality data are made available by various agencies and these data will be used in this report to provide context for the current state and recent trends in water quality. Though sampling protocols and periodicity may vary by agency,

meaningful information may be gained by the congregation and comparison of water quality monitoring results.

In addition to discussions regarding surface and ground water, this report will also discuss the quality of stormwater runoff, especially as it pertains to runoff from roadway surfaces and other developed areas. Typical runoff characteristics have been extensively studied, and much effort has been focused on mitigating any detrimental effects that runoff may have on water quality and the ecosystems that depend on its protection. Data will be presented on the mitigating effects of a wide range of structural elements and other water quality treatment measures that can protect these resources.

Pre-project planning and the consideration of possible environmental impacts by a Water Quality Technical Workgroup-Engineering Subcommittee has identified several key construction practices that should be integrated into the environmental process as the proposed project advances. Those practices include phased construction, limiting the area of disturbance, installing the applicable permanent BMPs in the early stages of construction, prevention of natural drainage from outside the state-owned right-of-way (ROW) from mixing with construction runoff prior to treatment, separating and treating construction runoff, and construction oversight by an independent, on-site environmental compliance manager (see **Attachment 2**). By adhering to these principles and an overall commitment to protecting the sensitive environmental resources of the project area, the proposed SH 45SW project may be accomplished with minimal negative impacts.

Figure 1.1-1: SH 45SW Study Area



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2.0 CONCEPTUAL WATER QUALITY IMPACTS

2.1 Temporary/Construction Phase Potential Impacts

An understanding of potential impacts associated with roadway construction over the Edwards Aquifer Recharge Zone is important in order to identify appropriate protection measures to include in the proposed project. Roadways in general have the potential to impact water quality and quantity during both their construction and operation phases. These water quality impacts arise primarily, though not wholly, from the effects that roadways can have on stormwater runoff. During the construction phase, site preparation activities such as grading, excavating, trenching, boring, and clearing vegetation result in exposed soil. In addition to this disturbance of native soil, it is often necessary to bring new soil onto the site to be used, for example, in building up roadbeds. Construction sites, therefore, may create extensive areas of loose soil that are particularly susceptible to erosion. Though these areas of loose soil are not permanent, they may be highly erodible until final revegetation of the project area. Erosive forces arise from both wind and water moving across the landscape. Erosive forces associated with stormwater come both from rain that falls directly onto project areas and from overland flow that originates up-gradient and crosses project sites. Once eroded, soil would be transported down-gradient and deposited. This deposition, also known as sedimentation, may occur on a variety of locations including on another upland site, in a water body, or in an aquifer recharge feature (such as a cave or sink). Recharge features are afforded regulatory protections based on their function and context in the landscape; this is particularly true for sensitive features. Sensitive features are defined as permeable geologic or manmade features located on the Recharge Zone or Transition Zone where a potential for hydraulic interconnectedness between the surface and the Edwards Aquifer exists and rapid infiltration to the subsurface may occur (30 TAC 213).

Water quantity impacts may occur in association with construction activities. Changes in vegetation coverage, soil compaction, and soil roughness (a measure of how easily water will flow over ground) all change infiltration rates and flow dynamics. A decrease in soil roughness and an increase in soil compaction are common on construction sites where heavy machinery travels over the same areas repeatedly. Increased soil compaction can lead to decreased infiltration and, therefore, increased volumes of stormwater runoff. Increases in flow volume and velocity lead to increased flow energy which, in turn, increases water's ability to carry larger sediment loads and to scour stream channels, which further increases the overall sediment load in streams.

Caves and sensitive features may be physically changed by construction activities as well. Trenching and boring may create, uncover, or enlarge openings, changing the hydrology and atmospheric conditions of the feature. New or enlarged openings may allow for runoff to enter aquifer conduits with little to no opportunity for pollution attenuation from natural methods

such as soil percolation. Changes in exposure to the open air may also lead to changes in humidity, light, and nutrient flow within the feature, which could negatively impact any cave dependent species living there. The discovery of voids may require them to be partially or completely plugged, which could lead to their removal from the recharge matrix.

Potential impacts to aquatic resources associated with the construction and operational phases of roadways include impacts from altered hydrology and impacts from roadway associated pollution. Pollutants can enter the aquatic environment via stormwater runoff or spills, while the addition of impervious cover can affect the volume and quality of runoff. Potential impacts during each phase are discussed below, followed by a summary of mitigation commitments intended to avoid impacts.

2.2 Permanent and Operational Phase Impacts

Similar to construction impacts, potential impacts to water quality associated with the operational phase of roadways can include two broad, interrelated divisions; impacts from altered hydrology and impacts from roadway associated pollution.

Impervious surfaces can decrease infiltration rates directly by preventing access to covered areas and indirectly by increasing stormflow velocity, which can lead to increased erosion and its associated impacts. Impervious surfaces associated with roadways include the road surface itself as well as curbs, concrete swales, some types of detention ponds, and other stormwater management infrastructure. Studies have associated stormwater collection systems consisting of storm sewers and hazardous materials traps (HMTs) with decreased infiltration rates, increased runoff volumes, and increased flow velocities to and in receiving streams (Barrett, et al., 1995b).

Roadway associated pollution may be generated through highway maintenance, accidental spills, and vehicle use. Routine maintenance activities introduce pollutants such as pesticides, paint, and deicing chemicals to the roadside environment. Accidental spills that range from small leaks, to loss of fluids during crashes, to tanker truck spills can introduce pollutants as well. Vehicle use generates a number of pollutants and the processes that control the buildup of these pollutants and the processes that control their removal from the roadway have been well studied in an effort to address highway associated pollution loads in receiving waters. The processes that generate pollutants associated with vehicle use include frictional wear, leaks and spills, and fuel combustion. Frictional wear works at the point of contact between tires and the road surface causing both to lose particles to the roadside environment. Certain automotive parts such as brakes and clutches are intentionally designed to use frictional forces for their proper function. These parts are continually worn down and the materials that make them up fall from vehicles to the roadway. Other metal parts wear similarly even though they are not designed to rely on frictional forces, and these are often lubricated in an effort to reduce friction and wear. The metal particles that result from this wear along with the oil and

grease used for lubrication also fall from vehicles to the roadway. Lubricating fluids and fuels may also leak or spill to roadways, and fuel combustion byproducts may also be deposited on and near roadways through atmospheric deposition. Additionally, vehicles may pick up pollutants such as dirt or other residues and carry them to the roadway where they may be deposited. A more complete account of potential pollutants and their sources is given in **Table 2.2-1.**

Table 2.2-1: Potential Sources of Pollution in Highway Runoff

Constituent	Source
Particulates	Pavement wear, vehicles, the atmosphere, and maintenance activities
Petroleum	Spills, leaks, antifreeze, and hydraulic fluids, and asphalt surface leachate.
Nitrogen	Atmosphere and fertilizer application
Phosphorous	Atmosphere and fertilizer application
Copper	Metal plating, bearing and brushing wear, moving engine parts, brake lining wear, fungicides, and insecticides
Iron	Auto body rust, steel highway structures such as bridges and guardrails, and moving engine parts
Lead	Leaded gasoline from auto exhausts (previously) and tire wear
Zinc	Tire wear, motor oil, and grease
Cadmium	Tire wear and insecticides
Chromium	Metal plating, moving engine parts, and brake lining wear
Nickel	Diesel fuel, gasoline, lubricating oil, metal plating, bushing wear, brake lining wear, and asphalt paving
Manganese	Moving engine parts
Cyanide	Anti-caking compounds in deicing salt
Sodium, Calcium, & Chloride	Deicing salts
Sulphates	Roadway beds, fuels, and deicing salts

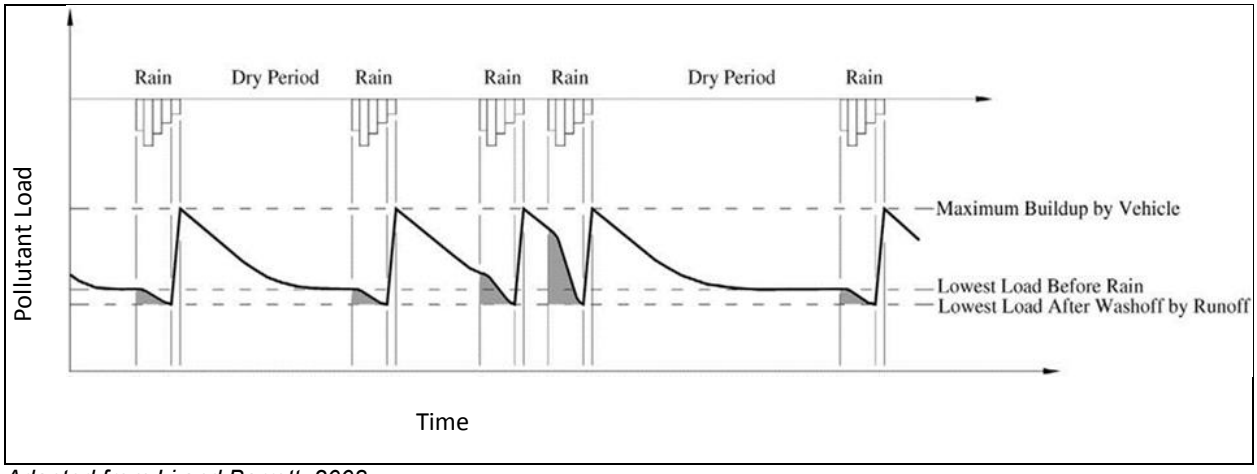
Adapted from USEPA 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. http://water.epa.gov/polwaste/nps/road_runoff.cfm Accessed 12/15/2013

Stormwater runoff is an important consideration for pollutant removal, but it is not the only contributing process. Roadside turbulence that is generated by the natural wind patterns or

from passing vehicles has a scrubbing effect on the road surface (Barrett et al., 1995b; Pal et al., 2010). Particles are blown from the surface of the road and deposited adjacent to the traffic lanes. Other substances may be removed from the roadway by volatilization, oxidation, or other chemical degradation means. Through processes like these, pollution loading tends to reach an equilibrium between rain events with dry period processes removing a portion of the pollutant load as it is being deposited (Li and Barrett, 2008).

Pollutant loading to roadways has been theorized to vary with rainfall intensity (Li and Barrett, 2008). This is partly due to the washing action that road spray has on vehicles. In times when pavement is wet enough for tires to produce spray but not wet enough to generate substantial runoff, pollutants may be washed from vehicles and left on the road to be removed by dry period processes and the next sufficient rain event. In **Figure 2.2-1** below, a conceptual diagram of pollutant buildup and removal shows that maximum removal occurs during the peak of a storm event and maximum buildup occurs as rainfall intensity diminishes.

Figure 2.2-1: Highway Pollutant Buildup and Removal Cycle



Adapted from Li and Barrett, 2008

Changes in the quality and quantity of water reaching sensitive features may result from intentional and incidental aspects of roadway operation. Sensitive features function within the context of their contributing surface watersheds. If roadways cross recharge watersheds and their design incorporates changes in topography, the watershed may be truncated and potential recharge flow may effectively be removed and lost to other processes such as evapotranspiration. Stormwater management infrastructure can impact recharge water as well. In addition to changes in erosive potential mentioned earlier, water may be conveyed into or away from the surface or subsurface catchment basins of sensitive features. Each of these can result in changes in recharge water quantity and quality if not addressed.

As described by Dr. Michael Barrett (2014), the water quality impacts that are generally associated with increased development and urbanization have been mitigated by the current regulatory framework that exists in the sensitive areas of the Edwards Aquifer. This is evidenced

by the disconnect between increasing population over the aquifer and stable water quality parameters measured by the City of Austin at Barton Springs. This is particularly true for the parameters that are typically associated with roadway pollutants (e.g. zinc and copper) including TSS, the parameter of regulatory focus. Though some parameters have shown degrading trends, these parameters are likely to be associated with water quantity issues (e.g. alkalinity, dissolved oxygen) and could not be attributed to development per se or this roadway project in particular.

2.3 Potential Impacts Summary

Understanding the issues potentially encountered during planning and construction of a roadway over sensitive environmental features (such as the Edwards Aquifer) is crucial in order to devise successful impact minimization strategies. Surface and groundwater resources associated with the proposed project may be impacted in a number of ways and because of the natural movement patterns of water, those impacts can extend far beyond the proposed project area. Due to the importance of water resources, a number of design elements and Best Management Practices (BMPs) have been developed for the SH 45SW project in order to ensure the protection of water quality and related aquatic resources. Together with alignment avoidance during the routing stage, these measures have been successfully applied to situations similar to the proposed project in order to protect sensitive resources. A summary of specific impact minimization and mitigation measures proposed to protect water quality and preserve aquatic resources in association with construction and operation of the proposed SH 45SW project are discussed in **Section 4.0** (below).

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3.0 WATER QUALITY AND AQUATIC RESOURCES-REGULATORY MEASURES

3.1 Existing Permitting Structure and Applicability

Existing regulations and programs put forth by various agencies are currently in place to promote and maintain water quality in the area. The proposed SH 45SW project would comply with all applicable state and federal regulations throughout design, construction, and operation of the SH 45SW project in order to protect both surface waters and groundwater.

3.1.1 Surface Water Regulations

The EPA's National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Clean Water Act (CWA), controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered by the TCEQ, as part of the Texas Pollutant Discharge Elimination System (TPDES). A TPDES permit may be required if wastewater is discharged into the stormwater system. The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. Construction activities that disturb five acres or more require a Construction General Permit (CGP). As part of the CGP process, a Stormwater Pollution Prevention Plan (SW3P) and a Notice of Intent (NOI) are also required. The SW3P details the BMPs that are planned for the construction site. The SW3P and the NOI would be displayed at the construction site available for review.

Section 404 of the Clean Water Act gives the USACE authority to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Impacts to waters of the U.S. could require USACE authorization. If a linear transportation project places less than 0.5 acre of fill into waters of the U.S., it would typically be authorized under Nationwide Permit (NWP) 14 for Linear Transportation projects; impacts of 0.5 acre or more require an Individual Permit. Impacts authorized under NWP 14 which equal or exceed 0.1 acre require Pre-Construction Notification (PCN) to the USACE. Impacts to wetlands (of any amount) would also require PCN. Based on design information, it is anticipated that SH 45SW would span four jurisdictional features within the state-owned ROW and that no PCN would be required.

Floodplains are lowland areas adjacent to water bodies, which are inundated during flood events. Construction within a floodplain reduces its capacity for floodwater storage and infiltration, as well as its value as habitat. Under Executive Order 11988 Floodplain Management, the Federal Emergency Management Agency (FEMA) requires municipalities that participate in the National Flood Insurance Program to adopt floodplain ordinances that prohibit development in the existing 100-year floodplain. COA is a participant in the program.

Coordination with the local floodplain administrator would be required. The proposed project would be designed to not increase the base flood elevation.

In order to meet minimum control measures (MCM) set by the TCEQ, any project with construction on a TxDOT system within a municipal separate storm sewer system (MS4) area needs to have a Notice of Intent (NOI) submitted to the proper TxDOT district (Austin District) who would submit the NOI to the proper county MS4 Operator. Part of the Phase I MS4 area that serves the City of Austin is within the study area as is the Travis County Phase II MS4. TxDOT utilizes various BMPs and programs to address these measures, as listed in **Table 3.1-1**.

Table 3.1-1: Methods to Address Minimum Control Measures Within a MS4 Area

MCM	BMP Example	Implementation Plan
MS4 Maintenance Activities	Structural Control Maintenance	Inspect structural controls at least once per year. Schedule follow-up actions as necessary.
Post-construction Stormwater Control Measures	Permanent Structure	Inspect permanent structure control.
Illicit Discharge Detection and Elimination	Update Storm Sewer Outfall Map	Map and screen all outfalls.
Pollution Prevention	Waste Handling	Ensure proper disposal of litter via collection and/or street sweeping. Ensure proper disposal of spoils via drainage ditches and structural controls.
Construction Site and Stormwater Runoff	Compliance with the Construction General Permit	Require compliance with the Construction General Permit.
Public Education/Outreach	Don't Mess with Texas program	Continue programs, which may include clean-ups, Adopt-a-Highway, etc.
Monitoring and Screening	Dry Weather/Wet Weather Monitoring	Utilization of a monitoring program.

Source: TxDOT Construction Stormwater Management Program (http://www.txdot.gov/inside-txdot/division/environmental/programs/swmp.html)

In addition to federal and state regulations, local regulations currently serve to protect water quality in the study area. The majority of the study area is within COA jurisdiction or its extraterritorial jurisdiction (ETJ). Several water quality-related regulations to consider from the City include the Save Our Springs Ordinance, the Watershed Protection Ordinance, and other measures listed in the COA's Environmental Criteria Manual (COA ECM). The COA ECM was developed by the COA Watershed Protection Department (WPD) to facilitate compliance with the city's watershed ordinances and provide water quality protection over the Edwards Aquifer Recharge Zone (Barrett et al., 1995c).

3.1.2 Groundwater Regulations

A variety of regulations are in place to protect the quality of groundwater in the Barton Springs segment of the Edwards Aquifer. Water quality at wells and in the Edwards Aquifer is protected by the Safe Drinking Water Act of 1974 and the 1996 Amendments to the Act (Public Law 104-182), laws that protect drinking water and provide source water protection. The 1996 Amendments provided new and stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection. These rules required states to delineate source water areas of public water systems and assess the susceptibility of such source waters to contamination. The source water assessment results would then be used to implement source water protection programs. TCEQ's Source Water Protection Program (SWPP) was created by the 1996 Amendments to the Safe Drinking Water Act and sets into motion a voluntary process by which local governments and suppliers of drinking water are encouraged to take proactive steps to protect local drinking water supplies before costly treatment enhancements are required. These supplies are defined primarily as water systems serving at least 15 connections or at least 25 persons at least 60 days per year.

Additionally, the TCEQ has in place the Edwards Aquifer Protection Program which provides guidelines on complying with the Edwards Aquifer Rules, as well as Optional Enhanced Measures that may be adopted to further protect water quality (TCEQ, 2013), including wells and springs fed by the aquifer and water resources to the aquifer, and upland areas draining directly to it and surface streams. The purpose of the Edwards Aquifer Rules is to protect existing and potential uses of groundwater and maintain Texas Surface Water Quality Standards (TCEQ, 2008b). The goal of the Edwards Aquifer Rules is that the existing quality of groundwater not be degraded, a goal which is consistent with the goal of groundwater policy in the state of Texas (Texas Water Code §26.401). The Texas Water Code also states that the goal of nondegradation does not mean zero-contaminant discharge. The Edwards Aquifer Rules are codified in Title 30 of the Texas Administrative Code Chapter 213 (30 TAC 213), Among the requirements of the Edwards Aquifer Rules are that any project located within the Recharge Zone would require the submittal of a Water Pollution Abatement Plan (WPAP) to the TCEQ. A WPAP for SH 45SW would be prepared and submitted for TCEQ review after construction plans are finalized. The WPAP must be approved by TCEQ prior to the initiation of construction activities.

The Barton Springs/Edwards Aquifer Conservation District (BSEACD), a groundwater conservation district with authority in the study area, regulates wells drilled within its boundaries through a permitting program, and implements water conservation measures as needed (BSEACD, 2010). They also require aquifer tests and hydrogeologic reports for new wells that would produce more than 2,000,000 gallons a year, or to any well that would increase production.

3.1.3 Other Applicable Regulations

A variety of other regulations are in place to protect aquatic resources. The Endangered Species Act (ESA) prohibits the "take" of listed species such as the Barton Springs salamander and Austin blind salamander, as do state regulations (31 TAC 65.176; Texas Parks and Wildlife Code Ch. 67 & 68).

3.2 Application of Best Management Practices (BMPs)

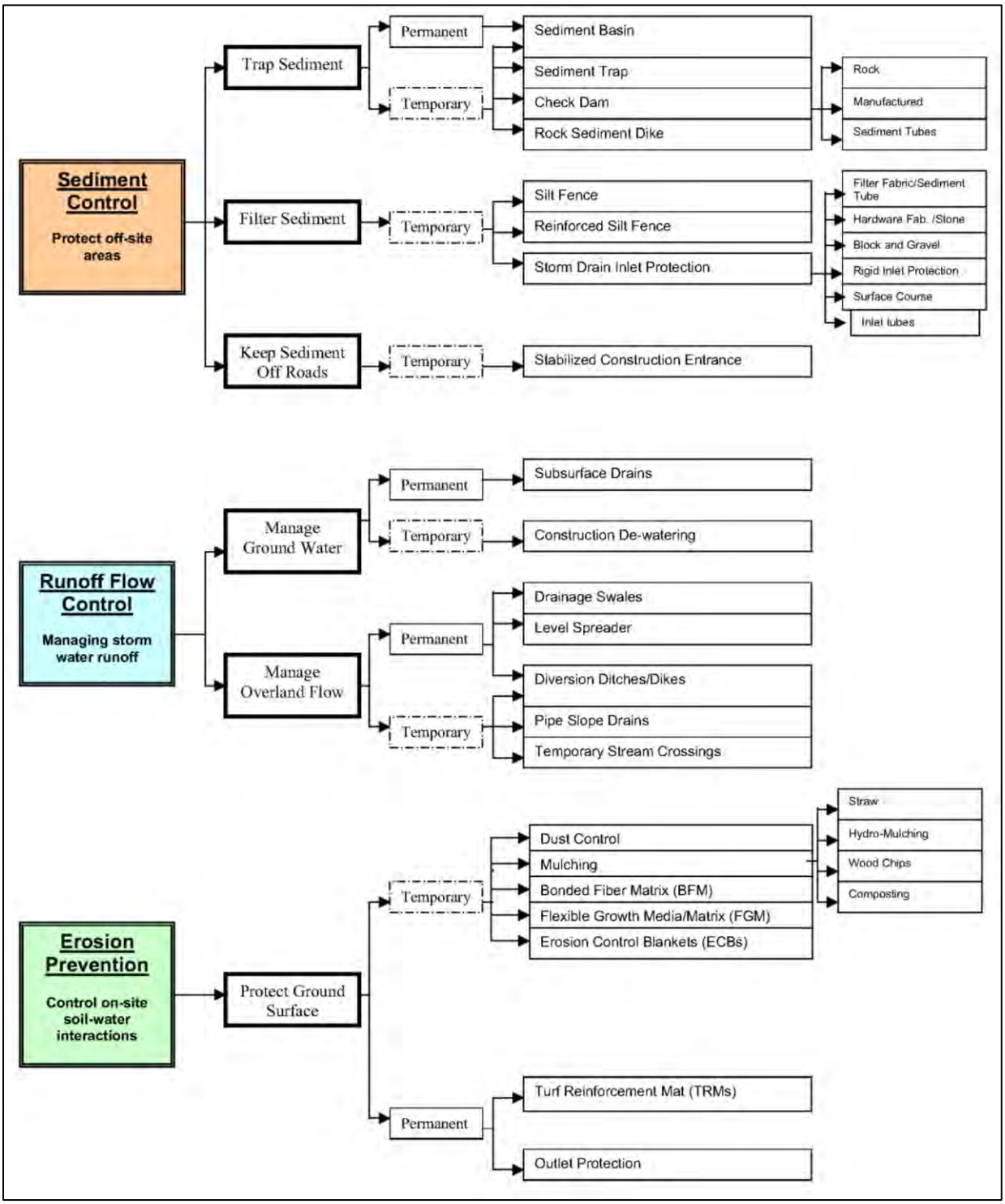
BMPs are a collection of pollution control practices established by Federal, State, and Local regulatory agencies to minimize and mitigate potential adverse effects of development on a sensitive resource or area (EPA, 2000). The primary concern during construction activities is that sediment generated by erosion caused by removal of vegetation during construction activities would adversely affect surface water and ultimately groundwater within the study area. Protection of surface and subsurface drainage areas from excessive sediments is necessary to preserve the quality and quantity of water entering the Edwards Aquifer. Sedimentation could potentially have a detrimental effect on discharge flow at Barton Springs and affect sensitive and endangered species endemic to the springs. In addition, rare troglobitic species known to inhabit Flint Ridge Cave (BCCP, 2011) could also be impacted without proper controls.

Erosion protection, sediment control, and runoff flow control BMPs would be selected using a process that evaluates unique site conditions and selects those BMPs to specifically address the need in that area (USFWS, 2007). This selection process can be performed in four steps:

1. Select the problem to control (erosion prevention, sediment control, runoff control);
2. Choose the appropriate protection strategy;
3. Decide longevity of protection (temporary or permanent); and
4. Select the specific control measure.

An example of this decision tree as utilized by the South Carolina Department of Health and Environmental Control (SCDHEC) is presented in **Figure 3.2-1**.

Figure 3.2-1: BMP Selection Flow Chart



Source: SCDHEC BMP Handbook, Appendix B (SCDHEC, 2005)

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Attachment 1 of this Technical Report summarizes protocols and design standards associated with various BMPs and outlines the findings of recent research dealing with the efficacy/effectiveness of the practice. It also evaluates various BMPs and makes recommendations regarding them being carried forward into the final design stage.

Structural BMPs can be used in series where a combination of one or more practices (or a "treatment train") is necessary to minimize the impacts of construction activities on water quality and achieve water quality goals. BMP efficiency design and calculations should:

- Be established on sound engineering principles;
- Sized on the same runoff capture volume;
- Any infiltration systems must be preceded by a sedimentation/filtration basin or approved alternative;
- BMPs in a series must be of different type unless it is demonstrated that the second of the same control type is effective;
- No additional pollutant removal beyond three controls is assumed; and
- The efficiency of the second or later control in a series shall be adjusted downward in accordance with the following: the efficiency of the second control would be reduced by 20 percent and the efficiency of the third control would be reduced by 70 percent.

The following equation (from TCEQ, 2009), while not specifically intended for temporary BMPs, can be useful in estimating construction-phase/temporary BMP efficiency:

Etot = [1 – (1-E1)(1-065E2)(1-0.25E3)] x 100

Etot = the total combined pollutant removal efficiency

E1 = the efficiency of the first control (not in percent)

E2 = the efficiency of the second control (not in percent)

E3= the efficiency of the third control (not in percent)

The efficiency of permanent BMPs installed in a series would be calculated using this equation as well. Calculations using this formula are intended to represent potential effectiveness under favorable conditions and are subject to the assumptions and specifications detailed by TCEQ (2005 and 2009).

Applicability of erosion controls would be site specific and based upon actual need on the site of the proposed project as influenced by the final proposed highway alignment and completed assessments of sensitive features. It is not anticipated that all of the BMPs listed would need to be implemented. In many cases, the use of one or more controls would be necessary in a given area to minimize erosion and capture sediments to mitigate impacts to surface and groundwater in the area.

Traditional BMPs can often be supplemented or replaced with a more sustainable approach known as low impact development (LID), designed to reduce runoff and associated pollutants by incorporating a range of both natural and constructed treatments. LID is an innovative land use and engineering design approach with the goal of maintaining and enhancing the pre-development hydrologic regime of the area. This advanced stormwater design approach works with nature to manage stormwater as close to its source as practicable using vegetation and small scale treatment systems to achieve water quality goals. Post-construction programs are most effective when they incorporate LID design during initial project planning utilizing innovative BMPs and the "treatment train" approach that protect water quality and control runoff (EPA, 2000). Examples of LID techniques are discussed further in **Attachment 1.**

Given the environmentally sensitive nature of the study area, advanced planning, preserving natural runoff conditions, pesticide/fertilizer management, landscaping and vegetative practices, public awareness and education, preservation of riparian corridors, and other types of non-structural BMPs can be effective tools at reducing potential impacts to water quality from pollution.

A number of accepted permanent structural BMPs for post-construction TSS removal are commonly used in Central Texas, such as the use of vegetative filtering and grassy roadside swales. In addition to traditional BMPs, manufactured stormwater controls can help to achieve necessary TSS removal. The applicability of a particular control is largely site- and discharge -dependent and is targeted toward specific pollutants. The advantages of pre-manufactured controls is that they have a relatively small footprint compared to conventional BMPs and can be easy to install. However, they are generally expensive and may have a problem achieving 80 percent TSS reduction (required 30 TAC 213) as a standalone method when sized to manufacturer's specifications. Data collected from a review of four vendor supplied structural BMPs classified as hydrodynamic separation systems in South Carolina indicated they were generally not successful at significantly reducing highway pollutants and enhancing stormwater runoff as stand-alone systems (Conlon and Journey, 2008).

4.0 SH 45SW WATER QUALITY AND AQUATIC RESOURCE PROTECTION COMMITMENTS

Environmental commitments included in the SH 45SW Final Environmental Impact Statement (FEIS) (including those summarized below) would be incorporated into construction plans and included as contractual requirements in any future construction contract or design-build agreement if the Build Alternative is selected. Any proposed modifications to the commitments included in the FEIS document would only be implemented after approval by TxDOT, the CTRMA, and members of the project Engineering Work Group.

4.1 Construction Phase Best Management Practices

Proper planning and project organization can influence the effects that a project would have on water quality. Environmental compliance goals must be set early and commitment to their attainment must be a part of every decision and action along the way. This begins with a commitment to carry out all appropriate and permitted resource investigations and to adhere to subsequent commitments and recommendations. The construction phase goal of erosion minimization and offsite sedimentation prevention would be attained through planning before and vigilance during construction. Non-structural and structural BMPs would be employed as appropriate to meet this goal. Additionally, to minimize impacts to water features, water quality ponds would not be constructed in floodplains. In the event of bridge installation, drill shafts would be excavated to a depth of 25 to 35, unless micro-pile designs (which utilize more shallow footings) are implemented during final design. Measures to avoid impacts to groundwater quality and aquatic salamander habitat during drilling would include: 1) all equipment refueling and overnight storage would take place outside of the 100-year floodplain; 2) drill shaft tailings within the 100-year floodplain would be removed daily in order to avoid backfilling the shaft; 3) any voids encountered would be evaluated based on established criteria as outlined in **Section 4.2.4;** and 4) steel casings would be utilized during drill shaft construction.

4.1.1 Planning, Personnel, Goals, & Organization

- A Construction General Permit would be filed with TCEQ prior to beginning construction.
    - The associated Stormwater Pollution Prevention Plan (SW3P) would detail the best BMP selection and arrangement based on final roadway alignment.
    - Inspections would be conducted as directed by the SW3P and documented using TxDOT Form 2118.
    - A Professional Geoscientist would be available to respond to void discovery incidents within four hours.
    - Project site preparation would be done in a way to minimize the amount of natural vegetation disturbed at any given time. Site clearing would be done in stages, with

minimal disturbance to natural vegetation and soils and protective fencing around vegetated areas that are to be preserved.
    - Construction boundaries, including natural buffers, would be clearly marked.
    - Appropriate erosion prevention BMPs would be applied in a timely manner as site conditions dictate to minimize the amount of time that disturbed soil is exposed.
    - Trenching and other subsurface disturbance would be avoided whenever practicable to minimize the likelihood of encountering a karst void.

- A Water Pollution Abatement Plan (WPAP) would be completed and submitted to TCEQ for review and approval. It would contain information including:
    - Geologic Assessment
        - Plans for protecting sensitive features
    - Site Plans
    - Temporary BMPs with inspection, maintenance, and record keeping
    - Permanent BMP sizing calculations
        - BMP design and construction must be certified by a Texas licensed engineer.
    - TSS removal calculations
    - Permanent BMP inspection and maintenance plan and record keeping

- An Environmental Compliance Management Plan (ECMP) would be developed during final design to include water quality-specific protection guidelines and requirements for trained personnel to ensure its success.
    - All on-site personnel, including all construction contractors, would be trained in proper environmental situation recognition and response protocols.
    - An Environmental Compliance Manager (ECM) would be on site full-time during construction to oversee construction activities and coordinate responses to environmental incidents including those related to water quality. The ECM would be a third party not employed directly by the construction firm and would not be subject to removal without TxDOT/CTRMA concurrence.
    - The ECM would have the authority to stop construction activity in response to emerging environmental situations on the proposed project site.
    - The ECM would perform or oversee water quality monitoring in Bear Creek (when water is present) before, during, and after construction activities in the Bear Creek watershed at monitoring sites which would be established both upstream and downstream from the roadway crossing area.
    - The ECM would perform or oversee inspection of BMPs to ensure proper function and would also provide adaptive management proposals to remedy perceived BMP inadequacies including the authority to add additional BMPs as necessary.

4.1.2 Up-Gradient Overland Flow Prevention

- Interceptor Dikes would be constructed along perimeters, where appropriate, to prevent up-gradient overland flow from entering the proposed project area (see **Photo 4-1.1**).
    - Dikes would be spaced to capture no more than 10 acres of runoff.
    - Stabilization (e.g. vegetation, rock) would be used when slopes exceed two percent or runoff velocities exceed six feet/second.
        - Berm compaction and dimension specifications would be followed per TCEQ (2005) guidelines.
    - Flow would be diverted to level spreaders and catchment basins for stormwater storage and sediment capture.
    - If dikes are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.
        - Sediment controls measures would not be installed within sensitive feature buffers

Photo 4.1-1: Use of rock berms and erosion control blanket within an interceptor dike

- Interceptor Swales would be constructed along perimeters, where appropriate to prevent up-gradient overland flow from entering onto the proposed project area.
    - If swales are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.

- Sediment control measures would not be installed within sensitive feature buffers.

- Swales would be spaced to capture no more than five acres of runoff.
- Stabilization (e.g. rock or flexible channel liners) would be used when slopes exceed two percent or runoff velocities exceed six feet/second. Vegetation may be used if velocities do not exceed six feet/second.
- Swales would be flat-bottomed with side slopes of 3:1 or flatter.
- Other swale specifications would be followed per TCEQ (2005) guidelines.
- All specifications could be changed or refined based on detailed design.

4.1.3 Slope Stabilization

- Permanent vegetation would be planted within 14 days of attainment of final slope.
  - Mulch would be applied when seeding occurs on critical sites or when soil or seasonal conditions are sub-optimal. Trees removed for roadway construction would be chipped on-site and applied to bare ground to a depth of four to six inches.
  - Mulch applied to slopes greater than 15 percent would contain a binding agent.
  - Seeded Erosion Control Blankets (see **Photo 4.1-1**) may be used on slopes greater than 15 percent.
  - Seeded erosion control treatments can be applied through hydromulch, as shown in **Photo 4.1-2**.
  - Cleared areas would be revegetated or mulched within 14 days of the completion of work in that area or if work would not occur in that area within the next 21 days.

Photo 4.1-2: Example of hydromulching and mulch logs on Austin construction site

  - Silt fences, rock berms, and other flow control BMPs would be placed such that no one BMP receives excessive amounts of runoff. See **Photos 4.1-1** and **4.1-3**.

- Silt Fence: less than 0.25 acre per 100 feet of fence only on slopes less than 20 percent
- Triangular Filter Dike: less than one acre only on slopes less than 10 percent
- High Service Rock Berm: less than two acres only on slopes less than 30 percent, may be used to protect sensitive features.

- Stormwater catchment basins would be constructed to promote precipitation of suspended solids and infiltration of stormwater on-site.
  - Stormwater would be harvested and used for irrigation and dust suppression when possible.

Photo 4.1-3: Use of silt fencing on a construction site

4.1.4 On-Site Sediment Retention

- On-site stormwater would be detained in catchment basins to promote sediment deposition or water infiltration. Permanent water quality ponds would be built as early as practicable and incorporated in the construction phase approach. Further discussion of the proposed ponds is provided in **Section 4.3.1** below.
  - The water quality ponds would be constructed first in the Sequence of Construction (SOC) to act as a sedimentation pond during construction. This includes construction and maintenance of temporary or permanent drainage conveyance measures for the disturbed site runoff to reach the pond. A de-watering method/plan for the pond would be prepared if the temporary sedimentation pond is to be de-watered after rainfall events in order to minimize the discharge of suspended sediments in the ponded water into receiving waters to the greatest extent feasible.

- Basins would be sized to accommodate up to four inches of rainfall from a single rainfall event.
- Basins would not be placed in sensitive feature buffers.
- Basins would be clearly marked with safety fencing during construction.

- Stabilized Construction Exits would be installed at site access points to promote the removal of site sediment from vehicles.
  - The stabilized pad would be flush with the surface of the receiving road.
  - The receiving road should be swept daily to contain sediment.
  - If pad is to be washed, rinsate must be collected in a catchment basin.
- Silt Fences and/or mulch logs would be installed around site perimeter and interior buffers (e.g. karst buffers) where dikes or other flow deflectors are not installed.
  - Fences must be properly trenched in, and staked per TxDOT guidelines
  - Fences should be inspected with other site BMPs and deficiencies should be corrected as soon as possible.
- All storm sewer inlets along public streets down gradient from site entrances would be protected as needed.

4.1.5 Spill and Hazardous Materials Management

- Hazardous materials brought onto the state-owned right-of-way would be properly stored and labeled with Safety Data Sheets (SDS) readily available.
- Secondary containment would be required for all hazardous material storage sites.
- Hazardous Materials Spill Protocols would be made available to all appropriate personnel as part of site education program.
- Gasoline or diesel spills (on land surfaces) of 25 gallons or more or other hazardous materials spills of reportable quantities would be reported to TCEQ.
- All gasoline, diesel, and other hazardous materials spills into surface waters would be reported to TCEQ.
- In the event of an accidental spill of hazardous materials, TxDOT would work with other agencies and its contractors to secure the scene and implement appropriate spill response measures. Standard spill response procedures are outlined in various manuals and guidance documents:

  - Occupational Safety Manual, Chapter 4: Hazardous Materials (revised 2014)
  - Maintenance Management Manual, Chapter 7, Section 4 - Oil and Hazardous Material Spills (revised 2014)
  - Maintenance Operations Manual, Chapter 5, Section: Emergency Spill Response (revised 2010)
  - Guidance for Environmental Compliance at TxDOT Facilities, Small Spill Response (revised 2004) page 28, and Abandoned Hazardous Materials, page 30

4.1.6 Good Housekeeping Best Management Practices

- Vehicle Fueling
  - Fuel would be stored outside of the 100-year floodplain and outside the surface catchment areas of any sensitive features.
  - Fueling would be done in a designated area on an impermeable pad within a confining berm.
  - Absorbent pads or drip pans would be used at refueling sites.
  - Absorbent materials would be readily available for spill cleanup.
  - "Topping-off" fuel tanks would not be permitted.
- Equipment Washing
  - Equipment would be washed before it is employed on the jobsite.
  - Equipment washing would not be allowed on the jobsite.
- Dust Control
  - Dust induced by wind and construction site activities would be suppressed through the use of erosion control matting where practicable and through wetting in other disturbed areas.
    - Rainwater (i.e. stormwater) rather than chlorinated water should be collected and used when practicable.
- Litter Control
  - Lidded dumpster(s) would be maintained on-site and pickup would be scheduled prior to the dumpster reaching capacity.
  - Litter should be contained continuously and weekly litter pick-up should occur to prevent its migration to streams or sensitive features.

4.2 Temporary and Permanent BMPs to Address Potential Impacts to Flint Ridge Cave and Other Sensitive Features

Previously completed karst surveys have identified a number of features with various types of surface openings within and near the state-owned ROW which encompasses the proposed project. Additional investigations have further assessed these karst features with regard to their ability to serve as recharge features or as habitat for rare or protected species. These investigations were used to develop the currently proposed alignment. Surface expressions of karst features including their surface openings, the depression around the opening, and the void's catchment basin have been evaluated. Measures have been taken during the design phase to protect void function (including re-alignment of the proposed roadway), and further protective measures would be incorporated during the final design process. More detailed information on sensitive feature protective measures is available below and in **Attachment 3**.

The SH 45SW state-owned ROW intersects a portion of the surface catchment basin for Flint Ridge Cave, a major cave and significant recharge feature that has its surface opening located on a COA WQPL tract adjacent to the state-owned ROW (**Photo 4.2-1**). The surface catchment for Flint Ridge Cave was delineated using TxDOT aerial survey for areas inside the state-owned ROW and LIDAR data for portions outside of the ROW. The watershed divide was first established at the obvious high ridge located on the southeast side of the cave. The delineation then followed the natural high ridge around the south side of the cave. Then both the west and east delineation lines followed a northerly to northwesterly path, normal to the contours, until the two paths converged at the most upstream point of the watershed encompassing what is considered in this report as the Flint Ridge Cave watershed (drainage area).

The state-owned ROW passes within ~150 feet of the cave entrance (Hauwert et al, 2010). Previous estimates of the cave's surface catchment basin have ranged from approximately 40 acres to approximately 69 acres. Recent karst investigations have yielded estimates of 43.7 and 55.5 acres. By combining digital data with one-foot contour intervals and field reconnaissance, the SH 45SW team has delineated an approximately 55.5-acre catchment basin that they feel best represents true conditions. The SH 45SW DEIS alignment was modified based on the results of detailed karst investigations in order to minimize impacts to Flint Ridge Cave, including a realignment which moved the roadway outside of the 345-foot cave cricket foraging radius from the cave mouth. Based on current design, the proposed project would result in approximately 0.7 acre of the surface catchment basin being covered by impervious surfaces (compared to 5.6 acres under the previous design). Measures intended to avoid harm to Flint Ridge Cave include the following:

- In order to preserve the quantity of recharge water reaching the cave, the design would include rerouting approximately 0.7 acre of surface runoff from an adjacent area into the catchment basin of Flint Ridge Cave (see **Figure 4.2-1**).
- In order to protect the water quality of surface recharge entering the cave, roadside traffic barriers and stormwater conduits would convey the roadway's runoff away from the cave's catchment basin and into a nearby water quality pond where it would be treated before being released into Bear Creek. No roadway runoff would flow into the Flint Ridge Cave surface drainage. See **Figure 4.2-1**.
- Routine inspection and maintenance would be carried out on all protective features following construction.
- Potential hazardous material spills would be conveyed outside of the Flint Ridge Cave surface drainage basin and captured in water quality ponds/hazardous material traps.

- A report titled "Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas" provides a detailed assessment of impacts to Flint Ridge Cave and is included in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (2014b).

Photo 4.2-1: Entrance to Flint Ridge Cave

The cave is currently gated, and bi-annual cave faunal surveys and cricket counts are being conducted. In addition, the COA WPD monitors stormwater catchment in the area (BCCP, 2011), and is currently (December 2014) conducting a drip test in order to determine surface infiltration's contribution to the cave's recharge. A Geologic Assessment has been performed within the state-owned ROW in accordance with TCEQ guidelines (TCEQ, 2004) to identify and assess other potential sensitive features within the SH 45SW footprint. Impacts to the surface drainage basins of other sensitive features are described in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (2014b).

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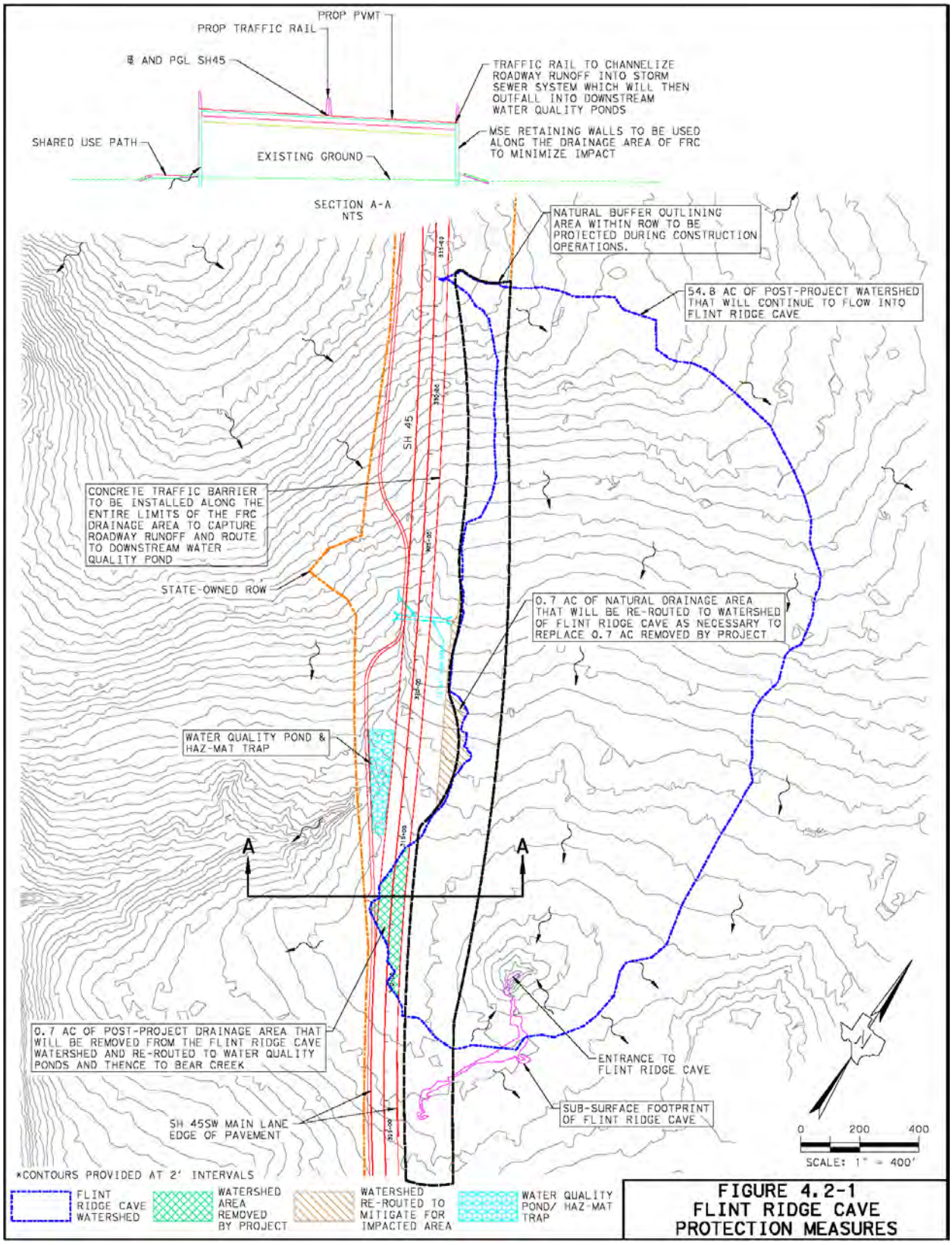
Figure 4.2-1: Flint Ridge Cave Protection Measures



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Two sensitive features that have surface openings and portions of their surface catchment basins located in the state-owned ROW would be impacted by the proposed alignment. Additional specific measures have been incorporated into the current project design to minimize impacts to these sensitive features and to mitigate impacts that were found to be practically unavoidable. Feature #55 and Feature #23 (a.k.a. Hat Sink), two sensitive features identified in the **Geologic Assessment** would each have portions of their surface catchment basins removed; however, current design would not require either of these features to be filled. Efforts made to protect the function of each feature and its catchment basin are described below. Additional information on these and other sensitive features is available in **Attachment 3**.

Based on current design information, Feature#55, a sensitive feature located within a minor drainage channel, would be covered by roadway construction. The current alignment resulted from efforts to protect the integrity of Flint Ridge Cave. Approximately 2.24 acres of the 16.26-acre drainage area of Feature #55 would be impacted. Compensatory surface flow would be diverted by vegetated diversion dikes and the raised road bed from adjacent areas into the surface catchment basin of Feature #55. Because the surface expression of this feature occurs directly beneath the roadway's proposed alignment, and because the feature occurs in a drainage channel, the roadway design has been modified to include a bottomless culvert that would span the feature and the drainage channel that it occurs in. Stormwater from the roadway would not be allowed to comingle with surface flow from the catchment basin. Stormwater would be collected via traffic rails and conveyed conduits to a water quality pond for treatment before its eventual release to Bear Creek. See **Figure 4.2-2** and **Attachment 3** for additional details.

Approximately 0.13 acre of the 1.194-acre surface drainage basin of Hat Sink (Feature #23) would be intersected by the proposed roadway. A vegetated diversion dike would allow surface flow to be captured on an adjacent, equivalently sized area to compensate for the lost catchment. Surface flow would be conveyed under the roadway via culverts, and natural buffers would be established surrounding the openings to both the feature and the culvert. Stormwater from the roadway would not be allowed to comingle with surface flow from the catchment basin. Stormwater would be collected via traffic rails and conveyed conduits to a water quality pond for treatment before its eventual release to Slaughter Creek. See **Figure 4.2-3** and **Attachment 3** for additional details.

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Figure 4.2-2: Feature #55 Protection Measures

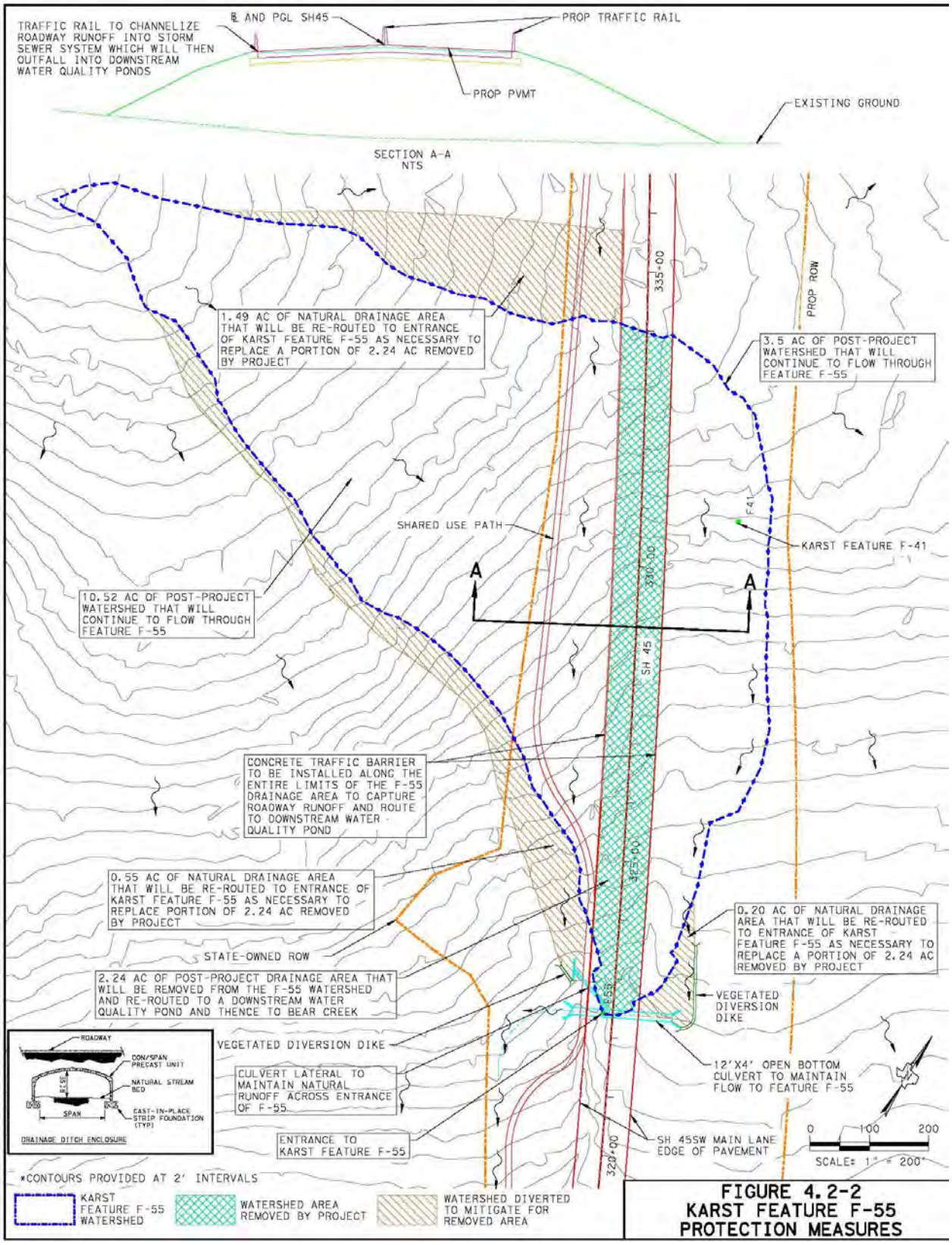

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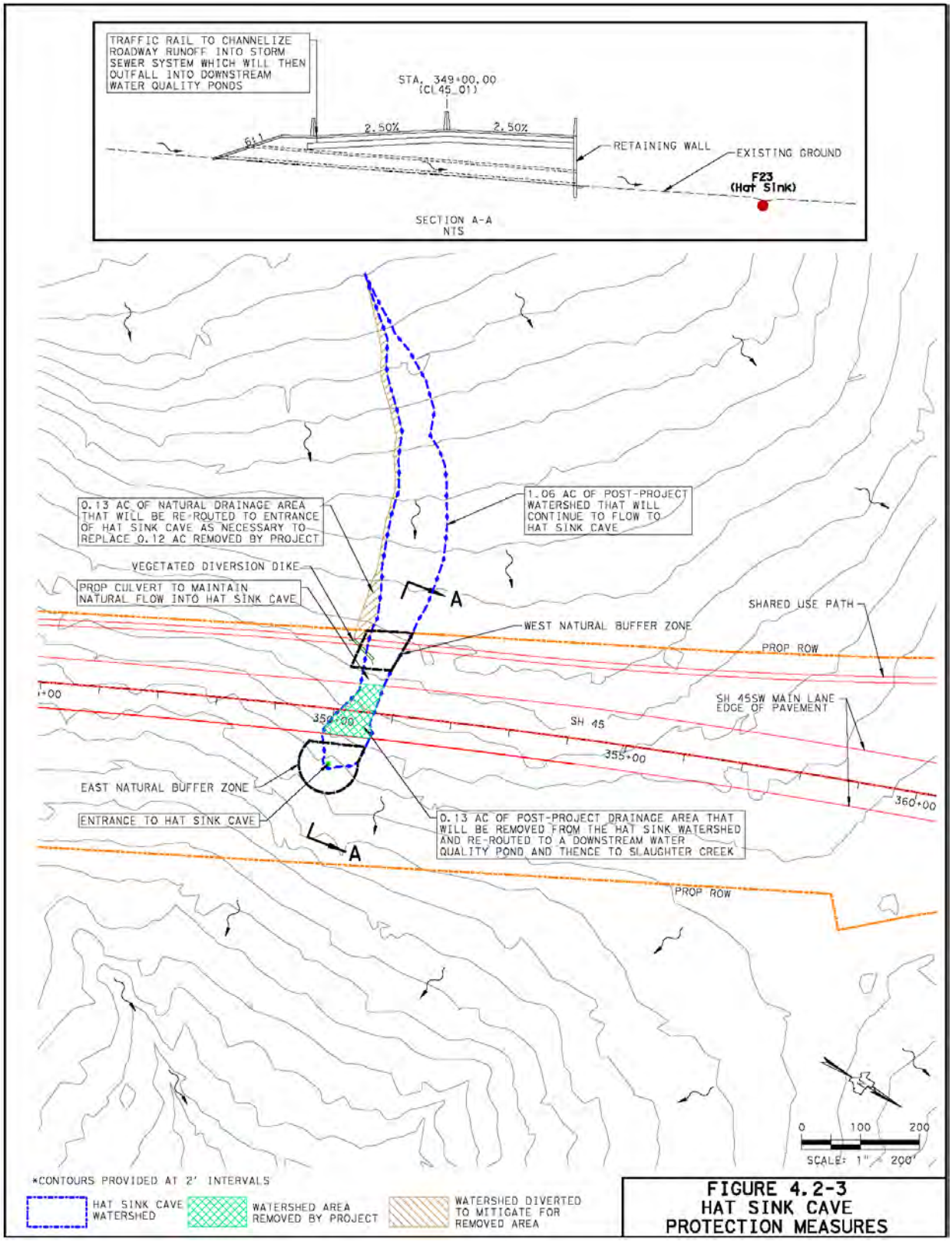
Figure 4.2-3: Feature #23 (Hat Sink) Protection Measures



Source: RTG, 2014

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BMPs designed to protect cave openings range from metal gates which maintain airflow and access by small animals but restrict passage of large materials and debris, to vault openings specifically designed for cave entrances located in drainage features. These vaults can be fitted with valves designed to open and close to control the flow of water into the cave. During storm events, the valves can be closed to prevent clogging of the cave with storm debris and sediment. When the water quality improves, the valve can be opened to allow recharge. Use of a vault to protect a cave entrance located in Onion Creek has been successful in screening sediments and protecting water quality (Smith et al., 2011). Specific protection to cave entrances should take into account that cave access is needed for certain cave dwelling animals that may be nocturnal foragers as well as small mammals and that recharge and airflow need to be preserved while protecting the entrance from sediment and pollution (TCEQ, 2005) (see **Photo 4.2-2**). Sensitive features would be taken into account during the final design phase of the proposed project.

Sensitive feature surface catchment basins have been determined by a qualified geologist working in concert with project engineers. Final void protection measures would be developed during the final design/plans, specifications and estimates (PS&E) phase based on information obtained by the geological assessment. Protective measures including temporary and permanent BMPs would be evaluated based on the specific feature and the location of that feature with respect to construction activities and may include:

- Pre-Construction Planning to Avoid Harm to Known Sensitive Features (such as the aforementioned re-alignment to reduce impacts to the Flint Ridge Cave surface drainage);
- Construction Phase Sensitive Feature Protection Measures;
- Void Discovery Protocols; and
- Void Mitigation

Photo 4.2-2: Example of a protective grate on a karst feature

Source: (TCEQ, 2007a)

4.2.1 Pre-Construction Planning to Avoid Harm to Sensitive Features

Advance investigation in the form of a Geological Assessment per TCEQ (2004) specifications and advance planning allow for the identification and protection of sensitive features.

- As previously discussed, the highway alignment depicted in the DEIS has been modified to minimize impacts on sensitive features where practicable to preserve natural conditions.
- If features or their catchments cannot be avoided, the area may be bridged, or spanned using a bottomless culvert. If a bridge option is implemented, cave entrances must be protected as outlined below.

- Bridges would have stormwater conveyance infrastructure (e.g. curbs and gutters) to direct stormwater beyond the surface catchment of the sensitive feature.
- HMTs could be constructed adjacent to the feature to minimize the likelihood of contamination through a large, accidental spill.

4.2.2 Construction Phase Sensitive Feature Protection Measures

Sensitive features, such as caves and sinkholes identified during the Geologic Assessment would be preserved and protected during construction through the following measures:

- Natural buffers would be established that extend a minimum of 50 feet in all directions from the basin surrounding the opening where practicable, and may extend further based on drainage area..
  - Vegetation in its natural state, typically a combination of dense native grasses and forbs within a mosaic of shrubs and trees, would be preserved where practicable.
  - Construction would be avoided to the maximum extent practicable in the sensitive feature buffer.
  - Pesticides and fertilizer would not be applied in the buffer.
  - No stormwater conveyance systems would be constructed such that their outfall occurs within the feature's buffer unless they will convey runoff from undeveloped areas to maintain runoff.
  - Temporary runoff protection would be erected around the perimeter of the buffer.
    - This may include high service rock berms, biodegradable erosion control logs, and silt fences as appropriate.
- Sensitive Features would have buffers established around them during the Construction Phase. Appropriate measures listed in TCEQ's *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that may be Habitat for Karst Dwelling Invertebrates* (TCEQ, 2007b) would be utilized where feasible, to include:
  - The buffer area would be fenced per TCEQ (optional enhanced measures) with orange construction fencing.
  - Storage, maintenance, or use of motorized vehicles within the buffer would be prohibited.
  - Buffer Zone Maintenance Plan would be submitted in conjunction with the WPAP.
    - A Monitoring Plan would be implemented.
    - A Spill Management Plan would be implemented.
- Caves within the state-owned ROW would be gated (see **Photo 4.2-2**)

  - Gates would not impede the natural passage of air, water, and organic material.
  - Gates would allow passage of cave dependent species.
  - Gate construction would follow Section 2.3.1 TCEQ (2007a) for proper fit, natural and maintenance access, and protection.

Where protection of the feature is not an option, for example where alternate alignments or configurations are not practicable and the alignment goes over a feature, such features would be evaluated for closure or mitigation. These determinations would be made during the final design phase of the proposed project.

4.2.3 Void Discovery Protocol

- A void may be indicated by a subterranean opening that displays any of the following characteristics:
  - An opening larger than six inches in any direction.
  - At least one square foot in total area.
  - Blows air.
  - Consistently receives water during any rain event.
- If a void is discovered during grading, trenching, tree removal, drill shaft construction, or any other construction activity the following protocol would be followed:
  - All activity within a 50-foot radius of the void would immediately stop.
  - Notify the ECM.
  - Cover the void to prevent contamination and changes in ambient conditions (tarps or similar materials are appropriate as available).
    - The ECM should immediately notify the Construction Project Manager
    - The Project Manager should immediately notify the TCEQ Regional Office and BSEACD personnel, if required by WPAP conditions.
    - The Project Manager would provide for the evaluation of the feature by a geoscientist licensed by the Texas Board of Professional Geoscientists or by a Professional Engineer who qualifies to practice geoscience according to the Texas Board of Professional Geoscientists.
  - Work should cease in the area until an assessment of the void can be completed.
  - Temporary protections should remain in place until final mitigation and protection measures are approved by TCEQ and in place.

4.2.4 Void Mitigation & Protection Measures

Trenching may be required in certain isolated situations. For instance, trenching would be expected in conjunction with the project intersection with Bliss Spillar Road and may also be required in other isolated locations for culvert, storm sewer or water quality pond installations. Voids encountered during construction would be inspected by a qualified geologist (30 TAC 213

§ A(14)), and the following protocols would be used to protect the void and the Edwards Aquifer from potentially adverse impacts to water quality.

- In the case of small (less than one cubic foot), dry voids with no biological activity, the void should be covered by either (1) filter fabric with a three foot overlap or (2) plywood planking weighted in place with rock or block weighing no less than five pounds in order to prevent backfill material from entering the void.

- Larger dry voids with no biological activity should be hand filled with rock (three to five inches), covered with filter fabric, covered with low slump concrete (18 inch minimum thickness), then covered with backfill.

- In cases of voids with water flow, flow would be maintained to the greatest extent practicable, the walls would be stabilized if necessary with planks or sandbags, concrete would be poured over the pipe, sealing the void. Protocols for voids with biological activity would be negotiated with the TCEQ.

4.3 SH 45SW Best Management Practices During Operational and Maintenance Phase

Post construction TSS removal would be addressed through the use of several structural and non-structural BMPs. Where conditions allow, BMPs would be used in a series with each in the line removing additional TSS and other pollutants. TSS removal rates through these BMPs in series can conceptually approach 100 percent. Removal for SH 45SW would total at least 90 percent of post-construction TSS associated with the addition of impervious cover over the Edwards Aquifer Recharge Zone. For BMP definitions, conceptual layouts, research findings regarding removal efficiencies, and combined removal efficiency calculations, see **Attachment 1**.

4.3.1 Structural BMPs

Based on current design, for the overall proposed project there are 23.35 acres of existing impervious cover and after construction there would be 74.98 acres of impervious cover (including the shared use path (SUP) as impervious) for an increase of 51.63 acres. Within the Recharge Zone, there are 17.67 acres of existing impervious cover and after construction there would be 65.81 acres of impervious cover including the SUP as impervious for a difference of 48.14 acres. Utilizing a combination of the following BMPs, at least 90 percent of the incremental increase in post-construction TSS attributed to the project would be removed over the Recharge Zone.

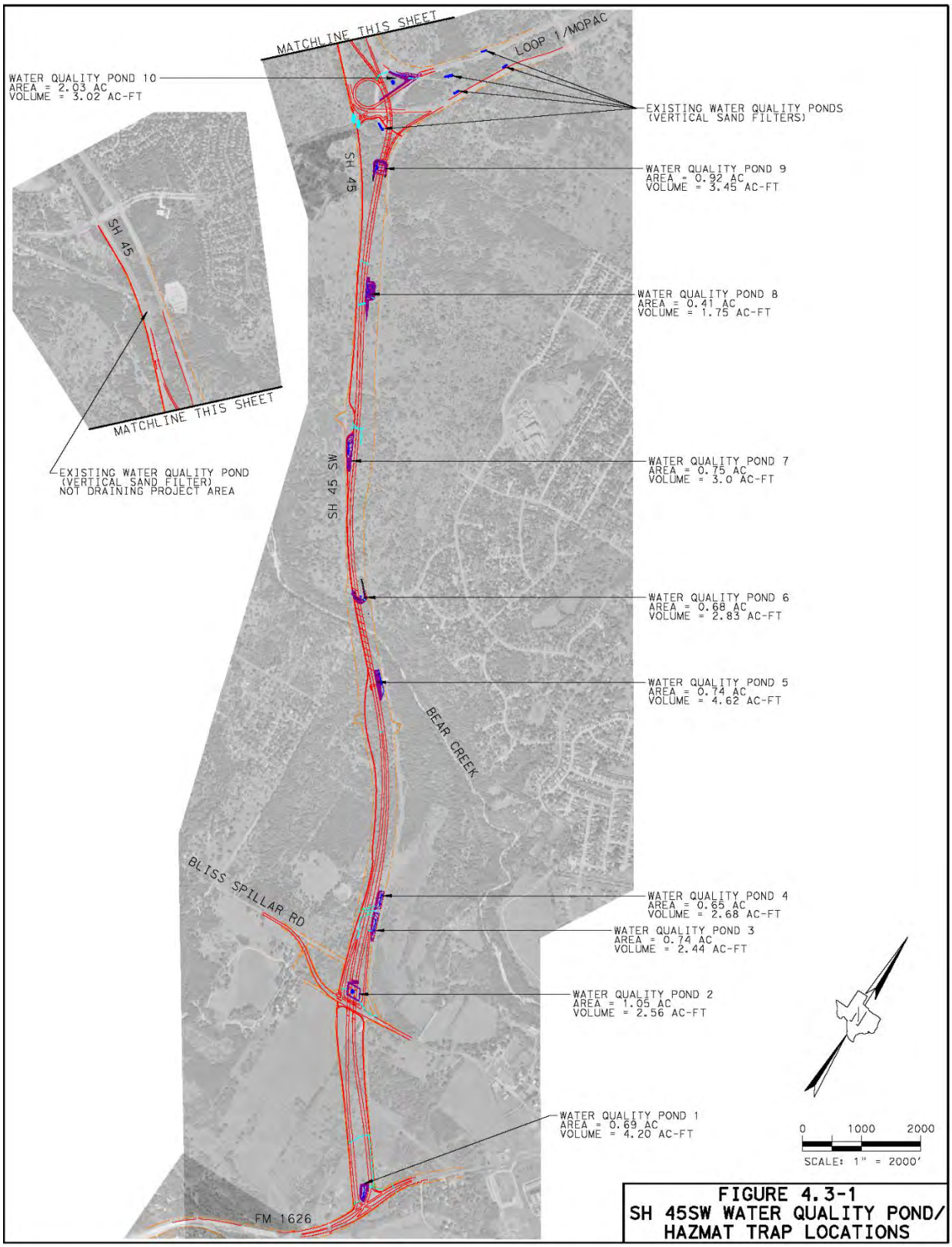
- Permeable Friction Course (PFC) Pavement

- PFC would be applied to the majority of SH 45SW road surfaces (exceptions being the bridge structures and the SUP).
- PFC has been shown to reduce up to 96 percent of TSS loads and 90 percent of heavy metal loads in stormwater runoff.

- Vegetative Measures
  - Grassy Swales
    - Promote infiltration and reduce stormwater volume and velocity.
    - 70 percent TSS reduction.
  - Vegetative Filter Strips (VFS)
    - Promote infiltration and reduce stormwater volume and velocity.
    - 85 percent TSS reduction.
    - Vegetative filter strips would be utilized in areas where curbs and other stormwater conveyance infrastructure is not required.
- Water Quality Ponds

  For the majority of the SH 45SW roadway PFC and water quality ponds are currently proposed for a minimum of two levels of treatment. Water quality ponds are designed to allow sediment to settle out of runoff and also to capture any potential hazardous material spills (see **Figure 4.3-1**). Ponds would be sized to accommodate up to four inches of rain from a single rainfall event. All SH 45SW roadway runoff would flow through a pond except for small areas at the intersections where it would not be possible to establish grades that would drain surface flow to ponds. The areas at MoPac, however, would flow into existing sand-filtration ponds. In these areas, PFC would be used as one form of treatment. In most areas, an additional VFS and/or grassy swale would provide a third level of treatment. In areas where PFC is not appropriate (e.g. bridges and similar super-structure) stormwater would be drained through a collection system into water quality ponds for treatment--all runoff from bridge decking would be captured and treated.
- Hazardous Materials Traps
  - Would be included in the function of the 10 proposed new water quality ponds.
  - Would meet or exceed spill detention requirements. All of the ponds would capture substantially more than the traditional 10,000 gallon hazmat trap volume.
  - Are included in the six existing ponds (vertical sand filters) near the existing MoPac and SH 45 facilities (one of which does not drain the project area).

Figure 4.3-1: SH 45SW Water Quality Pond/Hazardous Material Trap Proposed Locations



Source: RTG, 2014

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4.3.2 Non-Structural BMPs

- Native/Xerophytic Vegetation Propagation
  - Vegetation coverage is essential to proper functioning of vegetative buffers. Vegetation that requires less fertilizer and irrigation, and therefore maintenance, would be promoted in vegetative buffer areas.
- Pesticide Management
  - Integrated Pest Management (IPM) practices (with the exception of pesticide application, which would be prohibited within the state-owned ROW) would be employed along the state-owned ROW to control pest populations.
- Mowing Schedule
  - Mowing would be delayed during times when preferred vegetation is seeding to allow for natural propagation to continue.
- Street Sweeping
  - Street sweeping/vacuum truck utilization has been shown to significantly reduce TSS loads in highway runoff, especially when done following an event that is known to deposit a large amount of sediment on the roadway or after a storm event.

4.4 Inspections, Maintenance and Testing

- Periodic BMP inspections would take place during construction and operation of the proposed facility.
  - Initial testing and certification of permanent BMPs would ensure that they function as intended. Testing of PFC pavement is described in the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (2014b).
  - Ongoing inspection, maintenance and testing of permanent BMPs would be carried out *in a manner designed to meet or exceed TCEQ requirements* over the life of the project in order to ensure that the intended protection is realized. Improperly functioning BMPs would be repaired or retrofitted to restore their intended function as needed.

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5.0 IMPACTS TO AQUATIC RESOURCES RESULTING FROM CONSTRUCTION OF SH 45SW

5.1 Water Quality Impacts

The potential impacts to water quality and aquatic resources that may result from construction and operation of the proposed project have been quantified based on the use of specific BMPs which are proposed to avoid, reduce, or compensate for these impacts. Utilizing the proposed approach, construction phase contamination would be prevented by adherence to environmental commitments, while post-construction TSS levels in treated stormwater would be lower than "background" loads of stormwater runoff from areas similar to the state-owned ROW (the No Build). While TSS is a principal concern during both construction and operation of roadways, the BMPs that are part of this proposed project would address other roadway-associated pollutants such as heavy metals, nutrients, and hydrocarbons.

Construction Phase Water Quality Impacts

The proposed aquatic resource protection measures described in this technical report would, if fully implemented, result in negligible impacts to surface and groundwater quality during construction. Staged construction, limited soil disturbance, and the preservation of natural vegetation would minimize erosion and decrease the likelihood of sediment discharges. In addition to the six existing vertical sand filter ponds (one of which does not drain the project area), ten water quality ponds/hazardous material traps are proposed to be built for the treatment of stormwater throughout the SH 45SW corridor. These permanent BMPs would be installed as early as practicable during the construction phase of the proposed project to allow for the temporary detention and treatment of on-site stormwater. Ponds similar in design to those proposed have been shown to reduce TSS levels by 91 percent (Middleton et al., 2006). To further protect against sediment discharge, sediment control BMPs such as rock berms and erosion control logs would also be installed, as appropriate. Standard rock berms have been shown to retain approximately 70 (FDEP, 2013) to 95 percent of TSS loads (EPA, 2014). Erosion control logs have demonstrated a 95 percent TSS removal rate (COA, 2012). Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable. Utilization of a full-time ECM would ensure strict adherence to environmental commitments and provide direction regarding continual improvement. The proposed approach has been used successfully on other recent local projects in environmentally sensitive areas (such as the construction of the City of Austin Water Treatment Plant #4, SH 130, and 183A) in an effort to ensure non-degradation of water quality.

Water Quality Impacts Associated with Roadway Operation and Maintenance

During the operation of the proposed roadway, multiple levels of treatment of stormwater runoff would be in place. As is discussed in detail below, the proposed system of stormwater treatment would remove at least 90 percent of the incremental increase in TSS load associated with the proposed project. PFC pavement and water quality ponds are currently proposed for a minimum of two levels of treatment. In most areas, additional VFS and/or grassy swales would provide a third level of treatment for a substantial portion of the corridor. In areas where PFC pavement is not appropriate (e.g. bridges and direct connectors) stormwater would be drained through a collection system into water quality ponds for treatment. Several of these key permanent BMPs are presented below in **Table 5.1-1** along with their removal efficiencies related to TSS as well as other highway-associated pollutants. The efficiencies noted represent the potential removal rates of these BMPs in a stand-alone situation and variation in efficiencies may be found between studies. For example, Sampson et al. (2013) reported TSS removal rates for PFC equaled 92 percent.

Table 5.1-1: Published Data Regarding Pollutant Removal Efficiencies of Water Quality Protection Measures

Pollutant	PFC Pavement Removal (%)[1]	Water Quality Ponds Removal (%)[5]	Vegetative Filter Strip (VFS) Removal (%)[2]	Grassy Swale Removal (%)[3]
TSS	92	91	85	74
Volatile Suspended Solids	n/a	92	n/a	72
Turbidity	n/a	n/a	78	n/a
BOD_5	n/a	30	n/a	46
Chemical Oxygen Demand	7	53	63	35
Total Carbon	n/a	n/a	53[4]	48
Dissolved Total Carbon	n/a	n/a	n/a	9
Nitrite and Nitrate	8	-75[6]	23	59
Total Phosphorus	51	61	34	31
Oil & Grease	n/a	n/a	n/a	88
Copper	51	42	n/a	49
Iron	n/a	n/a	75	79
Lead	91	82	17	35
Zinc	81	74	75	74

[1] *Stanard, Barrett, and Charbeneau (2008); comparison of conventional asphalt and PFC pavement at Site 1*
[2] *Walsh et al. (1997); Walnut Creek site*
[3] *Barrett et al. (1995b)*
[4] *Total Organic Carbon*
[5] *Barrett (2010); study evaluated sand filter systems, a type of water quality pond*
[6] *The increase in nitrite and nitrate concentration observed for sand filter water quality ponds was attributed to chemical processes that turn organic nitrogen and ammonia into nitrite and nitrate during the dry period between storm events and to a pronounced first flush effect in sand filter discharge due to build up on nitrate and nitrite (Barrett, 2010). This premise is supported by the fact that the study found a decrease in concentration of total Kjeldahl nitrogen, a measure of the sum of organic nitrogen, ammonia, and ammonium.*

As previously mentioned, most stormwater would be treated by a series of BMPs thus increasing the potential pollutant removal rates. Based on TSS removal efficiencies accepted by TCEQ and efficiency calculations for BMPs in series, select BMP efficiencies in stand-alone applications and in series are presented in **Table 5.1-2**.

Table 5.1-2: TCEQ Accepted Removal Efficiencies

	Stand-alone					In Series	
	PFC	**Water Quality Ponds (Sand Filter Systems)**	**VFS**	**Batch Detention Ponds**	**Grassy Swales**	**PFC & VFS**	**PFC & Ponds**
TCEQ Accepted TSS Removal Efficiencies (%)	90	89	85	91	70	96	96

Source: TCEQ 2005, 2009, 2012

With existing BMPs in place, there are currently 18,182 pounds of TSS generated per year within the state-owned ROW. Of that total, 11,620 pounds per year are generated over the Recharge Zone (see **Table 5.1-3**). If the proposed project were implemented, approximately 86,865 pounds TSS load would be generated within the state-owned ROW each year before treatment. Of that amount, approximately 56,233 pounds per year would be associated with the impervious cover added by the project, this is the project's total incremental increase in TSS load. The Edwards Aquifer Rules (30 TAC 213) require the treatment of stormwater runoff from projects over the Edwards Aquifer Recharge Zone such that 80 percent of the incremental increase in TSS load generated is removed before the water is released. Through the proposed configuration and BMPs, 60,339 pounds of TSS would be removed from stormwater in the state-owned ROW. Because this would include removal of a portion of the existing load, the treatment scenario proposed by TxDOT would exceed the 80 percent removal required by the Edwards Aquifer Rules and remove a load equal to 107.3 percent of the incremental increase. This would essentially result in an improvement over the existing condition whereby the annual TSS load generated over the Recharge Zone is reduced by 21.7 percent from an existing level of 11,620 pounds per year to approximately 9,096 pounds of TSS per year after construction. Although stormwater treatment is not required over the Transition Zone (30 TAC 213), current design proposals would include stormwater treatment in these areas as well. Treatment of stormwater runoff would thus allow for a net decrease of 4,107 pounds per year in annual TSS loading within the state-owned ROW (an improvement over the No Build). Based on the net load of TSS that would be generated over the Recharge Zone and rainfall data for the area (65.8 acres [existing plus proposed impervious cover] over the Recharge Zone and a 32 inch/year average rainfall), [(9,096 lbs TSS/yr) / (175.5 acre-feet of rainfall / year)], average TSS concentrations of treated stormwater runoff from areas of the proposed project over the Recharge Zone would average approximately 19.1 milligrams/liter (mg/L) (1 lb/acre-foot equals 0.368 mg/L).

Table 5.1-3: TSS Load and Removal Amounts for Proposed BMP Configuration

Condition	Total Area (AC)	Existing		Proposed		Existing Post-Treatment Load Generated (lbs/yr)	Proposed Incremental Increase (lbs/yr	TCEQ Required Removal (lbs/yr)	Actual Removal		Load in Treated Runoff (lbs/yr)
		Impervious Area (AC)	Pervious Area (AC)	Impervious Area (AC)	Pervious Area (AC)				lbs/yr	%	
Recharge Zone	278.02	17.67	260.35	65.81	212.21	11,620	52,432	41,946	54,955	104.8	9,096
Transition Zone	21.66	5.68	15.98	9.17	12.49	6,562	3,801	3,041	5,384	141.6	4,979
Total Project	299.68	23.35	276.33	74.98	224.7	18,182	56,233	44,987	60,339	107.3	14,075

Source: RTG, 2014
Note: The area of the transition zone used in this calculation does not include 11.97 acres within the total project area, as the additional 11.97 acres would not require any ground disturbance since work in this area would be limited to pavement markings.

Water quality sampling reported by the COA in Onion Creek below its confluence with Bear Creek, and also below the proposed project site showed TSS loads (reported as total non-filterable residue) ranged from less than one mg/L to 23 mg/L (LCRA, 2013) the same range was reported at a TCEQ sampling site on Upper Bear Creek just downstream from RM 1826 (LCRA, 2014). TSS measurements in Danz Creek reported by Barrett et al. (1995a) above a roadway construction site ranged as high as 266 mg/L and averaged 59.9 mg/L.

TSS, as a design parameter, can include many constituents, and these constituents may vary by source. For instance, constituents found in agricultural runoff, roadway runoff, and grassland runoff may differ in the types and relative amounts of constituents present. Roadway runoff may have elevated amounts of heavy metal constituents that may introduce toxic effects in aquatic environments (Kearfott et al., 2005). Some metals, such as lead are strongly associated with particles while others such as Zinc, Cadmium and Copper are largely dissolved (Sansalone et al., 1997).

Due to high TSS removal rates and the chemical processes that limit the availability of heavy metals, the proposed project would not be expected to have a measureable effect on water quality dependent sensitive aquatic resources such as the Barton Springs or Austin blind salamanders.

The Barton Springs salamander Recovery Plan identifies poor water quality among the threats to the Barton Springs salamander (USFWS, 2005a). Water quality parameters identified include dissolved oxygen, conductivity, sediments, metals, nutrients, pesticides, and hydrocarbons. Barrett and others (1995b) and Geismar (2000) point out that metals, hydrocarbons, chlorinated pesticides, and polychloronated biphenyl (PCB) are hydrophobic constituents that adsorb to sediment particles. Sediment-associated pollutants can also introduce an oxygen demand and influence conductivity (USFWS, 2005b). The treatment of stormwater runoff and the reduction of sediment loading through TSS removal discussed above would mitigate the threats to sensitive aquatic resources such as the Barton Springs salamander.

Groundwater Quantity Impacts

The storage volume of the Barton Springs Segment of the Edwards Aquifer is approximately 306,000 acre-feet (Slade et al, 1986), the average discharge of the Barton Springs Complex is approximately 38,372 acre-feet per year (Smith and Hunt, 2004), the proposed project's impervious surface over the Recharge Zone (approximately 65.8 acres) would catch approximately 175.5 acre-feet of rain in an average year which would drain off as stormwater, and upper estimates of recharge amounts (31.5 percent) would indicate that 55.3acre-feet of that stormwater runoff could potentially recharge to the Edwards Aquifer over the course of an average year. Given these data, potential recharge volumes generated by the proposed project would amount to approximately one one-hundredth of one percent (0.01 percent) of aquifer storage capacity, and were the full amount (55.3 acre feet) to discharge through the Barton Springs Complex, it would account for approximately one-tenth of one percent (0.1 percent) of the average annual discharge.

Sensitive Feature Impacts

Sensitive features would be protected, where applicable, by buffers and temporary BMPs as described in **Section 4.2**. Permanent protections would include stormwater treatment by water quality ponds as well as by structural and vegetative BMPs in other areas. The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge. This would be accomplished in part by the installation of roadside traffic rail and accompanying stormwater infrastructure that would convey roadway runoff to a water quality pond situated outside of the drainage area where the water would be treated and then discharged to Bear Creek. To mitigate the water quantity lost by the overlap of the roadway and the drainage area, approximately 0.7 acre of surface runoff from adjacent, undeveloped areas would be captured and added to the natural surface drainage area of the cave.

Hazardous Materials Impacts to Water Quality

The proposed project could increase the potential for accidental spills of hazardous materials in the state-owned ROW due to introduction of a new-location roadway facility. However, unlike many of the existing roadways in the area, the SH 45SW facility would include water quality ponds/ HMTs with detainment capabilities. These ponds would capture roadway runoff, including hazardous material spills, from all portions of the roadway except in certain small areas in intersections where it is not practicable to establish grades that would allow draining runoff to HMTs.

Detainment volumes would meet or exceed applicable requirements, with the goal of full containment of probable spill volumes. TCEQ (2007a) recommends 10,000 gallon HMT as an optional, enhanced Edwards Aquifer protection measure on roads with the ability to convey at least 25,000 vehicles a day. Cumulative detainment volumes of currently proposed water quality ponds/HMTs would range from approximately 570,240 gallons to approximately 1,505,434 gallons. The design goal of maximizing HMT detainment volumes resulted in the proposed water quality ponds being able to accommodate up to four inches of rain from a single rainfall event. This substantially reduces the likelihood that spill detainment would be compromised in the event of spills that occur during rain events. If, during final design, a decision is made to include separate HMT components in the water quality pond design, those HMTs would hold a minimum of 10,000 gallons.

The Barton Springs Salamander Recovery Plan (USFWS, 2005a) identifies hazardous materials spills on bridges as being of particular concern because of the high recharge potential associated with creeks. Current design would allow for total capture of runoff from bridge surfaces. This would allow for the detainment of hazardous material spills and prevention of contaminated water recharging to the aquifer.

The risk of harm to the Barton Springs salamander from hazardous material spills associated with the proposed SH 45SW would be reduced to insignificant levels by the capture and detainment capabilities of the proposed HMTs.

5.2 Indirect and Cumulative Impacts on Water Quality

The physical boundaries of the SH 45SW Area of Influence (AOI) are bordered by Slaughter Road to the north, RM 1826 to the west, FM 967 to the south, and IH 35 to the east, totaling approximately 41,673 acres. Sensitive resources within the AOI include approximately 66 linear miles of creeks that lie within the AOI, in addition to karst features/groundwater that can be affected by surface water (streams and runoff). Induced growth could have some effect on water resources because induced development would result in increased impervious cover, which could in turn have an effect on water quality. However, surface water and groundwater in the AOI would not be adversely affected in a substantial way from the proposed project because of the high percentage of managed areas and the strict implementation of regulations and BMPs. See ***Indirect Impacts Technical Report*** for additional detail.

Due to the sensitive nature of a few key resources, and the fact that the proposed project could contribute to some induced development within the AOI over the planning horizon, along with other development projects, the cumulative effects to the following resources was analyzed: Golden-cheeked Warblers, the Barton Springs and Austin blind salamanders, Edwards Aquifer – Groundwater Resources, and Surface Water Resources.

The geographic resource study area (RSA) for cumulative effects to surface water is based on the boundaries of three general watersheds that intersect the SH 45SW Study Area as delineated by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) (Bear Creek, Mustang Branch-Onion Creek, and Slaughter Creek-Onion Creek) totaling approximately 87,871 acres. The watershed boundaries were selected for the RSA because all surface water runoff in the proposed project study area (and the anticipated growth areas surrounding the study area) would be contained within the geological features that define the boundaries of these watersheds. Existing regulations and programs, and BMP recommendations put forth by various agencies are set in place to promote and maintain water quality in the area. These would aid in acting as control measures for both surface waters and groundwater for future development projects within the RSA. See ***Cumulative Impacts Technical Report (Appendix I)*** for additional detail.

5.3 SH 45SW Impacts to Aquatic Resources/Potential Salamander Habitat

The *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (2014b) contains a technical report entitled, "Potential for Impacts to Endangered *Eurycea* Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas" which discusses in detail the proposed impacts to listed salamander species. Groundwater and surface water threats to the Barton Springs salamander include contaminants (e.g. heavy metals, polycyclic aromatic hydrocarbons {PAHs}, pesticides), dissolved oxygen decline, effluent discharge, excess nutrients, habitat dewatering, hazmat releases, salinity, sediments, stormwater runoff, and supersaturation (USFWS, 2006). General criteria recommended by USFWS (2006) for the species include:

- Maintaining a high aquatic life use,
- Chloride at 100mg/L,
- Sulfates at 100mg/L,
- Total dissolved solids (TDS) at 500 mg/L,
- A mean of dissolved oxygen at 5.0 mg/L,
- A pH ranging between 6.3 and 8.5,
- Indicator bacteria/ Fecal coliform at 126/200 colonies, and
- Temperature at 71°F.

Water quality parameters that could have the potential to impact the recently listed Austin blind salamander include dissolved oxygen, conductivity, sedimentation, and point and non-point source contaminants (DOI, 2013). According to USFWS's Final Rule on the Austin blind salamander (DOI, 2013), dissolved oxygen needs to be between five to seven mg/L, conductivity should average around 600 µS cm^{-1}, and other contaminants should be below levels that could exert direct lethal or sub-lethal effects.

Due, in part, to the sensitivity of Austin blind and Barton Springs salamander populations, extensive studies quantifying the direct lethality of environmental contaminants are rare. Surrogate salamander species studies (Woods et al., 2010) have contributed to the establishment of common water quality parameter ranges within which populations should be stable. Other direct studies (USFWS, 2005a; COA, 2004) have shown that salamander tolerances to environmental pollutants are often higher than tolerances in relatively sensitive species such as the more frequently tested fish species rainbow trout (*Oncorhynchus mykiss*) and bluegill, which have also contributed to the establishment of tolerance criteria. According to the DOI (2013) "salamander survival, growth, and reproduction will be most successful when water quality is unaltered from natural conditions." Threats related to water quality parameters and pollution constituents include dissolved oxygen, specific conductance, PAHs, heavy metals, and pesticide residues (USFWS, 2005).

Boyles et al. (2006) related increases in urban stormwater constituents including chloride, magnesium, nitrate, potassium, sodium, and sulfate to increases in specific conductance. Of these water pollutants, magnesium and potassium are not attributed to roadway stormwater, while chloride and sodium arising from deicing operations are frequently attributed to roadway stormwater, as are sulfates from road beds and derivatives of fuels (USEPA, 1993). Given the rarity of deicing operations in the Study Area, the only pollutant examined by Boyles et al. (2006) that would be expected to contribute to changes in specific conductance would be sulfates. Furthermore, Mahler et al. (2006) reported specific conductance measurements with an equilibrium value between 530 and 630 microsiemens/cm in the major outlets of the Barton Spring complex except Old Mill Spring, which was frequently above 700 microsiemens/cm. The equilibria in values were disrupted, it was presumed, by storm events which resulted in short peaks followed by sharp drops in conductance. The higher readings in Old Mill Spring may be due to differences in groundwater flow paths. Specific conductance varies due to aquifer levels, recharge rates, and groundwater chemistry. Therefore the proposed project is not expected to have a substantial effect on specific conductance in Barton Springs discharge. Dissolved oxygen, another water quality parameter of concern, is a product of complex physical, chemical, and biological interactions. As previously discussed, BMPs proposed for the SH 45SW project would reduce many constituents that contribute to chemical and biological oxygen demand in roadway stormwater. BMPs would also reduce transport of heavy metals and pesticide residues, two hydrophobic pollutants that may threaten Barton Springs salamanders. In discussions pertaining to pollution threats to Barton Springs salamanders, USFWS (1992) pointed out that heavy metal availability and toxicity are reduced in hard water, and that Barton Springs discharge is classified as very hard. In respect to pesticide residues, TxDOT would not apply herbicides in the proposed project corridor.

There would be no direct effects to the Barton Springs or Austin blind salamanders resulting from construction and operation of the proposed project. The project would use BMPs that would allow for the removal of TSS that would exceed 90 percent of the TSS load

associated with the incremental increase in impervious cover over the EARZ. During construction, the BMPs would include erosion controls and sediment controls. The completed project would include facilities to collect and treat runoff prior to discharging it offsite. These treatment structures would be installed as early as practicable in the construction phase to allow for the treatment of construction phase runoff. The project would comply with TCEQ's Edwards Aquifer Rules and TPDES standards. In addition, the project is more than nine miles from Barton Springs. Given all of these facts, the TSS load on the aquifer and Barton Springs would be potentially less than the No-Build alternative. This shows that the project would have no effect on the species or their habitat. These controls limit the potential for cumulative effects, as discussed in the ***Cumulative Impacts Technical Report (Appendix I).***

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Attachment 1
Review and Evaluation of Water Quality Protection BMPs Potentially Applicable to the SH 45SW Study Area

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A.1 Introduction and Overview

The SH 45SW study area is partially located within the Barton Springs segment of the Edwards Aquifer Recharge Zone. Studies have demonstrated that a high percentage of rainfall in the area directly recharges the Edwards Aquifer (Hauwert, 2009). The Edwards Aquifer is environmentally sensitive and represents an invaluable resource in Central Texas (USFWS, 2005). Bear Creek is the primary surface drainage feature in the study area and represents an intermittent stream which, during rainfall events, directly supplies water to the Edwards Aquifer. In addition, other sensitive features such as caves and sinkholes are present within the study area. Construction of SH 45SW presents concerns regarding the potential impact on both water quality and quantity within the Edwards Aquifer during construction and subsequent operation of the highway, as well as additional development which may occur as a result of increased access to the area (Hauwert, 2011). These concerns include, but are not limited to:

- Potential impact to the quality of surface water during rain events due to increased sediment load on drainage features in the area;
- Potential impacts of polluted highway runoff on public and private water wells down-gradient of the study area;
- Preserving cave habitat of sensitive species and species of concern known to be present in Flint Ridge Cave and other caves that may be present in the area, as well as protecting the cave resource itself;
- Protecting the quality of groundwater recharging and moving through the aquifer and therefore the quality and quantity of water discharging at Barton Springs; and
- Protection of endangered species endemic to Barton Springs--the Barton Springs salamander and the Austin blind salamander.

This section presents a summary of known and potentially applicable best management practices (BMPs) for protecting surface and groundwater resources during construction activities, as well as a review of post-construction BMPs designed to minimize and mitigate sediments. A focus will be on innovative BMPs and alternative strategies to improving water quality. A summary of the efficacy of identified BMPs will also be discussed, and methods for evaluating effectiveness of BMPs in series will be presented. Given the hydrogeologic setting of the study area, discussion of BMPs applicable to protection of sensitive features, including caves, will also be included. The initial evaluation of BMP alternatives is based on general acceptance by TCEQ and in central Texas as an approved BMP on the proposed project site, TSS removal efficiency, maintenance requirements, and cost relative to similar BMPs (see **Table A.1-1**).

Table A.1-1: SH 45SW Initial Evaluation of BMP Alternatives

BMP	TCEQ Approved/ Accepted in Austin Area	TSS/Pollutant Removal Efficiency	Cost	Maintenance Requirements	Carried Forward?
Silt Fence	Yes[2]	Medium	Low	Low to Medium	Yes
Rock Berm	Yes[2]	Medium	Low	Low	Yes
High Service Rock Berm	Yes[2]	Medium	Low	Low	Yes
Brush Berm	Yes[2]	Low to Medium	Low	Low	No
Erosion Control Logs	Yes[2]	High	Low	Low	Yes
Sedimentation Basin/Trap	Yes[2]	Medium to High	Medium	Medium to High	No
Hay Bale Dike	No[1]	Low	Low	Medium	No
Natural Buffers	Yes[1]	Low	Low[1]	Medium[1]	Yes
Hazardous Materials Trap	Yes[2]	High	Medium to High	Medium to High	Yes
Retention – Irrigation	Yes[2]	High (100)[1]	Medium[2]	High[2]	No
Wet Basin	Yes[2]	High (93)[1]	High[2]	Medium to High[2]	No
Batch Detention Pond/Basin	Yes[3]	High (91)[3]	Medium[3]	Medium to High[3]	Yes
PFC Pavement	Yes[3]	High (90)[3]	High[3]	Medium[3]	Yes
Constructed Wetland	Yes[2]	High (89)[1]	High[2]	Medium to High[2]	No
Sand Filter	Yes[2]	High (89)[1]	High[2]	Medium[2]	Yes
Bioretention	Yes[2]	High (89)[1]	Medium[2]	Medium to High[2]	TBD
Vegetative Filter Strip	Yes[2]	High (85)[1]	Low[2]	Low[2]	Yes
Extended Detention Basin	Yes[2]	Low (75)[1]	Medium[2]	Medium[2]	No

Table A.1-1: SH 45SW Initial Evaluation of BMP Alternatives cont'd

BMP	TCEQ Approved/ Accepted in Austin Area	TSS/Pollutant Removal Efficiency	Cost	Maintenance Requirements	Carried Forward?
Grassy Swale	Yes[2]	Low (70)[1]	Low[1]	Low to Medium[2]	Yes
Alum Treatment	No	High	Unknown	Low	No
Infiltration Basins	No[2]	High	Medium to High	Low	No
Proprietary BMPs	Yes[1]	Medium to High	Medium to High	Very High	No
Wet Vault	Yes[1]	Low (0)[1]	High[2]	High[2]	No
Bottomless Culverts	Yes	N/A	Medium to High	Low	Yes

Source: TxDOT Construction Stormwater Management Program (http://www.txdot.gov/inside-txdot/division/environmental/programs/swmp.html);
1. TCEQ, 2009
2. TCEQ, 2005
3. TCEQ, 2012

BMPs are a collection of water pollution control practices established by federal, state and local regulatory agencies to minimize and mitigate potential adverse effects of development on an area (EPA, 2000). BMPs typically used for controlling stormwater runoff are categorized as either structural or non-structural practices (Webster et al., 2003). Structural BMPs operate by trapping and detaining runoff water until potential unwanted sediments and pollutants can settle out or filter into the underlying soil. Non-structural BMPs typically emphasize source control practices designed to minimize and/or prevent the accumulation of pollutants. Non-structural BMPs can be viewed as a "first line of defense" and can be considered any practice that reduces potential impacts to surface or groundwater (EPA, 2000). These non-structural BMPs represent a broad approach and can significantly improve the operation and maintenance of structural BMPs, thereby increasing the effectiveness and potentially reducing costs (NRDC, 2011).

Existing data indicate that heavy metals, total petroleum hydrocarbons (TPH--such as oil and grease), TOC and chemical oxygen demand (COD) are often attached to sediment particles (Webster et al, 2003). Therefore, the primary constituent consistently used as a benchmark for BMP effectiveness is typically total suspended solids (TSS) because of the detrimental effect sediments and their adsorbed pollutants can have on water quality. TSS is easily measurable and removal of suspended particulate matter also removes many associated constituents. The TCEQ-required 80 percent removal of the incremental increase in TSS load associated with a

project is the performance standard that is the generally accepted water quality target for stormwater runoff (NCHRP, 2006); however, higher water quality standards that are desired in the Barton Springs Segment of the Edwards Aquifer are discussed below.

Efficiency standards are typically calculated using event mean concentration (EMC) and the formula below:

$$\text{EMC efficiency (percent)} = [(Conc_{in} - Conc_{out})/Conc_{in}]*100$$

Where $Conc_{in}$ is the EMC at inflow and $Conc_{out}$ is the EMC at outflow (Davis et al., 2011).

It is recognized that utilizing percent effectiveness may be skewed based upon factors such as influent concentrations, size of rain events, and first flush (Winer, 2000). Therefore, data regarding effectiveness presented within this document is intended as an overview of effectiveness, and specific studies simulating study area site conditions (environment, rainfall, surface area, sediment load calculations, etc.) would be reviewed to evaluate BMP effectiveness under a given set of conditions. The International BMP Database project (http://www.bmpdatabase.org), begun in 1996, has assembled an extensive collection of reports and analyses for a variety of BMP performance studies and was designed to facilitate efficient data entry and retrieval through a user-friendly interface (NCHRP, 2006).

Structural BMPs such as diversion dikes, spreaders, interceptor swales, and mulching controls are designed to prevent erosion during construction, while BMPs such as sediment traps and basins, rock berms, silt fences, and mulch socks are designed to keep sediment onsite. These BMPs can be temporary (construction BMPs) or permanent (post-construction BMPs). The TCEQ has developed “Complying with the Edwards Aquifer Rules Technical Guidance Document on Best Management Practices” as guidelines to comply with the Edwards Aquifer Rules as found in Title 30 of the Texas Administrative Code (TAC) Chapter 213. In addition, the City of Austin (COA) Watershed Protection Department (WPD) has prepared an Environmental Criteria Manual (COA ECM) meant to facilitate compliance with the city's watershed ordinances and provide water quality protection over the Edwards Aquifer Recharge Zone (Barrett et al., 1995c). The manual provides calculations and designs to standardize planning, application, and implementation of BMPs and provides additional guidelines to address construction activities within designated areas, which are designed to achieve non-degradation of groundwater resources (COA, 2013). An array of guidance manuals were consulted to inform decisions on BMP availability and applicability to SH 45SW. This guidance was considered during the preliminary BMP selection process in an effort to identify the best suited and best performing options for the protection of water quality. Final selection would, of course, be influenced by regulatory requirements applicable to the proposed project. Final BMP design would take place during the final design/Plans, Specifications & Estimates (PS&E) phase of project development and would be reflected in the SWPPP, WPAP and construction plan sets.

A.2 Best Management Practices During Construction

The primary concern during construction is that erosion caused by removal of vegetation during construction activities would increase sediment loads which could impact and adversely affect surface water and ultimately groundwater within the study area (Hauwert, 2011). Protection of surface and subsurface drainage areas from excessive sediments is necessary to preserve the quality and quantity of water entering the Edwards Aquifer (TCEQ, 2007a). Erosion protection, sediment control, and runoff flow control BMPs should be selected using a process that evaluates unique site conditions and selects those BMPs to specifically address the need in that area (USFWS, 2007).

A.2.1 Construction Planning

When working in the Edwards Aquifer Recharge Zone, it is recommended that pre-construction planning identify all areas with potential for erosion problems (Barrett, 1995b). The TCEQ (TCEQ, 2005) recommends evaluating the following prior to beginning construction activities:

- Development siting should follow natural contours;
- Schedule proposed project during dry season (July and August);
- Plan and stage activities so that construction disturbs the smallest area for the least amount of time;
- Manage construction materials (locating potential sources of pollutants; borrow areas, litter, daily construction debris, chemicals, etc… away from sensitive features);
- Establish controls for protecting vegetation such as taping off area not to be disturbed; and
- Evaluate potential for up-gradient runoff.

The effectiveness of construction BMPs is site dependent and directly related to the proper design, installation, monitoring, operation, and maintenance of each BMP which should be addressed within the erosion and sedimentation control plan. Proper planning and use of advanced stormwater quality controls is necessary to address concerns regarding the potential impacts both during project construction and subsequent operation on both the water quality and quantity within the Edwards Aquifer. It should be noted that effective erosion control is a cost saving measure because repair of erosion features is costly and can have environmental impacts (TCEQ, 2005).

Within the study area, applicability, design and implementation of BMPs would be based on specific site conditions and location of sensitive features. TCEQ has published standard

protocols and detailed BMPs to mitigate impacts of construction and post-construction activities within the sensitive EA Recharge Zone (TCEQ, 2005).

TCEQ (2005) states that inspection and maintenance of erosion and sedimentation controls are vital to their performance. They recommend that an individual be assigned responsibility for operating erosion control and sedimentation practices and that those measures be inspected daily when construction activities are located on or adjacent to sensitive features (TCEQ, 2005).

Table A.2-1 summarizes BMPs deemed acceptable by TCEQ for erosion control and sediment management in the Edwards Aquifer Recharge Zone during site construction activities. Not all of the BMPs would necessarily be utilized in the study area.

Table A.2-1: Summary of BMPs for Use During Construction

Erosion Control	Application	Efficiency	Efficiency Source
Diversion, Interceptor and Perimeter Dike	Divert and/or intercept runoff from disturbed area	NA	
Interceptor and Perimeter Swales	Divert and/or intercept runoff from disturbed area	NA	
Stone Outlet Structure/Level Spreader	Outlet device for dikes and diversions	NA	
Pipe Slope Drain	Transport runoff down steep slopes	NA	
Polyacrymide (PAM)	Erosion control	NA	
Outlet Stabilization	Prevent erosion at outlet	NA	
Subsurface Drain	Prevent soils from becoming saturated	NA	
Mulching	Stabilization of non-vegetated areas	NA	
Sod	Immediate stabilization of disturbed soil	NA	
Dust Control	Prevent excessive migration of air borne particles on or off site	NA	
Sediment Management			
Construction Site Exit	Minimize and trap sediment dispersal resulting from construction traffic	NA	
Silt fence	To intercept sheet flow, trap and filter sediment	71-85	Holloway, 2010
Triangular filter Dike	Intercept and detain sediments associated within site areas requiring frequent access		
Rock Berm/High Service Rock Berm	Flow diverters, grade control and level spreaders to disseminate concentrated flow	75	FDEP, 2013
Brush/Mulch Berm	To intercept sheet flow, trap and filter sediment	95	COA, 2012a
Vegetative Buffer Strips	On floodplains, near wetlands and on steep slopes		
Inlet Protection	Prevent sediment from entering storm drain system		

Table A.2-1: Summary of BMPs for Use During Construction cont'd

Erosion Control	Application	Efficiency	Efficiency Source
Sediment Traps	Use to intercept sediment-laden runoff where flows concentrate in drainage way	75	FDEP, 2013
Sediment Basin	Engineered basin designed to capture runoff and sediment for large disturbed areas	75	FDEP, 2013
Mulch Sock/Filter Rolls	To intercept sheet flow, trap and filter sediment	95	COA, 2012a
Spill Prevention	Used on all sites to reduce spills		
Hay Bale Dikes	Intercept and retain small amounts of sediments from small unprotected areas	95	COA, 2012a

(Modified from COA ECM, 2013 and TCEQ, 2005)

Detailed descriptions and specifications for each of the above controls can be found in TCEQ (2005) and in the COA ECM (Section 1.4.5).

BMPs should be evaluated and designed using recommended design values for functional controls as presented in various literature. These criteria would allow proper sizing and placement of construction BMPs to achieve results that are protective of water quality and quantity in the study area. Pertinent discussions of these principles are offered by USEPA (2000), COA, (2013), and NRDC (2011) among others.

Structural BMPs can be used in series where a combination of one or more practices (also known as "stacked BMPs" or a "treatment train") is necessary to minimize the impacts of construction activities on water quality and achieve water quality goals (NRDC, 2011). Effectiveness of BMPs in series can be calculated using percent effectiveness (NJSBMP, 2004; TCEQ, 2005; TCEQ, 2009; COA, 2013); although equations vary between regulatory agencies, several guiding principles are offered (NJSBMP, 2004; COA, 2013):

- BMPs with the lowest TSS and nutrient removal efficiencies should be first in the series;
- BMPs with relatively easier access for maintenance (e.g. debris and sediment removal) should be first in the series;
- BMPs should be established on sound engineering principles;
- Each BMP in a series should be sized on the same runoff capture volume;
-
- BMPs in series should be of different types unless demonstrated that a second control is effective; and
- No additional pollutant removal beyond three controls should be assumed.

Design constraints often dictate the arrangement of BMPs and the guiding principles above may not be applicable. Design constraints and guidance from TCEQ (2005 and 2009) would be used to inform final BMP arrangements and to calculate the efficiencies of a series of BMPs.

The following calculation could be used to determine the efficiency of a series of BMPs for the proposed project:

$E_{tot} = [1 – (1-E_1)(1-0.65E_2)(1-0.25E_3)] \times 100$

E_{tot} = the total combined pollutant removal efficiency

E_1 = the efficiency of the first control (decimal fraction)

E_2 = the efficiency of the second control (decimal fraction)

E_3= the efficiency of the third control (decimal fraction)

(from TCEQ 2005 and 2009)

Calculations using this formula are intended to represent potential effectiveness and assume that the efficiencies and stipulations described by TCEQ (2005 and 2009) are being met.

A.3 Water Quality Protection BMPs

Concerns regarding impacts to groundwater were discussed in **Section A.1** and include concerns over the potential impact of sediments on known sensitive features (e.g. caves and sinkholes) and significant recharge features (i.e. Flint Ridge Cave) within the study area and immediately down-gradient (Hauwert, 2011). The primary concern is that sediments generated during construction may transport pollutants into the aquifer, thus reducing water quality, and/or plug existing recharge features thus reducing quantity of recharge to the aquifer (Barrett, 1995b). These impacts could potentially have a detrimental effect on discharge flow at Barton Springs and affect sensitive and endangered species endemic to the springs (USFWS, 2005). In addition, rare troglobitic species known to inhabit Flint Ridge Cave (COA, 2012b) could be impacted without proper controls.

This section discusses structural BMPs that could be implemented to mitigate sediments and associated pollutants both during and post-construction, the use of hazardous material traps as a spill prevention measure and protection of caves.

A.3.1 Pre-construction Water Quality Protection BMPs

A Geologic Assessment of the state-owned ROW has been performed in accordance with TCEQ requirements (TCEQ, 2004) to identify sensitive features for evidence of significant recharge and other environmental significance (TCEQ, 2005; TCEQ, 2007b). A brief overview of targeted features is presented below:

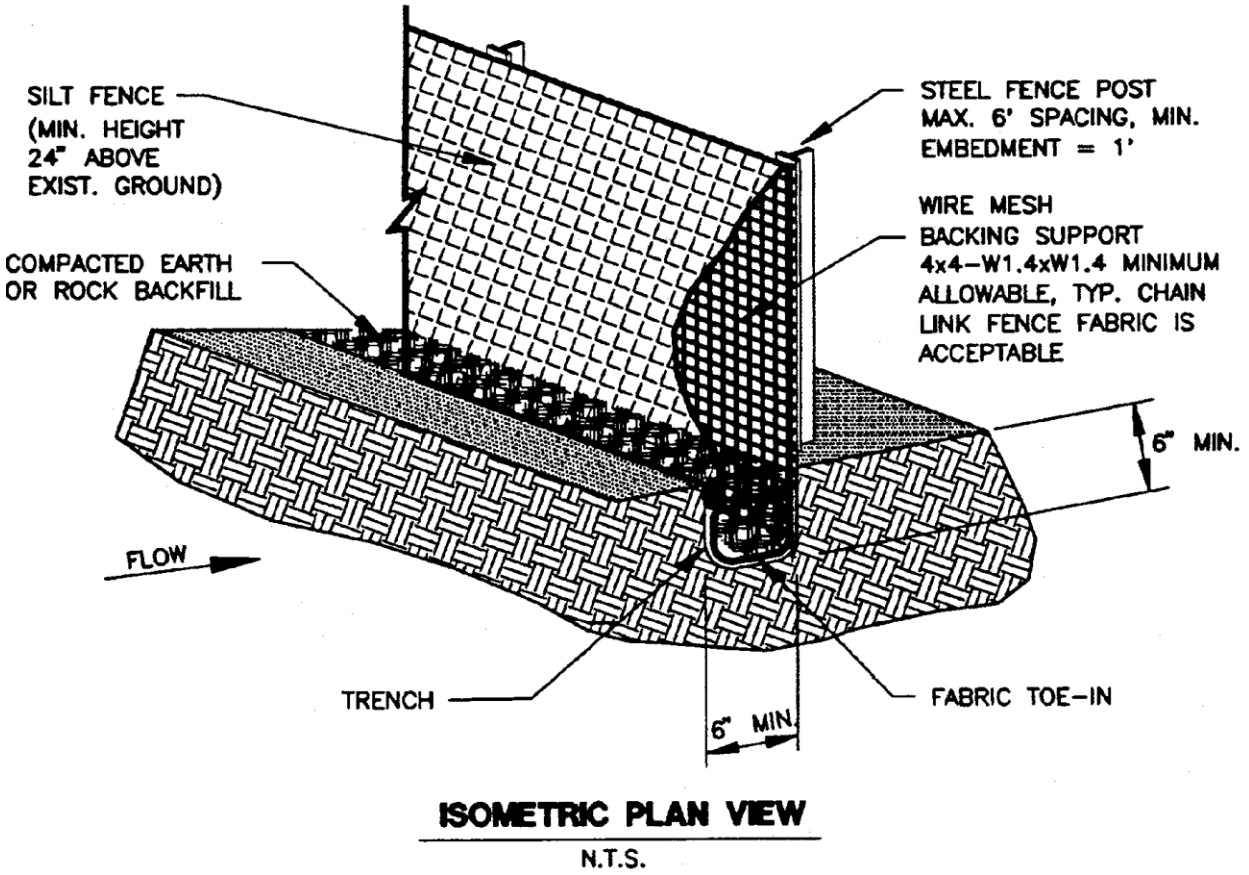
- Point recharge and other significant features such as ecologically, culturally or historically sensitive features;
- Sensitive features such as caves and sinkholes with or without openings;
- Natural buffers measured from the steep slope break of the feature and include subsurface voids and natural drainage areas where discernible;
- Features that lack significant recharge but may open during construction; and
- New features discovered during construction.

Sensitive features identified during the Geologic Assessment would be addressed during final design and appropriate BMPs would be identified (TCEQ, 2005; TCEQ, 2007b). The TCEQ specifies a natural buffer size based upon the drainage area of the sensitive feature (TCEQ, 2005; TCEQ, 2007b). Natural vegetative buffers should be maintained to the maximum extent practicable (COA, 2013; TCEQ, 2007b). In addition to natural buffers, erosion and sediment BMPs for void protection should be employed as appropriate. **Table A.2-1** presents sediment control BMPs that may be used to protect sensitive features.

A.3.1.1 Silt Fence

A silt fence is a barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. Efficacy of silt fence is highly dependent upon the material, load and proper installation and maintenance of the fencing. Data collected during filtering tests on silt fence material indicated silt fence fabric can retain between 71 and 85 percent TSS depending on the fabric size selected and the sediment size distribution (Holloway, 2010). Silt fences cause runoff to pond, allowing heavier solids to settle out. Silt fences are most effective when used as retention BMPs and not relied upon to filter runoff. Proper installation is crucial to effectiveness and inspection should occur frequently, especially after rain events. Silt fences would be carried forward for use in the proposed SH 45SW project, and would be used in situations with flow disruption and water ponding the primary focus of their use as opposed to reliance on their filtering capabilities. A schematic illustration of a silt fence taken from TCEQ, (2005) is shown in **Figure A.3-1**.

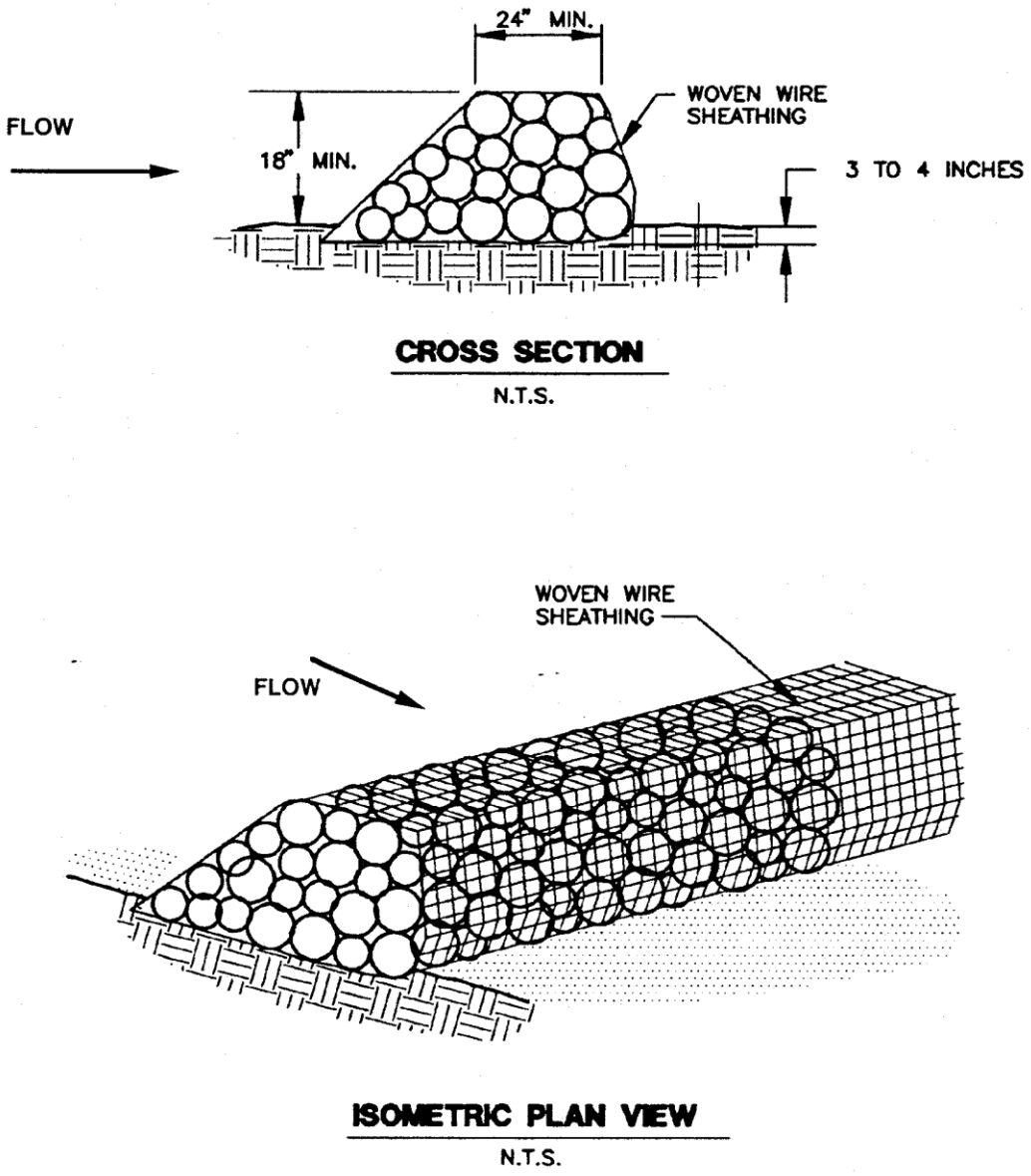
Figure A.3-1: Silt Fence



A.3.1.2 Rock Berms and High Service Rock Berms

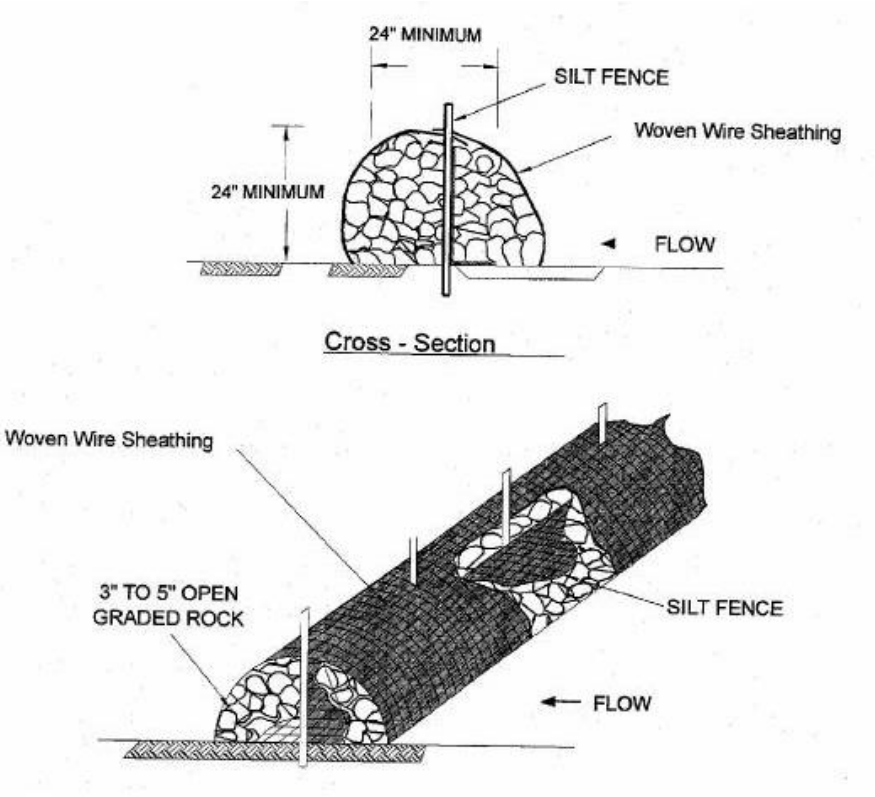
Rock berms serve as check dams in areas of concentrated flow to intercept sediment laden runoff, detain the sediment, and release the water as sheet flow. Rock berms are used in areas where the flow volume is too great for a silt fence. Depending on the particle size distribution, slope, and other site specific parameters, standard rock berms retain approximately 70 percent TSS (FDEP, 2013) to 95 percent TSS (EPA, 2014) because construction material is generally of coarse rock allowing fines to pass. TxDOT standards for rock berm design are presented under Item 506 in the specification manual (TxDOT, 2014a). A rock berm schematic is presented (taken from TCEQ, 2005) in **Figure A.3-2**.

Figure A.3-2: Rock Berm



A high service rock berm is one constructed utilizing both silt fence and rock berm designs. These are also referred to as fabric lined rock berms and are designated for use around areas of environmental importance such as the natural buffers around caves or other sensitive features (TCEQ, 2005). They can withstand higher flows than traditional silt fence and can also represent an acceptable permanent BMP provided drainage in the area is adequate. The most common problem is that berm height or length is insufficient and runoff escapes over or around. It is not recommended they be used in stream beds as diversion scour often occurs. A schematic taken from TCEQ (2005) of a typical high service rock berm is shown in **Figure A.3-3**.

Figure A.3-3: High Service Rock Berm



Effectiveness of a high service rock berm can be estimated using the formula mentioned earlier. Combining the efficiency of silt fence (85 percent) with the efficiency of a rock berm (70 percent), the total efficiency of these BMPs in series can be calculated:

$E_{tot} = [1 – (1-E_1)(1-0.65E_2)(1-0.25E_3)] \times 100$

Where $E_1 = 0.7$, $E_2 = 0.85$ and $E_3 = 0$

This series yields a TSS removal efficiency of 87 percent. This calculation assumes a rock berm as E_1, and a silt fence as E_2. Additional BMPs at a sensitive feature could further reduce potential water quality impacts.

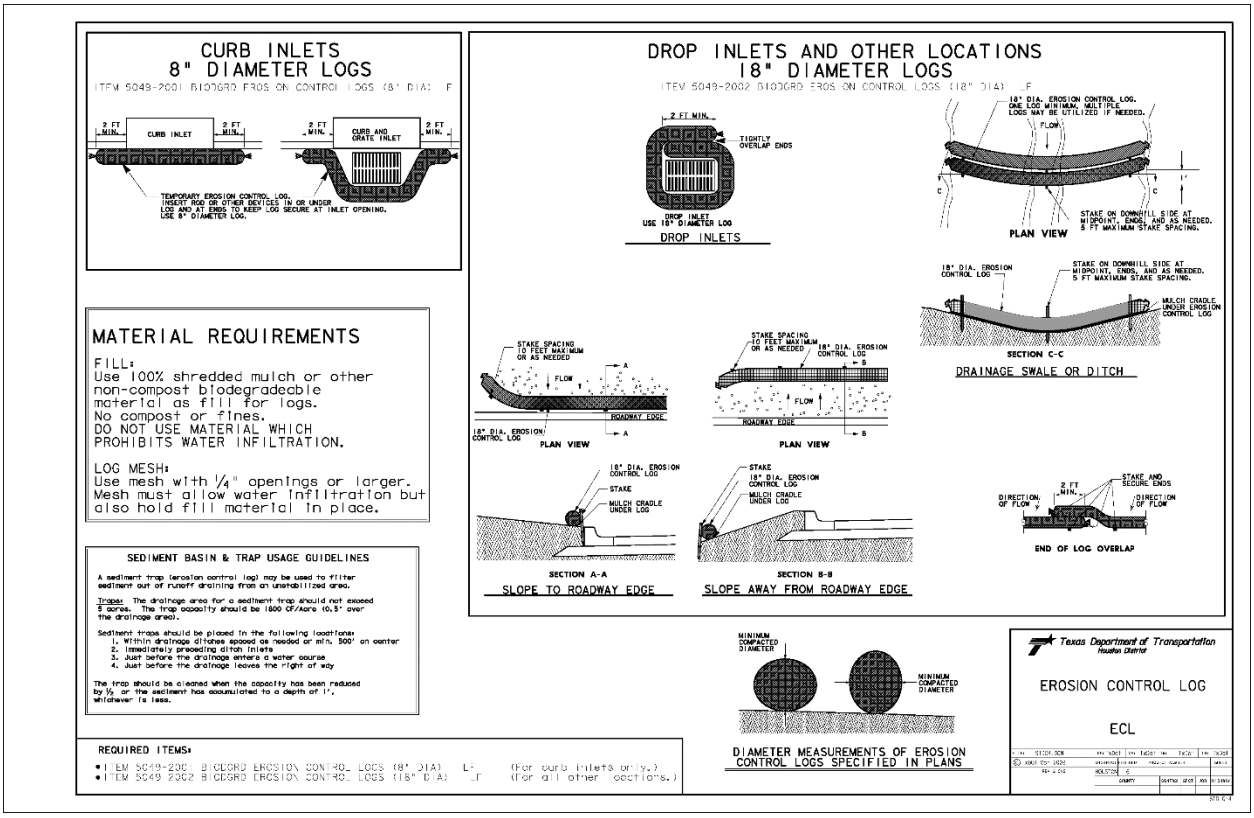
Rock berms and high service rock berms would be carried forward for consideration as appropriate BMPs for the proposed SH 45SW.

A.3.1.3 Brush Berms and Erosion Control Logs

Brush berms and erosion control logs (also known as mulch socks) can be constructed using native vegetation cleared from the site or material purchased offsite. Erosion control logs and brush berms can be utilized to intercept sheet flow and filter sediments as well as allowing

sediments to settle out behind the berm. This represents a “green” alternative to traditional silt fence but should not be used in areas with significant flow velocity. Erosion control logs are generally more resilient than silt fencing; they are better able to withstand impacts from equipment, and damage to log segments is typically easier to repair. Erosion control logs can be seeded or unseeded and as a result can be left in place upon completion of activities. TxDOT Standard Specification Item 506 provides specifications for core materials, containment mesh, and sizes of biodegradable erosion control logs (TxDOT, 2014a). Mulch socks have demonstrated a 95 percent TSS removal rate (COA, 2012a). A study comparing the effectiveness of silt fence with seeded and unseeded compost berms, hay bales as well as compost filter/mulch socks found that hay bales retained most TSS but seeded compost berms performed better than the other BMPs tested (Storey et al, 2006). This may be attributed to allowing the berm to establish itself for 45 days prior to testing. The TxDOT specification diagram for biodegradable erosion control logs is presented in **Figure A.3-4**.

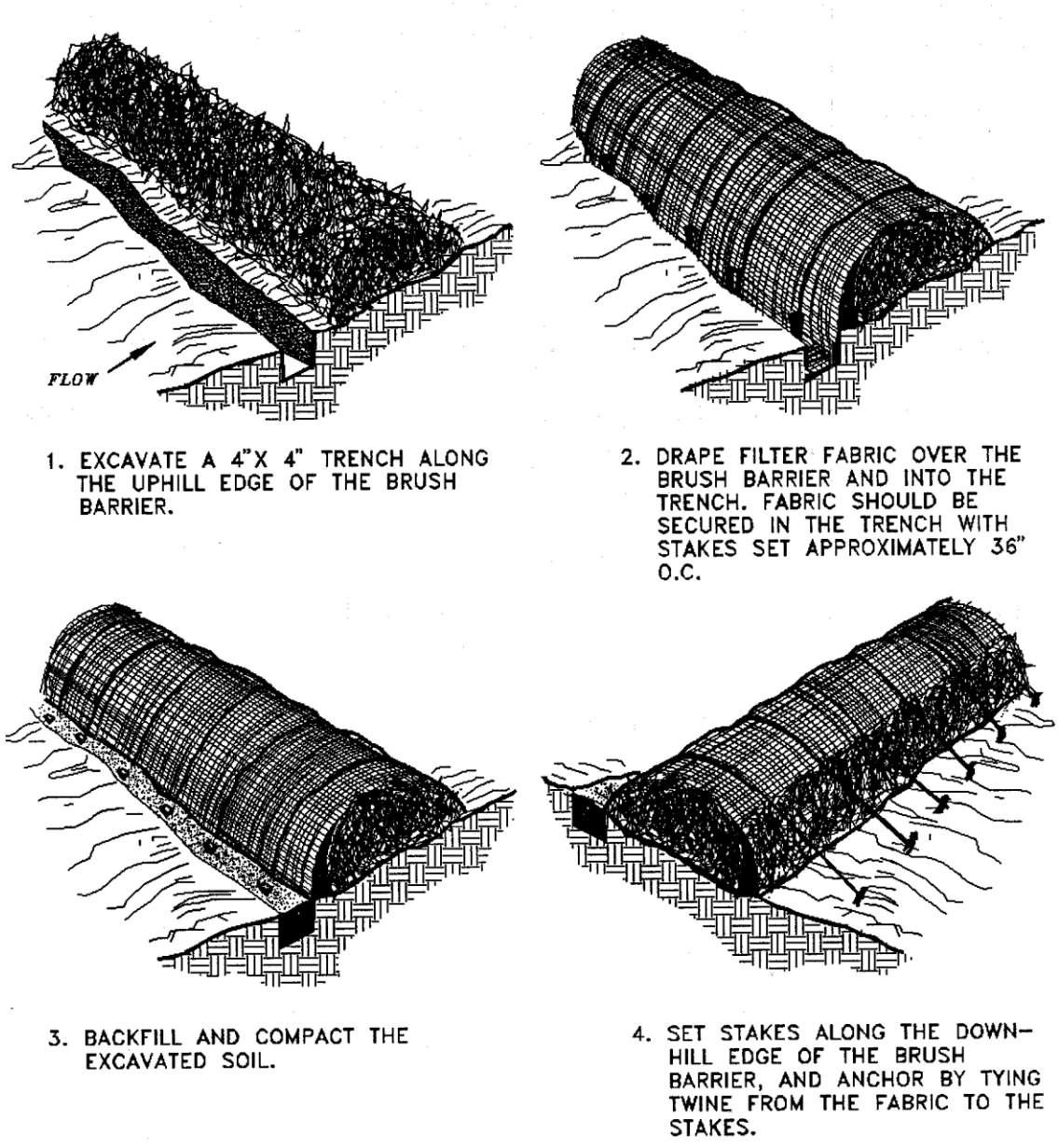
Figure A.3-4: Erosion Control Logs



Source: TXDOT Specification Items 5049-2001 and 5049-2002

Brush berm configuration and construction criteria as specified by TCEQ (2005) is shown in **Figure A.3-5**.

Figure A.3-5: Brush Berm Configuration



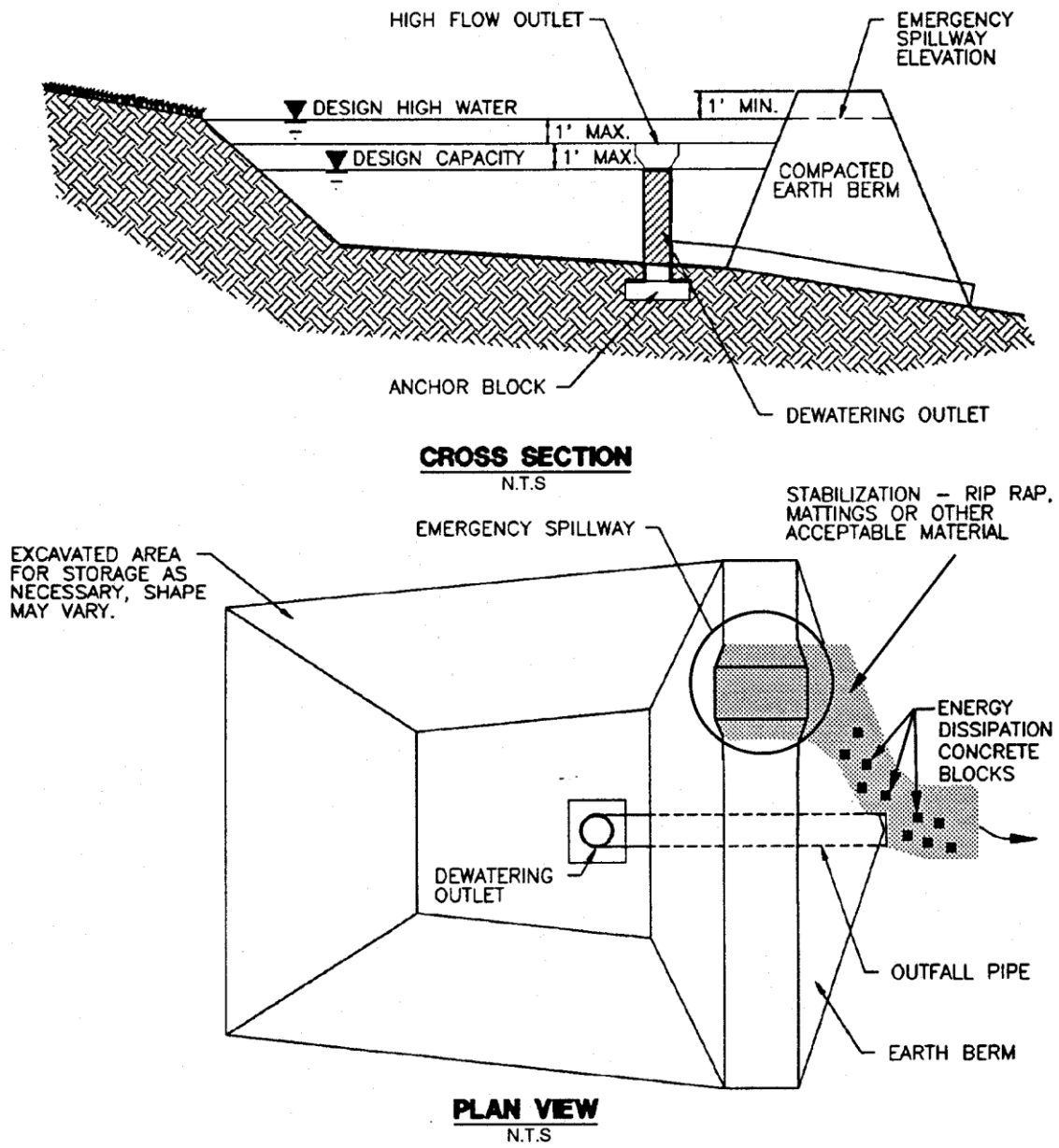
Brush berms and erosion control logs should be inspected frequently and repaired and/or modified as needed. Caution should be taken when using these BMPs around sensitive features in case of failure as organic material contained in the berms or socks could negatively impact water quality (Storey et al, 2006).

These BMPs would be carried forward for consideration and possible use on the proposed SH 45SW. Erosion control logs, in particular, would be considered for use in a number of locations due to their resiliency in project work areas.

A.3.1.4 Sediment Basins and Traps

Sediment basins are earthen embankments designed to intercept runoff from a disturbed area in order to protect adjacent and downstream areas from damage by runoff containing sediment. The basin is often used as a primary BMP during construction activities because it allows runoff to be captured and then released slowly giving sediments time to settle out. Sediment basins differ from sediment traps in that basins are generally larger and can accept runoff from a larger area. In addition, they differ in their outlet structure and are usually designed with a skimmer (COA, 2013). Criteria and recommendations for sediment basins and traps are presented in TCEQ (2005) guidance document, Section 1. 4.13. Sediment basins and traps would only be considered in situations where excavation would not be necessary for their installation. Due in part to the design goal of early installation of water quality ponds for on-site runoff detainment and treatment (which could serve the same purpose as temporary sediment basins), the use of sediment basins would not be an expected necessity. A schematic of a sediment basin, taken from TCEQ (2005) is presented in **Figure A.3-6**.

Figure A.3-6: Sediment Basin



Sediment basins and traps are standard and effective construction BMPs that can be planned and sited for use as permanent BMPs. They have TSS removal efficiencies of approximately 75 percent (FDEP, 2013). Demonstrating use as a BMP in a series, one can combine the efficiency of a sediment basin (75 percent) with the efficiency of a rock berm (70 percent) and a mulch sock (95 percent). The total potential effectiveness of these BMPs in series can be calculated using the TCEQ formula:

$$E_{tot} = [1 – (1-E_1)(1-0.65E_2)(1-0.25E_3)] \times 100$$

Where E_1= 0.70, E_2= 0.75 and E_3= 0.95

This BMP series could yield a TSS removal efficiency of 88 percent. Site specific design considerations could further increase efficiency especially if additional BMPs were utilized.

A.3.1.5 Hay Bale Dikes

Hay bale dikes can be used to intercept and detain small amounts of sediments in areas of limited extent. Hay bale dikes are subject to failure by disintegration and can thereby result in releases of previously detained sediment and the hay itself. TCEQ (2005) recommends limited applications as wind barriers or secondary filters for hay and straw bales. Similarly, TxDOT recommends their use only in instances when other sedimentation control options are not available (TxDOT, 2004). The applicability of this BMP could be evaluated for use on any construction staging area if conditions apply. Hay bale dikes have a demonstrated TSS removal efficiency of 95 percent (COA, 2012a).

Due to the potential for failure and subsequent release of sediment, hay bale dikes would not be carried forward for consideration in applications of waterborne sediment control for SH 45SW. Per TCEQ (2005) guidance, they may be used in dust suppression applications.

A.3.2 Construction Water Quality Protection BMPs

Sensitive features identified during construction require protection as defined in Title 30 of the TAC, Chapter 213.5(f). Voids greater than six inches in any direction that are encountered during construction activities, that are observed within trenches, or in excavations greater than five feet in depth would be reported to the TCEQ. Procedures for investigating voids are presented below. Selection of void mitigation measures would be based on void classifications which are dependent on the size of void, presence of water flow, and evidence of biological activity. Materials designated acceptable for use in void mitigation are:

- Hard rock devoid of fines;
- Controlled low strength material (CLSM)/Flowable Fill;
- Filter fabric;
- Polypropylene bags filled with pea gravel; and
- Gravel backfill, and permanent turf reinforcement mat (PTRM).

These materials should be utilized for construction of BMPs used for void mitigation measures based upon the type and location of feature as specified in the TCEQ (2005), Section 5.2. Table 2.1 in the TCEQ (2005) specifies minimum protective standards for sensitive features encountered during trenching activities and could represent a decision tree or guidance for dealing with sensitive features encountered during construction of SH 45SW.

According to TCEQ, sensitive features such as sink holes, solution cavities, or solution enlarged fractures, identified as part of the Geologic Assessment, should have a natural buffer

that is established based on the size of the feature's drainage area. Here, the drainage area is defined as the edge of frequently well-defined, bowl-shaped depression that surrounds the feature's surface opening. Natural vegetation, particularly live oaks, should be preserved in the natural buffer. The natural buffer should extend a minimum of 50 feet in all directions from the edge of the drainage area. In instances when the drainage area extends more than 50 feet from the feature, the natural buffer should be to the boundary of the drainage area or 200 feet, whichever is less. Optional enhanced measures for feature protection include natural buffers that extend 150 feet from the drainage area in all directions, an infeasible option due to proximity of several features to the state-owned ROW. Where drainage areas exceed this standard, natural buffers should be extended to the edge of the drainage area or 300 feet, whichever is less (TCEQ, 2007a). If buffers cannot be optimally sized due to proximity to construction (as is the case for SH 45SW), the best practical configurations should be utilized. A natural vegetative buffer around the feature should be maintained and construction activities in the area limited whenever practicable. TCEQ establishes additional criteria and guidance for handling extenuating circumstances should they arise (TCEQ, 2007a). Sediment control BMPs can be used to protect identified features by diverting water from the area and/or using BMPs in series to collect and filter runoff. A study evaluating rock and peat filters used to protect sinkholes indicated that peat filters were effective at removing 80 percent TSS and recoverable metals and rock filters removed approximately 33-76 percent TSS and 35-55 percent recoverable metals (Webster et al, 2003).

Demonstrating use as a BMP in a series, a project could potentially combine the effectiveness of a sediment basin (75 percent) with the effectiveness of a high service rock berm (92 percent) and the effectiveness of a peat filter (80 percent), the total effectiveness of these BMPs in series can be calculated using the TCEQ formula:

$E_{tot} = [1 – (1-E_1)(1-0.65E_2)(1-0.25E_3)] \times 100$

Where $E_1 = 0.75$, $E_2 = 0.92$ and $E_3 = 0.80$

This series yields a TSS removal efficiency of 92 percent. Site specific design considerations could further increase efficiency if additional BMPs were utilized.

Additional karst features such as swallets are known to exist within the bed of Bear Creek down-gradient of the proposed SH 45SW state-owned ROW (Hauwert, 2011). Swallets are points where surface water leaves the surface and flows underground. While none are known within the study area, if identified, these swallets could be protected using swallet grates during construction activities to minimize potential for pollutant laden sediment to enter the aquifer (Thuesen, 2013). These grates could also be considered should additional sensitive features be discovered during construction.

A.3.2.1 Known Significant Recharge Feature – Flint Ridge Cave

The SH 45SW state-owned ROW crosses a portion of the surface drainage basin for Flint Ridge Cave (FRC). FRC is a major cave and significant recharge feature located in the study area and the SH 45SW state-owned ROW passes within approximately150 feet of the cave entrance (Hauwert, 2011). The cave is currently gated and bi-annual cave faunal surveys and cricket counts are being conducted (BCCP, 2011). In addition, the COA WPD monitors stormwater catchment in the area (BCCP, 2011). Conceptual BMPs for FRC and other recharge features in the area are discussed below. The *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas* (2014b) includes a detailed assessment of "Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas".

A.3.2.2 BMPs for Protection of Sensitive Features

Temporary or permanent BMPs should be used around sensitive features to protect recharge water quality and quantity. Other BMPs (e.g. fencing or signage) can be used to protect a feature's biological integrity. These should be evaluated based on the specific feature and the location of that feature with respect to construction activities on a case by case basis. Additional modifications or BMPs should also be considered such as:

- Modifying the highway alignment or bridging over a sensitive feature. For example, the DEIS alignment was modified in order to minimize impacts to Flint Ridge Cave. The preferred alternative would impact Feature #55, requiring a bottomless culvert which, bridged over the feature, would maintain recharge potential (the feature is located along the bottom of a minor drainage channel). Hat Sink, feature #23, would also be impacted because approximately 0.13 acre of its approximately 1.194-acre surface drainage basin would be intersected by the proposed roadway. Surface grading would allow surface flow to be captured on an adjacent, equivalently sized area to compensate for the lost catchment. Surface flow to Hat Sink would be conveyed under the roadway via culverts, and natural buffers would be established surrounding the openings to both the feature and the culvert.

- In addition to the natural buffer guidelines mentioned above, TCEQ recommends that in the case of caves, natural buffers should extend at least 50 feet in all directions from the cave's footprint, and may extend further based on drainage area. In this case, the footprint is defined as the plan-view or horizontal map of the cave, projected up to the surface to show the areas underlain by the cave passage (TCEQ, 2012). For currently designed sensitive feature buffers, factors such as drainage basin morphology and up-gradient site conditions were used to determine buffer extent. See **Attachment 3: Sensitive Feature Protective Measures and Drainage Sheets.**

- Caves within the state-owned ROW would be gated. Gates would be constructed as to not impede the natural passage of air, water, organic material, and cave dependent

species. Gate construction would follow Section 2.3.1 TCEQ (2007a) for proper fit, natural and maintenance access, and protection.

- A high service rock berm and silt fence or mulch sock could be placed around the cave entrance. If the cave opening or other sensitive feature is down-gradient of a disturbed area, utilizing a series of BMPs in a concentric pattern around the cave opening or sensitive feature may function as secondary or tertiary containment of sediments and debris (American Rivers, 2013). Other construction BMPs designed to contain sediment such as a sediment basin could be used when there is potential for a larger disturbed area upstream from the feature.

- If needed, runoff control BMPs such as perimeter berms should be constructed that are designed to divert any construction or highway runoff away from cave openings or sensitive features to an appropriate containment BMP. Depending on location and highway alignment, these features can be designed and constructed as permanent BMPs.

Examples of overall efficiency of construction BMPs used in series was discussed above. Additional calculations should be performed to evaluate particular sediment control BMPs during final highway design based on the Geologic Assessment. However, as previously mentioned, the successful implementation and monitoring by the onsite ECM including routine inspections and repair or adjustment of installed BMPs is critical to their success (COA, 2013 and TCEQ, 2005).

A.3.2.3 Post-construction Water Quality Protection BMPs

In addition to highway runoff treatment BMPs (discussed below), post-construction BMPs specifically protective of groundwater are required over portions of the Edwards Aquifer (30 TAC 213). As previously discussed, installation of some construction-phase BMPs could be utilized as permanent BMPs given proper planning and if appropriate site conditions exist. Each sensitive feature would have to be evaluated to determine whether a control is needed and the extent of that control. These are being evaluated based upon the completed Geologic Assessment and may be modified during final design. In addition to engineered BMPs, when practicable, maintaining or re-establishing buffer zones of natural vegetation around sensitive features is desirable to retain and filter runoff as well as preserve habitat (USFWS, 2007).

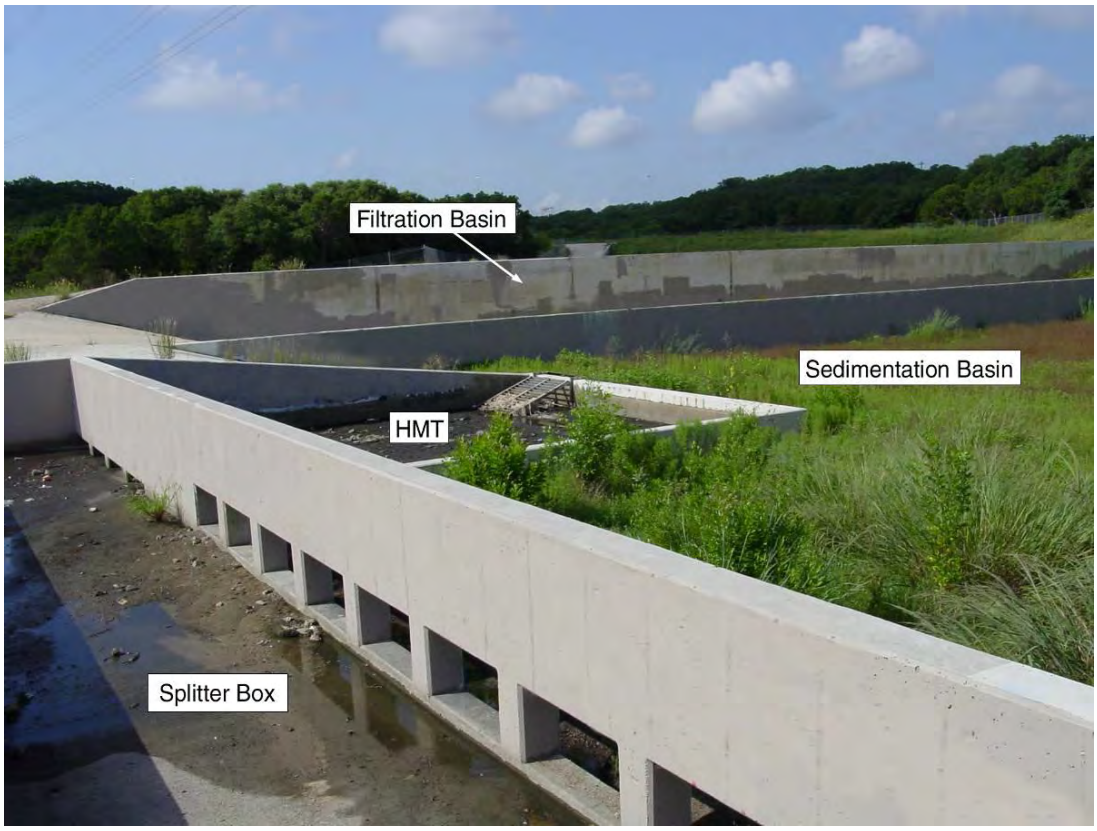
A.3.3 Hazardous Materials Traps

The TCEQ (2007a) states that roadways across the EARZ capable of conveying at least 25,000 vehicles per day must include a hazardous material trap (HMT) designed to retain a spill of 10,000 gallons of liquid hazardous material (TCEQ, 2007a). This control measure is designed to prevent vehicles carrying hazardous materials, as well as petroleum products used in passenger vehicles from potentially impacting and contaminating surface or groundwater in the event of an accident. HMTs can include:

- Trapping catch-basins;
- Catch-basin inserts;
- Lined detention basins;
- Proprietary BMPs such as oil/water separators and end of pipe controls (Stormceptor, Vortechs, etc.); and
- TxDOT HMTs with siphons.

Some of these HMTs can be sited within the footprint of certain BMPs such as water quality ponds without increasing the footprint needed. TxDOT developed a siphon as an added safety measure which allows for draining the trap of water after a rain event. This configuration and others like it reduce the likelihood of hazardous material detainment failure due to trap volume exceedance, as can happen during rain events or during spill cleanup (TCEQ, 2007a). Mahler et al. (2005) summarized available HMTs and discussed their usage for spill containment. They noted that while many HMTs are designed to use oil/water separators as the primary HMT, this would be effective for only about 40 percent of spills and most are not designed to contain large amounts of spilled liquids (Mahler et al., 2005). HMTs would be an integral part of the final design of the proposed SH 45SW. They would be included in the design of each of the newly constructed water quality ponds, and would be available to detain possible spills from the majority of the proposed roadway. An example of a TxDOT-designed HMT inside a sand filter is shown below in **Photo A.3-1**.

Photo A.3-1: Typical HMT in Sand Filter



Source: TCEQ, 2007a

A.3.4 Groundwater Monitoring

The Barton Springs Edwards Aquifer District (BSEACD) has conducted aquifer-wide sampling of groundwater sites annually since 1998, as part of an ongoing partnership with the Texas Water Development Board (TWDB) (BSEACD, 2009). This effort monitors water quality by collecting samples from wells completed within the Edwards and related aquifers as well as collecting samples from springs in the area. The samples are analyzed for major constituents as well as dissolved metals and nutrients. These data are used to characterize groundwater trends over time and to provide a foundation for hydrogeologic investigations and evaluations of water resources in central Texas (BSEACD, 2009). While groundwater monitoring is not a BMP, it could be used to assess potential impacts to water quality in the study area during and post-construction. Groundwater monitoring is currently being used by BSEACD to monitor the effectiveness of a recharge BMP on Onion Creek (Smith, 2011).

A.4 Best Management Practices to Address Post-construction Water Quality

The historical approach to stormwater management for highway design has been to collect and convey stormwater through swales or pipes to a centralized end-of-pipe discharge point or treatment system (NCHRP, 2006). As previously mentioned, BMPs are generally selected based on a presumptive water quality control characteristic (e.g. remove 80 percent of total suspended solids or capture 80 percent of the two-year, 24-hour storm). The standard to remove 80 percent of the incremental increase in TSS represents the minimum requirement (30 TAC 213) for development over portions of the Edwards Aquifer, but additional protection of water quality and quantity is desired in the interest of greater protection for aquatic resources (USFWS, 2005). **Table A.4-1** below shows accepted efficiencies for TCEQ-approved BMPs.

Table A.4-1: Efficiencies for TCEQ-approved BMPs

BMP	TSS Reduction (%)
Retention/Irrigation	100
Aqualogic™ Cartridge Filter System	95
Wet Basin	93
Batch Detention Basin	91
Permeable Friction Course	90
Constructed Wetland	89
Sand Filter	89
Bioretention	89
Vegetative Filter Strip	85
Extended Detention Basin	75
Grassy Swale	70

Source: TCEQ (2005, 2009, 2012)

These values represent demonstrated effectiveness provided specific design criteria and site specific conditions are met (TCEQ, 2005). However, traditional BMPs are now being supplemented or replaced with a more distributed approach known as low impact development (LID) designed to reduce runoff and associated pollutants by incorporating a range of both natural and constructed treatments (NCHRP, 2006). LID is an innovative land use and engineering design approach with the goal of maintaining and enhancing the pre-development hydrologic regime of the area (EPA, 2013). This advanced stormwater design approach considers hydrologic source control and runoff reduction in the initial project planning phase to reduce or eliminate stormwater runoff (NRDC, 2013). For example, permeable friction course (PFC) is a design BMP which acts as both a hydrologic source control and water quality treatment. Other structural BMPs work with nature to reduce and manage stormwater as close to its source as practicable using vegetation and small scale treatment systems to achieve water quality goals (American Rivers, 2013; USFWS, 2007). In addition, non-structural BMPs

can enhance effectiveness of structural BMPs and attenuate or eliminate pollutants in the environment (American Rivers, 2013). Post-construction programs are most effective when they incorporate LID design during initial project planning utilizing innovative BMPs and the "treatment train" or BMPs in series approach that protect water quality and control runoff (EPA, 2000).

This section will discuss both innovative and standard BMPs used to control and treat stormwater runoff, provide a description and example of each BMP and provide summary data, where applicable. As previously mentioned, the International BMP Database, (http://www.bmpdatabase.org/) is a searchable database providing a useful tool by demonstrating variations in effectiveness and specific pollutant removal efficiency based on type of BMP or site conditions.

A.4.1 Innovative or "Green" Structural BMPs

Innovative BMPs/LID can be divided into structural and non-structural controls. Examples of structural source controls include:

- Retention/irrigation systems;
- Permeable pavement and PFC;
- Bioretention basins or rain gardens;
- Vegetative filter strips (VFS); and
- Alum injection treatment.

Examples of non-structural BMPs/LID are:

- Comprehensive site planning;
- Preservation of natural runoff conditions;
- Pesticide and fertilizer management;
- Housekeeping practices, including educational programs;
- Landscaping and vegetative practices; and
- Preserving riparian corridors.

These "green", or innovative BMPs, are discussed below and data as to their effectiveness in removing pollutants commonly associated with highway runoff is presented in **Table A.4-2**. The Central Texas Regional Mobility Authority (CTRMA) sponsored a Green Mobility Challenge intended to identify potential innovative design components and sustainable initiatives. Some of the concepts identified in the competition may be incorporated into the final design of SH 45SW.

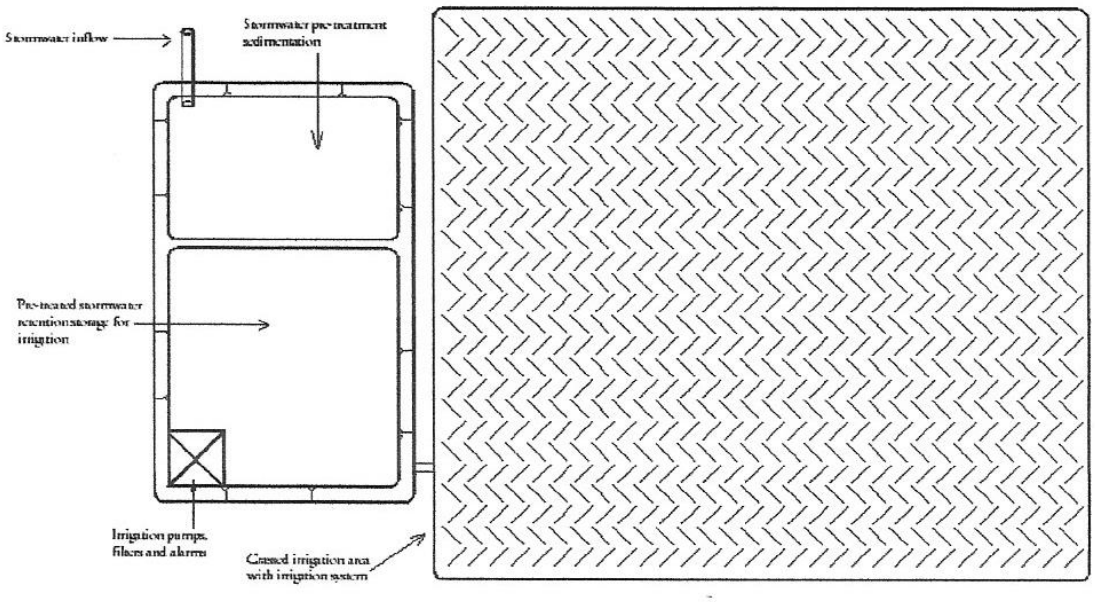
A.4.1.1 Retention/Irrigation Systems

Retention/irrigation systems represent an aggressive and highly effective stormwater treatment BMP (CASQA, 2004). Stormwater retention and use of impounded water for irrigation

purposes has the highest TSS removal efficiency (TCEQ, 2005; COA, 2013) and also serves as a water conservation measure in that collected water can be used for irrigation. This technology emphasizes beneficial use of stormwater runoff and could provide for upland recharge to the aquifer. This is especially critical because of increasing demands on groundwater supplies for irrigation, urban demand and spring flow maintenance (USFWS, 2005).

These systems consist of primarily two components, a basin for retaining runoff and a system for distributing the stored water. Capture of the runoff can be accomplished using dry concrete-lined ponds or vegetated basins. A schematic showing the general layout of a retention/irrigation system is presented in **Figure A.4-1**.

Figure A.4-1: Retention/Irrigation System



Source: CASQA, 2004

Retention/irrigation systems have demonstrated an ability to remove 100 percent of TSS (TCEQ, 2005) and up to 73 percent Cu, 76 percent Zn, 79 percent NO_3, and up to 97 percent bacteria (NPRD, 2007). However, their high maintenance requirements/costs and inconsistent results on projects larger than a single tract make their use on linear projects problematic. Additionally, these systems have large space requirements due to the need for sufficient area for the dispersal of irrigated water. The systems are designed to capture and retain a target volume of runoff calculated to be generated under specific site conditions. Data and specific conditions under which the data was collected can be found in the BMP Database (Winer, 2000). Because of the high maintenance costs and large space requirements, these BMPs would not be considered viable for use in the proposed SH 45SW project.

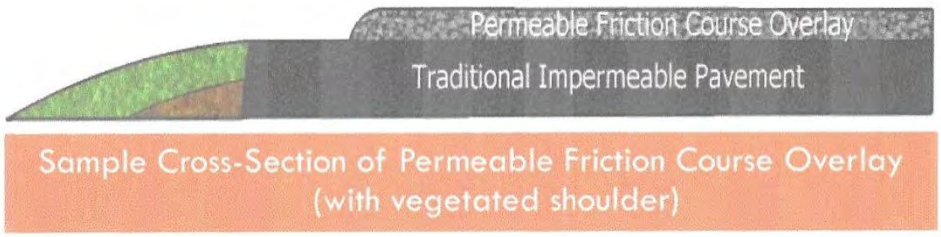
A.4.1.2 Permeable Pavements

Permeable pavement is an alternative to conventional paving materials and allows stormwater to infiltrate through void spaces for temporary storage before infiltrating into the subsurface. Pavement can be designed for infiltration or detention then diversion to treatment area. Studies report permeable pavement designed for infiltration had pollutant removal rates of 85 percent for TSS, 30 percent for total Nitrogen (TN) and 60 percent for total Phosphorus (TP), and pavement designed for detention had pollutant removal rates of 70 to 85 percent TSS, 10 percent TN and 10 percent TP (NCDENR, 2012). These pavements can reduce pollutant loading and the volume associated with runoff and therefore reduces the land needed to achieve water quality treatment goals; however, proper maintenance is needed to prevent clogging with sediments which could compromise effectiveness. The majority of studies evaluating the effectiveness of permeable pavements are those designed for low vehicular use, such as parking lots, pedestrian use, bike paths or other low impact areas. Permeable pavement for non-pedestrian use should have an impermeable liner which would drain the water to an approved water quality control BMP (COA, 2013) such as grassy vegetative swales. An example of permeable pavement with an impermeable liner is PFC, discussed below.

A.4.1.2.1 Permeable Friction Course (PFC) Pavement

PFC is a porous asphalt overlay that is applied over conventional concrete or asphaltic pavements. The pavement operates as a hydrologic source control in that during rain events, water is conveyed along the boundary with the underlying impervious pavement and discharged at the edge of the roadway where it can be diverted to a treatment area. A general schematic view of PFC is presented in **Figure A.4-2**.

Figure A.4-2: PFC Asphalt Overlay Schematic



Source: Braga et al, 2011

In 2011, PFC was being used in 19 states and being tested in eight states for highway safety (Klenzendorf et al, 2011). Recent research has evaluated PFC for its role in improving water quality of highway runoff due to filtration through the PFC as well as reduction of splash which washes pollutants from vehicles (Barrett and Stanard, 2008; TCEQ, 2012). The water quality advantages of PFC are that surface sheet flow is reduced and recent study data indicate

that PFC can remove from 90 percent (TCEQ, 2005) up to 96 percent of TSS in highway runoff (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008). Comparison of runoff from traditional asphalt with VFS and PFC indicated that water quality from PFC alone was better than that of traditional asphalt and VFS (Barrett and Shaw, 2006). In addition, PFC has been measured to reduce traffic noise levels by three decibels (dBAs) over conventional asphaltic pavement (Arambula et al., 2013 and Trevino-Frias and Dossey, 2007). Construction information and PFC project considerations can be found in Arambula et al., 2013 and TxDOT specific PFC criteria are specified in Item 342 of the TxDOT Construction Manual (TXDOT, 2014a) (http://ftp.dot.state.tx.us/pub/txdot-info/des/specs/specbook.pdf).

Using the efficiency data and equation for BMPs installed in a series provided by TCEQ (2009), PFC (90 percent) used in conjunction with VFS discussed below (85 percent) results in the following combined efficiency:

$E_{tot} = [1 – (1-E_1)(1-0.65E_2)] \times 100$

Where $E_1 = 0.90$ and $E_2 = 0.85$

This series yields a TSS removal efficiency of 96 percent.

Data associated with some of the studies performed on PFC to evaluate water quality are presented in **Table A.4-2**.

PFC pavement is appropriate for the SH 45SW corridor, and would be carried forward into design. Current proposed designs include PFC on the majority of the roadway (with the exception of bridged sections and the Shared Use Path) as an integral part of the stormwater treatment system.

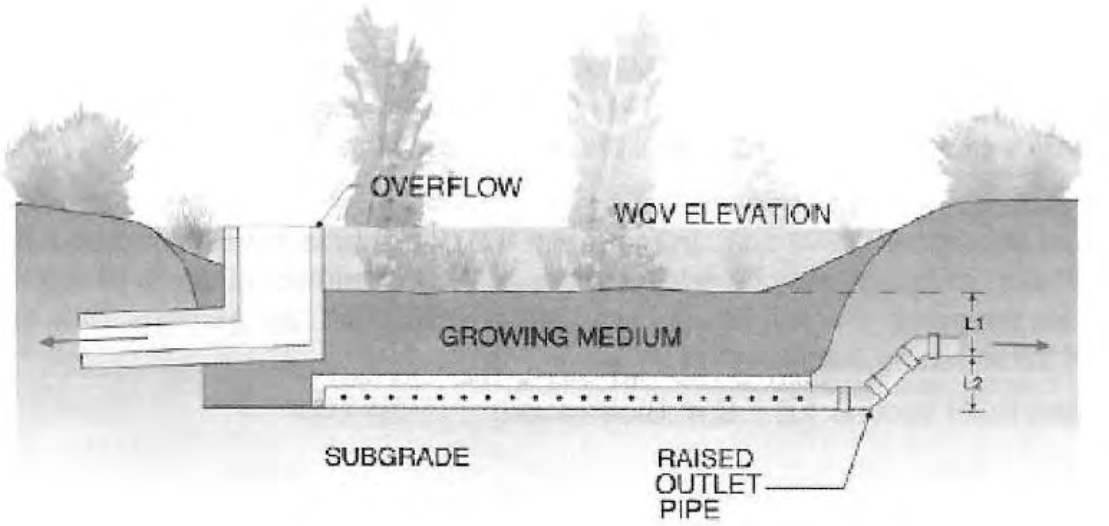
A.4.1.3 Bioretention areas (rain gardens and constructed wetlands)

Bioretention areas are shallow basins in which stormwater runoff is treated through chemical, microbial, and mechanical processes as the water filters through the soil matrix and around the root zones of plants (COA, 2013). There is uptake of pollutants and storage of water as well as infiltration into native sediments. The intent is to create an engineered terrestrial ecosystem which has aesthetic value as well as functions as an effective pollutant remover (Davis et al., 2011). Examples of bioretention areas are rain gardens and constructed wetlands.

A rain garden is a vegetated, depressed landscape area designed to capture, infiltrate, and/or filter stormwater runoff. Rain gardens provide removal of pollutants similar to other biofiltration and treatment systems but because their design provides more surface area and a shallower depth, biological uptake may be more significant than for other systems (COA, 2013). Rain gardens are appropriate for areas with drainage basins of less than two acres and may be dispersed across an area unlike conventional treatment systems. An example of a partial

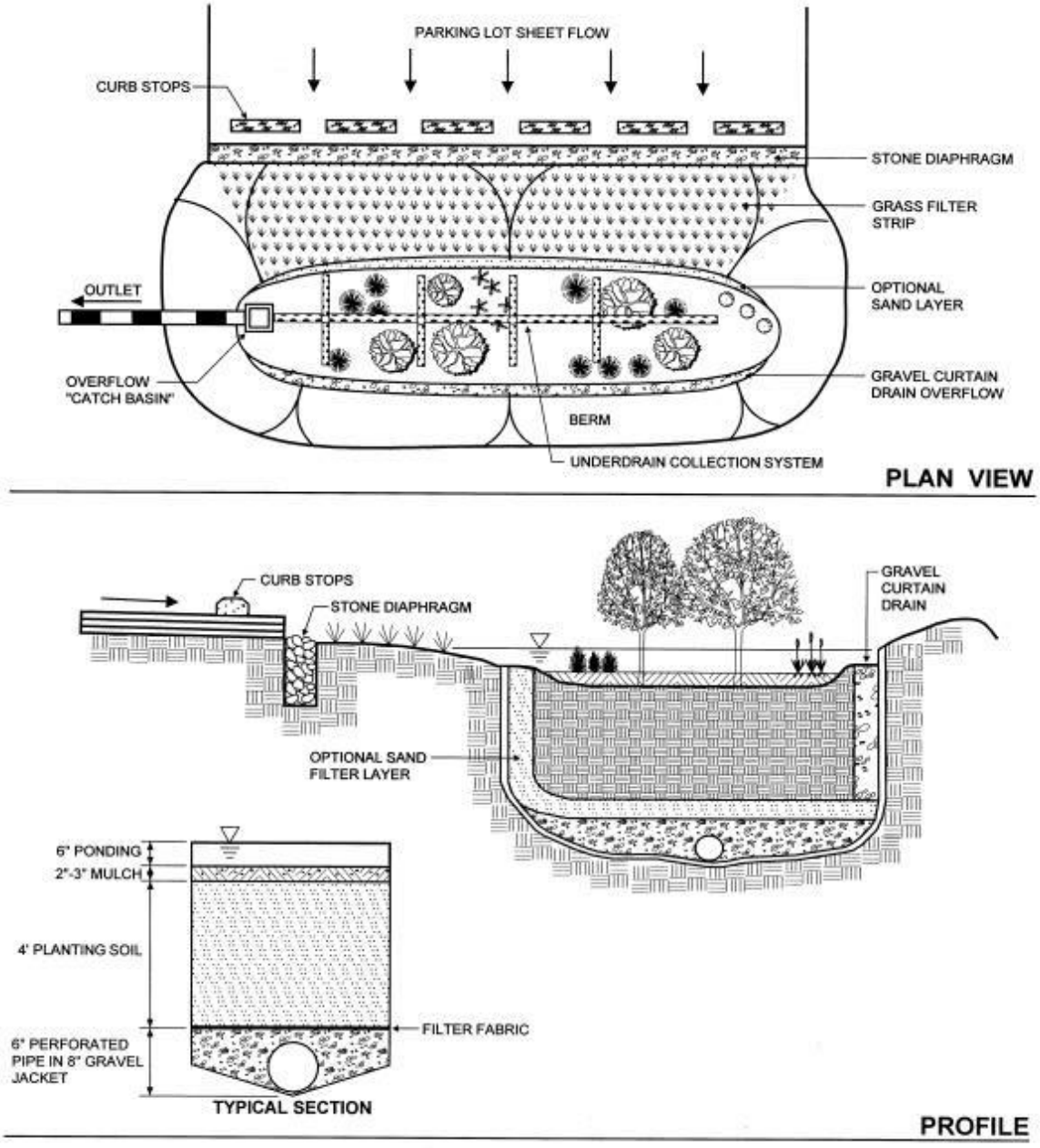
infiltration rain garden and a rain garden in a parking lot are shown in **Figure A.4-3** and **Figure A.4-4**.

Figure A.4-3: Partial Infiltration Rain Garden



Source: COA, 2013

Figure A.4-4: Rain Garden in Parking Lot



Source: TCEQ, 2005

These designs allow for capture and treatment of stormwater where runoff is conveyed through an outlet pipe as well as infiltrating into the soil. The COA ECM gives criteria, calculations and considerations for siting rain gardens. These criteria may have limiting factors within the proposed project area given depth to bedrock and soil permeability and would be evaluated using site specific data based on the Geologic Assessment findings. An appropriate list of native or adapted plants suitable for incorporating into rain gardens is available at

http://austintexas.gov/sites/default/files/files/Watershed/lesson_plans/aisd_rain_gardens/rain_garden_plants.pdf).

The effectiveness for removing pollutants varies depending on the contaminants, garden design and the vegetation. Most current applications of rain gardens are in association with treatment of parking lot and residential runoff and their applicability to large construction projects such as SH 45SW is unknown. In these settings, rain gardens have demonstrated removal of TSS at up to 71 percent, TP up to 94 percent, NO3 up to 86 percent, and copper, lead and zinc up to 70 percent, 97 percent, and 72 percent, respectively (Davis et al, 2011). Other studies have shown rain gardens to remove phosphorous at 50-65 percent (VADPW, 2001).

Constructed wetland systems which utilize native vegetation and create wildlife habitat while treating water are growing in popularity. They provide physical, chemical and biological water quality treatment. They are widely utilized to treat wastewater and are especially effective in removing nutrients (Tillman et al, 2013). In varying applications, constructed wetlands have demonstrated removal of TSS at up to 66 percent, TP at 55 percent, TN at 40 percent, NO3 at 32 percent and copper and zinc at six percent and 57 percent, respectively, and oil and grease at 15 percent (Johnson et al, 2007). Other studies have shown constructed wetlands to remove TSS at 65 percent, TP at 25 percent, TN at 30 percent and metals ranging from 35-65 percent (EPA, 1993; FHWA, 2000). Constructed wetlands differ from a rain garden in that a continuous base flow must be maintained. Given this criteria, use of standard constructed wetlands within the proposed project area may not be appropriate.

The International BMP Database (http://www.bmpdatabase.org/) contains numerous data on existing bioretention areas and the efficacy of pollutant removal, especially data regarding removal of nutrients and metals.

Rain gardens would not be carried forward for consideration in the proposed SH 45SW primarily due to sizing requirements, and the need for excavation which could conflict with cave or karst features. However, several BMPs discussed below function under similar principles, and some of these will be carried forward for consideration.

Constructed wetlands would not be carried forward for consideration in the proposed SH 45SW primarily due to the BMP's hydrologic requirements and the incompatibility of those requirements with regional weather patterns.

A.4.1.4 Vegetative Buffers (grass swales and vegetative filter strips)

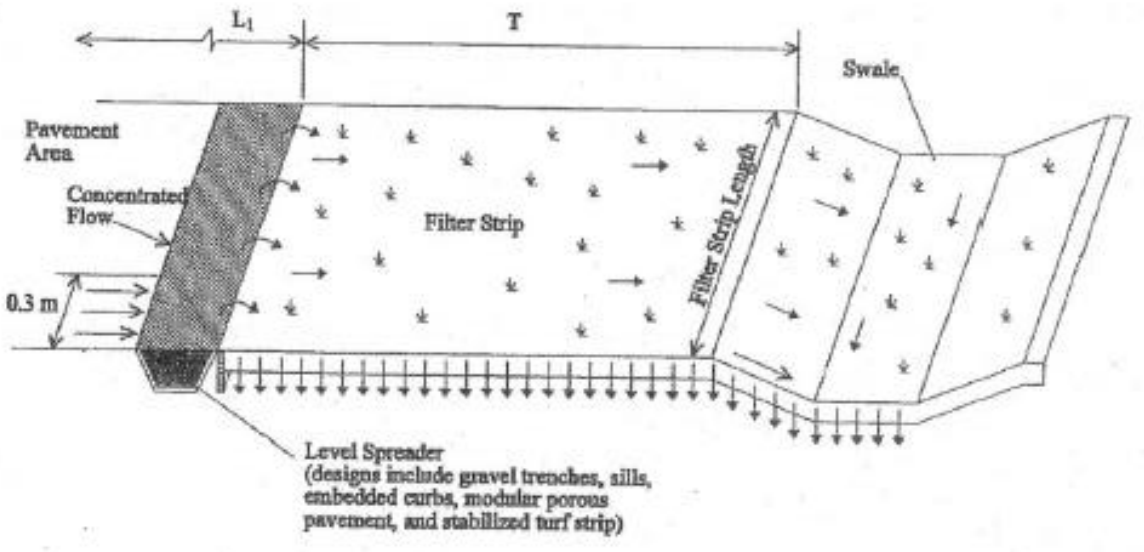
The use of vegetative buffer areas along roads, streets and highways often installed for typical highway applications of drainage, safety and aesthetic purposes have been shown to be effective as filtration BMPs for highway runoff (Storey, 2009). Currently, over 50 percent of DOTs encourage use of vegetative BMPs for use as primary stormwater treatment (Storey, 2009). The effectiveness of vegetative buffers as a BMP for treating highway runoff has been

extensively studied and represents a promising green/innovative alternative to traditional BMPs (NCHRP, 2006).

Vegetative buffers consist of VFS and grassy swales. VFS are not channels but relatively smooth, vegetated areas that accept highway runoff as sheet flow. These differ from bioretention or rain garden areas in that the planting medium is typically native soil and may be an undisturbed native buffer or an engineered vegetative strip designed to maximize water quality benefits and control and direct flow. VFS function by decreasing runoff velocity and spreading overland flow thus increasing filtration area. Grassy swales are shallow, grass-lined flat bottomed channels engineered to convey stormwater at moderate slopes. Treatment occurs as water flows down the swale. VFS and grassy swales can be used in conjunction with each other and designed to convey runoff through the use of slope and/or underground piping. Both VFS and grassy swales function to remove constituents by vegetative filtration, sedimentation, soil infiltration, and biological activity in the grass/soil media (Walsh et al, 1997).

Design criteria and site selection considerations for natural and engineered VFS with information on flow volumes, slopes, and vegetation density are included in TCEQ (2005). A cross-section showing an example of an engineered VFS utilizing a level spreader for flow distribution and paired with a grassy swale is presented in **Figure A.4-5**.

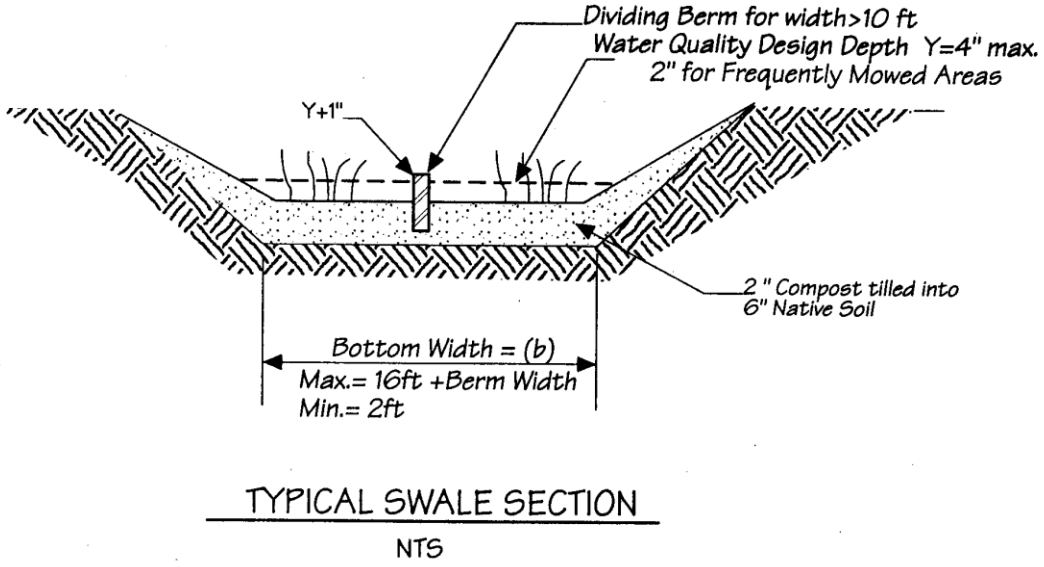
Figure A.4-5: VFS using Level Spreader for Flow Distribution



Source: TxDOT, 2004a

Figure A.4-6, taken from TCEQ (2005), illustrates the cross section of a grassy swale designed for capture and conveyance of stormwater runoff.

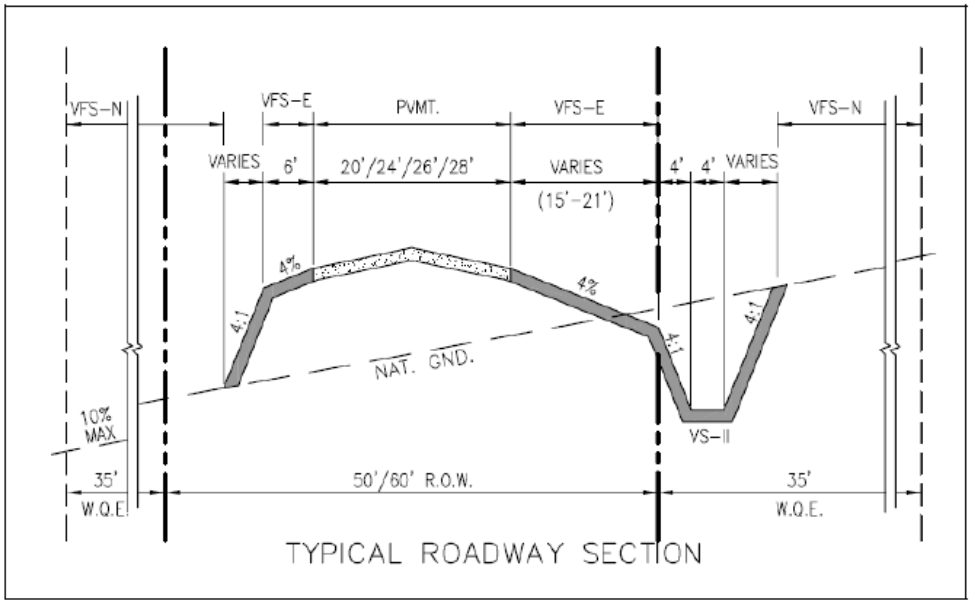
Figure A.4-6: Grassy Swale for Capturing and Conveying Stormwater Runoff



Design specifications and calculations for constructing grassy swales are presented in Section 3.4.5 of the TCEQ (TCEQ, 2005). The *Stormwater Menu of BMPs* states that properly sized and designed grassy swales can be used to meet groundwater recharge and pollutant removal goals (EPA, 2000).

Figure A.4-7 illustrates VFS used in conjunction with a grassy swale, designated as VS in the diagram.

Figure A.4-7: VFS and Grassy Swale

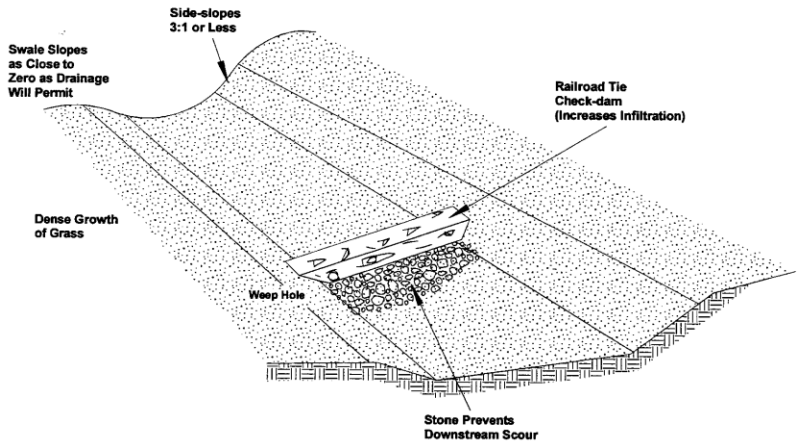


Source: TCEQ, 2005

Storey et al. (2009) researched road construction and stormwater BMP practices of DOTs for numerous states and evaluated the effectiveness of vegetative buffers designed for typical highway applications, not specifically for stormwater treatment. The results of this extensive survey reported that standard roadside design can often meet water quality goals for stormwater treatment. In some instances, the use of VFS alone is sufficient to achieve the 80 percent removal standard for a project's incremental increase in TSS. Data also indicate that proper use of vegetative buffers can show a "no net increase" in stormwater runoff (Storey, 2009). Several studies performed on VFS not specifically designed for water quality indicated that VFS can function as an effective water quality control BMP (FHWA, 2000). VFS have been shown to remove up to 97 percent of TSS and up to 99 percent of metals (Barrett, 2004).

These results indicate that vegetative buffers are a promising and innovative LID solution to managing highway runoff in an environmentally sensitive area (Barrett, 1995c). Various site specific criteria (soil type, vegetation, climate, and maintenance) should be given careful consideration with respect to selection of an appropriate vegetative BMP. For example, data indicate sides of highways are better than center strip medians for treatment of pollutants provided specific criteria are met and TSS removal was higher during the growing season likely due to density of vegetation for capture (Walsh et al., 1997). Stagge and Davis (2006) demonstrated comparable water quality improvement, TSS removal of 65-70 percent and zinc 30-60 percent, along highways due to vegetative strips. This study also indicated that under certain flow conditions, using rock/check dams may increase vegetative buffer efficiency. A schematic of a grassy swale with a rock/check dam is presented in **Figure A.4-8**.

Figure A.4-8: Grassy Swale with Rock/Check Dam



Source: Schueler, 1987.

Source: TCEQ, 2005

Often used for rural roadsides or highways, a combination of filter strips and grassy swales can increase the pollutant removal and volume capacity (Storey, 2009). These data demonstrate performance within a lesser treatment distance than most agencies require, thus limiting impacted surface area (Barrett, 1995a).

One potential drawback of VFS is that sufficient rainfall is often needed to maintain the vegetation in order to ensure success. Studies have shown that VFS are most effective with at least 80 percent vegetation ground coverage (Walsh et al, 1997). Vegetative composition has also been found to have a significant impact on the effectiveness of VFS pollutant removal, with grasses being more effective than shrubs or wooded areas (Glick et al, 1993, Thuesen, 2013). Highways in the Austin area are currently planted with native grasses and wildflowers which, once established, can thrive with no supplemental water. These VFS have demonstrated that sufficient vegetation can be maintained and is effective at reducing common pollutants associated with highway stormwater runoff (Walsh et al, 1997). The Walsh report also looked at the bioaccumulation of metals in VFS sediments because of concern over potential phyto-uptake and subsequent effects on the food chain. The study found loading of metals in sediments could be an issue but under most of the conditions evaluated, natural attenuation in the soil mitigates potential impacts to groundwater (Barrett, 1995b). Utilizing existing EPA regulations regarding metals accumulation in sediments, Walsh concluded that when applied to BMPs, there are no adverse effects from highway runoff on the environment for at least 200 years (Walsh et al, 1997).

The data collected during various VFS studies and presented in **Table A.5-1** indicates a high variability in vegetative buffer effectiveness. This variability can be attributed to factors such as design (length and slope), vegetative density, soil type, storm volume as well as influent concentration loads (Storey, 2009). Of these various factors, slope length and design appear to have the greatest effect on removal efficiencies (Walsh, 1997). Pollutant load reductions are typically calculated as:

$$R = \frac{(L_H - L_F) \times 100\text{percent}}{L_H}$$

Where:

R= reduction in pollutant load in percent

L_H = annual pollutant load if runoff not treated in kg/yr

L_F = annual pollutant load if runoff treated by vegetative buffer

These calculations are discussed in more detail by Walsh et al, 1997.

Vegetative buffers would be carried forward for consideration for use in the proposed SH 45SW. These BMPs would have particular applicability in several areas including roadside

shoulders and sensitive feature buffers. Given the TSS removal, cost, and maintenance of these BMPs, they would be an integral part of the proposed stormwater treatment system.

Data related to specific studies for bioretention and VFS are presented below in **Section A.4.3** in **Table A.4-1**.

A.4.1.5 Alum Treatment

Alum treatment has been used as an innovative BMP to treat urban runoff as part of a lake restoration program in Florida since 1986 (Harper and Herr, 2000). Liquid alum is injected into major storm sewer lines during significant rain events where it forms non-toxic precipitates by combining with common stormwater pollutants and sediments causing them to be rapidly removed. Alum injection can treat large volumes of runoff within a small footprint and the flocculent formed is nontoxic (FHWA, 2013). Removal efficiencies are similar to that of detention ponds. Alum treatment has been effective at removing >95 percent TSS, >90 percent TP, 40-70 percent TN, and 60 percent BOD (Harper and Herr, 2000). Additional data are presented in **Table A.5-1**. Alum injection may be an effective treatment option when used in conjunction with other BMPs to remove dissolved constituents or nutrients that may not be effectively removed using other BMPs.

Many of the innovative BMPs discussed above are evolving into standard practice and designers/engineers should inquire about updates and/or variations to the practices currently approved. TCEQ has developed criteria for evaluation and use of innovative BMPs. The procedure is discussed in Chapter 4 of the Edwards Aquifer Rules (TCEQ, 2005).

Alum treatment is not currently widely accepted for use as a stormwater treatment BMP in central Texas. Given the sensitivity of groundwater resources in the area, the lack of data related to biotoxicity, and the availability of equally effective and less maintenance intensive options, alum treatment would not be carried forward for consideration in the proposed SH 45SW project.

A.4.2 Non-Structural BMPs

Various non-structural BMPs are currently being utilized and evaluated with respect to their impact on water quality and quantity (NRDC, 2011). Many of these practices represent examples of common sense and good stewardship (TCEQ, 2005). Given the environmentally sensitive nature of the study area, advanced planning, public awareness, education, and other types of non-structural BMPs can be effective tools at reducing potential impacts to water quality from pollution. EPA recognizes non-structural BMPs as a critical component of NPDES compliance (EPA, 2000). The COA ECM also provides information and guidance on the use of non-structural BMPs as well as criteria for handling certain potential pollutants such as pesticides and fertilizers over the Barton Springs Recharge Zone. These non-structural BMPs include, but are not limited to;

- Comprehensive Site Planning;
- Preserving Natural Runoff Conditions;
- Pesticide and Fertilizer Management;
- Housekeeping Practices;
- Landscaping and Vegetative Practices;
- Preservation of Riparian Corridors; and
- Street Sweeping.

A.4.2.1 Comprehensive Site Planning

As previously discussed, preventing problems is easier than solving them. Use of LID when developing new projects should incorporate structural and non-structural BMPs including source controls and a stormwater management system (EPA, 2013). Principles used to develop a site plan were discussed in **Section A.2** and can be found in TCEQ (TCEQ, 2005).

A.4.2.2 Preserving Natural Runoff Conditions

Minimizing impervious area and disruption to natural drainage by using LID to preserve the hydraulic character of the area to mimic pre-construction conditions utilizes the natural ecosystem to provide water quality enhancement (American Rivers, 2013; EPA, 2013).

A.4.2.3 Pesticide and Fertilizer Management

Herbicides, pesticides and fungicides are commonly used lawn and garden chemicals that are often poisonous/toxic. Many have been shown to negatively impact aquatic life (USFWS, 2007). The impact to water quality from household and urban applications of these chemicals is difficult to evaluate and therefore quantitative data to demonstrate the effectiveness of non-structural BMPs on reduction of these chemicals is limited. Integrated pest management (IPM) is an ecological approach to pest management utilizing organic gardening techniques integrating mechanical, biological and chemical controls for pest management (TCEQ, 2005). Organic gardening techniques can reduce or eliminate fertilizer use and therefore reduce nutrient impacts on surface and groundwater. Additional resources on IPM and other LID approaches to vegetative management can be found at the Ladybird Johnson Wildflower Research Center website (http://www.wildflower.org) and the COA WPD website (http://austintexas.gov/department/watershed-protection/education). TxDOT would use minimal fertilizers and prohibit pesticide usage within the SH 45SW ROW.

A.4.2.4 Housekeeping Practices

Public awareness of environmental issues within the study area is vital to achieve acceptance of the need for incorporating practices that reduce sources of pollutants in watershed runoff. Incorporating these practices can have a cumulative effect on reducing total pollutants reaching surface and groundwater thus preserving and improving the water quality in the Edwards Aquifer and at Barton Springs. Examples of good housekeeping practices include litter and sediment removal by mechanical means, detecting and reducing illicit dumping of pollutants (education can factor into this), proper handling, use, and disposal of lawn and garden chemicals as well as other household chemicals and proper solid waste management. The COA WPD has established educational programs and community outreach as well as literature that address many of these issues (http://austintexas.gov/department/watershed-protection/education).

A.4.2.5 Landscaping and Vegetative Practices

Vegetation provides several advantages in stormwater management. It can assist in controlling the quantity and quality of runoff by slowing velocities, thereby increasing infiltration. Vegetative controls such as VFS and rain gardens, as previously mentioned, are effective water quality pretreatment methods especially when used as part of the stormwater treatment train (Barrett et al, 1998). Some of the benefits are: reduction of runoff velocity which aides in retention and infiltration and slows erosion, creation of wildlife habitat, mechanical and biological removal of sediments and pollutants, and aesthetic improvements such as preserving trees and natural areas. Removal of non-native and invasive vegetation during construction activities can allow for the re-establishment of native vegetation, thus assisting in and potentially improving the water quality and quantity at Barton Springs (Thuesen, 2013). Use of VFS and other bioretention BMPs have demonstrated effectiveness as structural controls (Storey et al, 2009).

A.4.2.6 Preservation of Riparian Corridors

Preserving existing riparian corridors would provide aesthetic locations for placement of structural BMPs, assist in pollutant removal, assist in erosion as well as flood control, and aide in managing/eliminating small drainage problems and stream channel widening. These corridors also provide wildlife habitat and can be incorporated into recreational areas, such as hike and bike trails (such as the Violet Crown Trail).

A.4.2.7 Street Sweeping

In a study conducted by Irish and others (1995), street sweeping was found to significantly reduce TSS and VSS loads in stormwater. The report recommended sweeping scheduled after any event that deposits a large amount of sediment on the roadway and possibly after rain events. Other studies have shown varying success with street sweepers.

Curtis (2002) reported that sweeper type had a substantial effect on efficiency with vacuum filter sweepers out performing other types. Smith (2002) reported that removal efficiency by sweeper type varied with particle size. Larger particles were removed by mechanical brush-type sweepers while vacuum sweepers were more effective at removing smaller particles.

A.4.3 Permanent Structural BMPs

TCEQ identifies BMPs appropriate for use over the Edwards Aquifer and provides TSS removal efficiencies (see **Table A.4-1** below). As a minimum, selected BMPs individually, or in a series, must reduce the incremental increase in TSS associated with new development by 80 percent (30 TAC 213.5; TCEQ, 2005). TCEQ Edwards Aquifer Rules establishes design criteria and methodology for construction, implementation, and maintenance of these BMPs to ensure long-term performance of the BMP. COA also provides criteria and design specifications for certain BMPs. The BMP selection process discussed in **Section A.2.1** would assist in identifying appropriate controls to meet site specific characteristics. As previously discussed the applicability of a particular BMP is dependent upon site specific conditions and degree of stormwater retention and treatment. The actual removal efficiency would vary somewhat based upon site characteristics and BMP design calculations and whether the BMP is utilized as a standalone control or in series.

Retention/irrigation systems, grassy swales, VFS, constructed wetlands, bioretention, and permeable concrete/PFC were discussed in the Innovative BMP section above. Several additional structural BMPs are discussed below including a variety of water quality ponds. An important consideration in this discussion is the ability for individual BMPs to incorporate functionality from several types of BMPs in one unit. A previously discussed example is the HMT functionality designed into a water quality pond. In a general sense, water quality ponds would be carried forward for consideration for use in the proposed SH 45SW. Design specifications would be selected during final design after giving consideration to water quality improvement capabilities, sizing constraints, and overall functionality. An example of these considerations is provided by **Table A.4-2** below, which is modified from a table presented by TCEQ (2005).

Table A.4-2: Summary of Permanent Structural BMPS and Potential TSS Removal Efficiencies

Permanent Structural BMP	TSS Removal Efficiency (%)	Drainage Area Limit		Slope Range/Limitation		Amount of Land Required	Maintenance Requirements
		Small (<10 ac)	Large (10+ ac)	2-6%	20% or less		
Retention/ Irrigation	100		✓	✓		Large (irrigation)	High
Extended Detention Basin	75		✓ *	✓		Moderate	Low to Moderate
Grassy Swale	70	✓		✓		Moderate to Large	Low to Moderate
Vegetative Filter Strips	85	✓			✓	Moderate to Large	Low
Sand Filter Systems	89	✓				Moderate	Medium
AquaLogic™ Cartridge System	95	✓				Low to Moderate	High
Wet Basin	93		✓ **	✓		Large	Medium to High
Constructed Wetland	89		✓	✓		Large	Medium to High
Bioretention	89	✓				Small	Medium to High

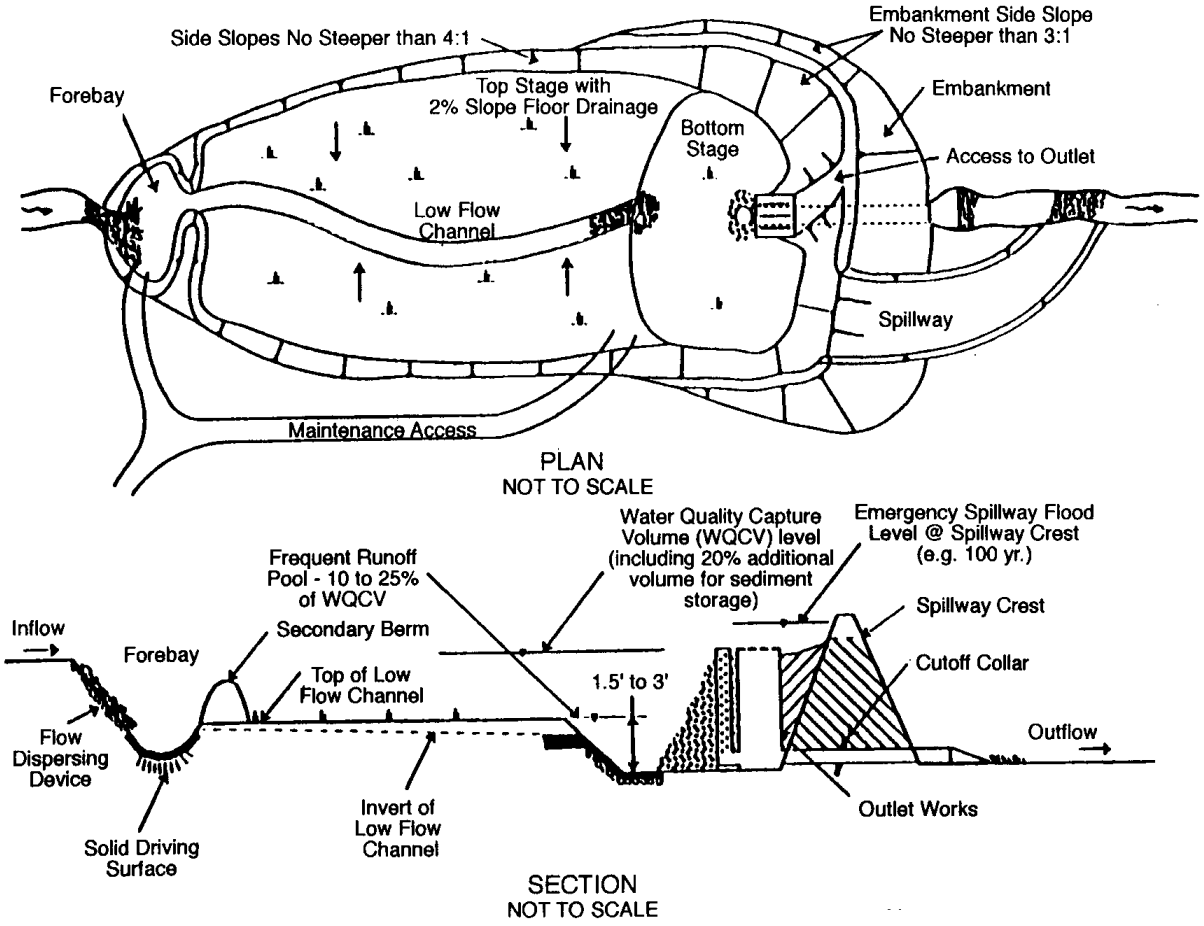
Note: * Maximum drainage for this BMP is 100 acres
** Maximum drainage area for this BMP is 1 square mile

Source: TCEQ 2005, 2009

A.4.3.1 Extended Detention Basins

Extended detention basins are primarily used as flood control devices but can be designed as a multistage facility designed to capture entire runoff volumes and allow for settling of sediments before water is discharged. They are typically used where high volumes of runoff are expected from development sites with a high degree of impervious cover. General guidelines for detention basins are presented in the COA ECM and TCEQ (2005). A schematic of a typical extended detention basin (TCEQ, 2005) is presented in **Figure A.4-9**.

Figure A.4-9: Typical Extended Detention Basin



Source: TCEQ, 2005

Numerous studies have been performed on the effectiveness of extended detention basins for improving water quality (FHWA, 2000). These studies indicate extended detention basins have removal rates between 46-98 percent for TSS, 20-94 percent for TP, 28-50 percent for TN, 24-60 percent for NO_3 and 24-89 percent for heavy metals (FHWA, 2000). Used in series with other BMPs, TSS, and other pollutant removal efficiencies could increase and removal efficiency estimates can be calculated using the TCEQ formula previously discussed.

Batch detention is a recently developed type of extended detention basin with a higher TSS removal efficiency than sand filtration. Batch Detention Basins are designed to serve as both a settling basins and a peak flow reducers. Certain designs include automated control valves. Manual override of the valves allows for the use of the basins as hazardous materials traps (TCEQ Technical Guidance Manual Addendum, July 2012).

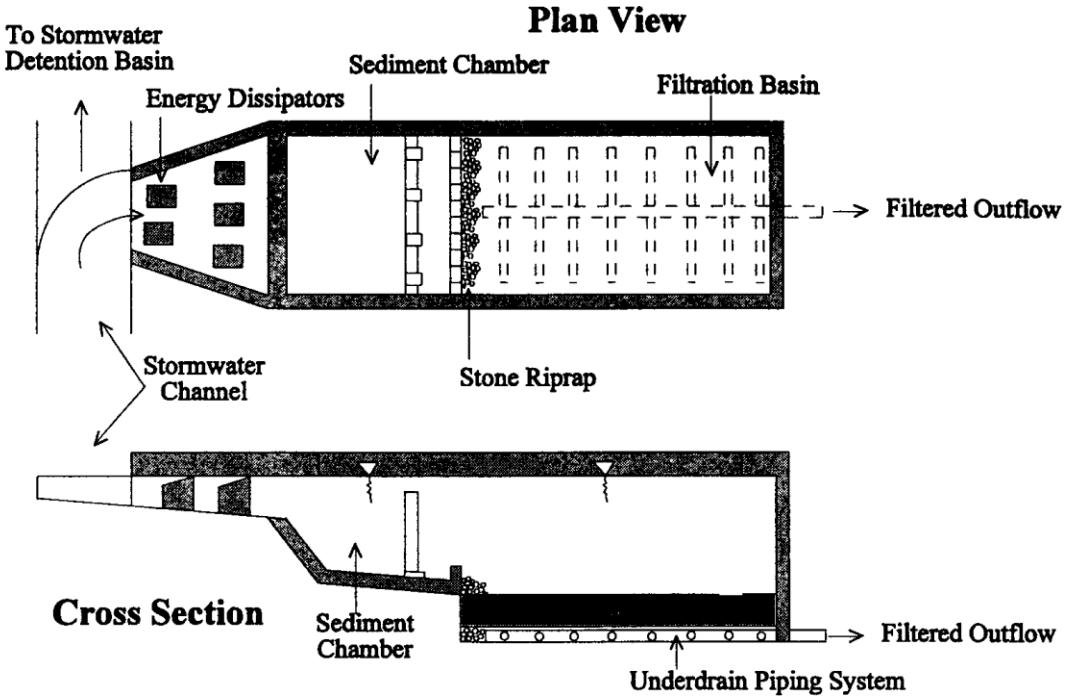
Several attributes of extended detention ponds would be carried forward for consideration for incorporation into final water quality pond designs. Key attributes include the ability to detain stormwater for slow release after peak flows have diminished, high sediment

removal potential, and the potential to integrate hazardous material detainment capabilities into the pond.

A.4.3.2 Sand Filters

Sand filters are used regularly as primary stormwater treatment systems in the Austin area (COA, 2013). These can be used as stand-alone systems and can be configured as a single basin or with separate sediment and filtration basins. Maintenance can be higher for sand filters due to potential for clogging, but these filters are very effective in areas with high impervious cover (CalTrans, 2004). A schematic plan view of a typical sand filter is shown in **Figure A.4-10**.

Figure A.4-10: Typical Sand Filter



Source: TCEQ, 2005

Sand filters have demonstrated TSS removal efficiencies of 81-90 percent, TP removal of 39-32 percent, and removal of heavy metals such as zinc 80-92 percent, copper 50-66 percent, and lead 85-87 percent (CalTrans, 2004). COA specifications for sand filtration systems assumes efficiency ratios as 87 percent for TSS, 61 percent for TP, 31 percent for TN, 67 percent for COD, 51 percent for BOD, 61 percent for TOC, and 80 percent for lead and zinc (COA, 2013). TCEQ (2009) recognizes an 89 percent TSS removal efficiency for these BMPs. Sand filters have also been effective at reducing dissolved metals and other pollutants commonly associated with highway runoff such as total petroleum hydrocarbons (TPH) like oil

and grease (CalTrans, 2004). A comparison of sand filter technology using pretreatment areas such as sediment basins, detention ponds, catch basins, wet vaults, and gravel filters found that for small development sites, sand filter systems were capable of removing 80 percent of TSS, 40 percent of TP, and 60 percent of most metals (Schueler, 2000). The study also found that they were also quite effective at removing TPH but tended to be nitrate-leakers and were generally poor at removing TOC. Sedimentation storage prior to filtration accounted for much of the removal of TSS and bioretention was recommended to boost removal (Schueler, 2000). A summary of the sand filter BMPs in series is presented below.

Table A.4-3. Summary of Potential Efficiency of Post-Construction BMPs in Series

BMP	TSS	TP	TN	N03	Cu	Pb	Zn	Oil & Grease	COD	BOD	References
Permeable Pavement with swale (F5) Year 1/Year 2	92/89	76/66	71/81	79/80	94/94	94/94	89/86				Rushton, 2002
Permeable Pavement with swale (F6) Year 1/Year 2	91/71	3/-77	42/55	66/60	81/82	85/83	75/41				Rushton, 2002
Sediment Basin with sand filter	57/89	49/59	28/17	3/(-61)	6/72	34/86	48/76		34/55	33/51	*COA, 1997
Detention Pond with peat/sand filter	88	47	51	-15			83				*LCRA, 1997
Catch basin (with floating pillows) with peat/sand filter	84	48	30	-96			89				*LCRA, 1997
Bioretention box with sand and mulch		81/65	43/49	23/16	93/97	97/<95	96/<95				* Davis et al, 1998
Hazmat Trap with sediment basin and Vertical Sand Filter	60	low		-36*	32		63	18	1	26	*Tenney et al, 1995

** after Schueler, 2000*

To evaluate the potential effectiveness of a sand filter system when used in series with VFS one can calculate the efficiency using data provided by TCEQ (2009). Combining the efficiency of VFS (85 percent) with the efficiency of a sand filter system (89 percent), the total potential effectiveness of these BMPs in a series can be calculated using the TCEQ formula:

$E_{tot} = [1 – (1-E_1)(1-0.65E_2)] \times 100$

Where $E_1 = 0.85$ and $E_2 = 0.89$

This series yields a potential TSS removal efficiency of 94 percent. Additional BMPs at sensitive features could further reduce TSS and potential water quality impacts.

Given the high TSS removal efficiencies and extensive experience with sand filter variants, aspects of this BMP type would be carried forward for consideration for use in the proposed SH 45SW.

Vertical Sand Filters are in use on the existing SH 45 facility to the north of the proposed project. Vertical Sand Filters allow for a smaller footprint than typical sand filters and, therefore, have a smaller impervious cover impact. Vertical water flow, as opposed to horizontal spreading, is the mechanism that differentiates this type of sand filter from others (Schueler, 2000).

A.4.3.3 Wet Basins and Constructed Wetlands

A wet basin (pond) is an engineered facility that removes sediment, organic nutrients and trace metals from stormwater runoff (TCEQ, 2005). Wet basins and constructed wetlands are similar to extended detention basins except that a permanent volume of water is incorporated into the design. Properly designed and operated, wetlands have demonstrated they can remove significant percentages of total phosphorous, nitrogen, TSS and other constituents from stormwater runoff (NPRPD, 2007). These percentages are similar to those from retention ponds and appear to be highly site dependent. As discussed in the innovative BMP section, constructed wetlands used for wastewater treatment in rural areas have demonstrated effectiveness at removing nitrates and other nutrients (Tillman et al, 2013). Constructed wetlands have also demonstrated better nutrient removal than other BMPs but this can contribute to algae growth and eutrophication. Wet basins are typically utilized in areas where there is a consistent water source and therefore may not be applicable in the proposed project area.

The incompatibility of constructed wetlands with local weather patterns was discussed above. Wet basins have similar requirements which make them similarly impractical. In addition, each of these BMPs is typically designed with considerable excavation, which does not align with design goals of the proposed SH 45SW related to karst impact avoidance, and therefore, neither would be carried forward for consideration.

A.4.3.4 Infiltration Basins and Trenches

Infiltration basins and infiltration trenches are not included in TCEQ (2005) because of potential to contaminate groundwater when used on the Recharge Zone because of the presence of Type “C” and “D” soils, infiltration rates of less than 0.5 inch/hour, less than four feet separation from bedrock and clay content of the soil greater than 20 percent (TCEQ, 2005). However, effectiveness for TSS capture and removal is similar to that of retention/irrigation systems (FHWA, 2000).

Infiltration measures would not be carried forward for consideration in the proposed SH 45SW because they are not considered appropriate by TCEQ in areas such as those in the proposed project.

A.4.3.5 Manufactured BMP Devices

A variety of manufactured stormwater controls (proprietary BMPs) are available from various vendors and generally consist of hydrodynamic separators (HDS) such as; Stormceptor™, Vortechs™, Downstream Defender™, and Baysaver™ and filtering structures (FS) such as StormFilter™ ,StormTrooper™, and StormTreat™ System. HDS are stormwater management devices that use cyclonic separation to control water pollution from runoff. They are designed as flow-through structures with a settling or separation unit to remove TSS and other pollutants. HDS such as oil and grease separators are effective at removal of TPH products but can cause re-suspension of sediments especially under moderate to high flow conditions (FHWA, 2013). HDS such as Stormceptor™ have been very effective at removing smaller clay sized particles and no re-suspension of sediments occurred over time (FHWA, 2013). FS primarily utilize filters in cartridge or mat form using a variety of treatment media such as carbon, zeolite, and perlite (FHWA, 2013).

The applicability of a particular manufactured control is largely site and discharge dependent and is targeted toward specific pollutants. TCEQ reviews some of these BMPs from a generic standpoint and provides guidelines for usage to achieve the necessary 80 percent decrease in incremental TSS load (TCEQ, 2005). The advantages of pre-manufactured controls is that they have a relatively small footprint compared to conventional BMPs and can be easy to install. However, maintenance can be high and HDS may have a problem achieving 80 percent TSS reduction as a standalone method when sized to manufactures specifications (Conlon and Journey, 2008). The biggest threat to filtering systems is clogging as a result of heavy sediment loads (TCEQ, 2005). Efficiency rates should be determined on a case by case basis and are largely dependent on particle size distribution. Some example efficiencies for specific systems are presented in **Table A.5-1.**

Data collected from a review of four vendor supplied structural BMPs classified as hydrodynamic separation systems in South Carolina indicated they were generally not successful at significantly reducing highway pollutants and enhancing stormwater runoff as stand-alone systems (Conlon and Journey, 2008). Manufactured systems designed to meet site specific criteria as a last BMP in a treatment train may provide removal of fine particulates or dissolved constituents not easily removed by other BMPs.

Given the potential for low treatment volumes, high costs, maintenance requirements, and the availability of other BMPs with similar TSS removal capabilities, no manufactured BMPs would be carried forward for consideration for use in the proposed SH 45SW project.

A.4.3.6 Open Bottom Culverts

Also known as Bottomless Culverts or Arch Culverts, these structures are often installed in fish-bearing streams to allow for continuity in streambeds and unencumbered fish passage (Zwirn, 2002). Over the Recharge Zone, the bottomless culverts have another particular function, they allow for continuous infiltration and possible recharge along small drainages. These structures could also be applied in instances where sensitive feature catchments are transected by the road alignment. An example of a bottomless culvert is shown in **Figure A.4-11**.

The advantages of open bottom culverts would be considered in areas where they may offer added benefit over traditional closed bottom culverts. In particular, efforts to maintain surface water flow into recharge features occurring along a drainage can be enhanced by use of these culverts. Thus, the potential for their usage to protect features crossed by the roadway such as #55 will be evaluated during the final design phase.

Figure A.4-11: Bottomless Culvert

Uninterrupted surface flow is isolated from roadway stormwater flow.

A.5 Conclusions

The high variability of specific site conditions can make BMP effectiveness data evaluation difficult. However, calculation tools as well as the availability of BMP data through the International Database can make the evaluation of BMPs in series an effective runoff management design tool. Calculations can be performed to look at various BMPs in series providing options to select those with the highest efficiencies. For example, calculations performed demonstrated that the use of PFC and VFS for highway design and construction could remove approximately 96 percent (TCEQ method) of TSS from a conceptual roadway segment. Both of these options represent innovative BMPs that are easily implemented as part of current highway construction and represent LID approach to water quality protection. The use of BMPs in series during construction and for protection of sensitive features indicated that sediment basins and high service rock berms and/or silt fence could be used to contain over 90 percent of TSS during construction in areas with PFC and grassy vegetative swales. The SH 45SW design would remove at least 90 percent of the incremental increase in post-construction TSS load generated from the proposed project over the Recharge Zone.

Due to the environmentally sensitive Edwards Aquifer and concerns over potential adverse impacts to water quality from construction of SH 45SW, use of BMPs in series would be a valuable tool in preserving and protecting groundwater quality during construction and post-construction activities.

Table A.5-1: Summary of Efficiency of Post-Construction BMPs

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Innovative																	
Retention Pond (dry)	-1-90	0-48	-19-43	-10-79		10-79		-38-76				78-97					NPRPD, 2007
Retention/Irrigation	100																TCEQ, 2005
Permeable Pavement	82-95	60-71	80-85	NA	33-99							NA	NA	NA			MWCOG (1983); Hogland et al. (1987); Young et al. (1996)
PFC	81-96	35-78	25-63	-6-69	-7.6-96							NA	NA	NA			Klenzendorf et al (2011)
PFC	91	35	2	-13		47	90	75	-86	NA	30				-3		Barrett and Shaw, 2006
PFC	89-100																TCEQ, 2005
Bioretention [1]	75	50	50	NA	75-80							NA	NA	75			Prince George's County (1993)
Bioretention	-100-98	-100-65	-2-61	0-76		9-99		31-98				NA					NPRPD ver. 3, 2007
Bioretention	89																TCEQ, 2005
Biorention/ constructed wetland	66	55	40	32		6		57				70	15				Johnson et al. 2007
Rain Garden (shallow)	-15-71	43-91		80-86		43-70	77-97	49-72									Davis et al, 2011

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Rain Garden (deep)	-167-52	54-94		78-83		1-66	79-97	7-79									
Vegetated Swales	30-90	20-85	0-50	NA	0-90							NA	75	NA			City of Austin (1995); Claytor and Schueler (1996); Kahn et al. (1992); Yousef et al. (1985); Yu & Kaighn (1995); Yu et al. (1993 & 1994)
Vegetated Swales	23-87	-21-91.5	NA	NA	17.8-87.6[3]							NA	NA	NA	29.8-59.3		Kaighn & Yu (1996)
Grassy Swales	49	-106	30 A	27		63	68	77	49	57	74	-30[4]		O-51, D-69B			CalTrans, 2004
Grassy Swales	70																TCEQ, 2005
Vegetated Filter Strips	85																TCEQ, 2005
Vegetated Filter Strips	27-70	20-40	20-40	NA	2-80							NA	NA	NA	NA		Yu and Kaighn (1992); Young et al. (1996)

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Vegetated Filter Strips	54	53	NA	74	75-83[2]							NA	NA	NA	30		Barrett (1998)
	85-87	34-44	NA	23-50	17-41[2]							NA	NA	NA	61-63		Barrett (1998b)
	77-97		NA		76-99[2]							NA	NA	NA	NA		Barrett (2004)
	54-84	-25-40	NA	-27-20	-16-55							NA	NA	NA	NA		Yu et al. 2007
	65-70				30-60[3]												Stagge and Davis (2006)
	51-75	34-45	23-41	(-26)-(-4)				66-86							25-79		Walsh et al. (1997)
Alum Treatment	>95	>90	40-70	95	50-90							>99				60	Harper and Herr, 2000
Alum Treatment	89	89	78	95													FHWA, 2013
Open Channel Practice	18-99	-100-99	8-99	-25-99		-35-94		-3-99				-100--25					NPRPD, 2007
Standard BMPs																	
Detention Basin	72	39	14 A	8		58	72	73	ND	29	16	-122B		O-18, D-32B			CalTrans, 2004
Extended Detention Basin	46-98	20-94	28-50	24-60	24-89												FHWA, 2000
Extended Detention Basin	75																TCEQ, 2005
Batch Detention																	TCEQ, 2012

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Underground Sand Filters	70-90	43-70	30-50	NA	22-91							NA	NA	NA			Bell et al. (1995); Horner & Horner(1995); Young et al. (1996)
Surface Sand Filters	75-92	27-80	27-71	0-23	33-91							NA	NA	NA			City of Austin (1990); Welborn & Veenhuis (1987)
Sand Filter Systems	89																TCEQ, 2005
Sand Filter	75-90	up to 60	35			70						37-83			45-65		Clayton and Schueler, 1996
Austin Sand Filter	90	39	32 A	-67		50	87	80	7	40	61	72[4]		O-31, D-22[4]			CalTrans, 2004
Delaware Sand Filter	81	44	9A	-142		66	85	92	40	31	94	79[4]		O-55, D-47[4]			CalTrans, 2004
Organic Media Filters	90-95	49	55	NA	48-90							90	90	90			Clayton and Schueler, 1996; Stewart (1992); Stormwater Management (1994)

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Filtering Practice	8-98	-79-88	17-71	-100-64		22-90		33 - 94				-85-83					NPRPD ver. 3, 2007
Stormwater Ponds																	
Detention Ponds	46-98	20-94	28-50	24-60	24-89							NA	NA	NA			City of Austin (1990); City of Austin (1995); Harper & Herr (1993); Gain (1996);Martin & Smoot (1986);Young et al. (1996); Yu & Benelmoufok (1988); Yu et al. (1993 & 1994)
Dry Pond	-1-90	0-48	-19-43	-10-79		10-73		-38 - 76				78-97					NPRPD ver. 3, 2007
Wet Pond	-33-99	12-91	-12-76	-85-97		1-95		13 - 96				-6-99					NPRPD ver. 3, 2007
Wetlands	65	25	20	NA	35-65							NA	NA	NA			USEPA (1993)

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Wet basin / Constructed Wetland	93																TCEQ, 2005
Infiltration Trench[1]	75-99	50-75	45-70	NA	75-99							75-98	NA	75			Young et al. (1996)
Infiltration Basin[1]	75-99	50-70	45-70	NA	50-90							75-98	NA	75			Young et al. (1996)
Manufactured Systems																	
Hydrodynamic Separators																	
Stormceptor[5]	86																http://www.stormceptor.com
Downstream Defender[5]	90																FHWA, 2013
Vortechs[5]	80																FHWA, 2013
Baysaver ™	-8	12	0.1	25		7	-10	-4							-66	-93	Hathaway and Hunt, 2007
Oil-Grit Separators	20-40	<10	<10	NA	<10							NA	50-80	NA			Young et al. (1996)
Filtering Systems (FS)																	
Storm-Filter ™	40	17	13	-7		53	52	51	18	15	18	47B		O-52, D-67[4]			CalTrans, 2004
Storm Trooper™																	
StormTreat	98	90	77				77	90				97		90	82		http://www.stormtreat.com

Table A.5-1: Summary of Efficiency of Post-Construction BMPs cont'd

BMP	TSS	TP	TN	N03	Metals	Cu	Pb	Zn	CU*	Pb*	Zn*	Bacteria/ Fecal Coliform	Grease	TPH	COD	BOD	References
Biofilters (e.g. Storm Treat System)	40	89	NA	NA	65-98							83	NA	NA			Allard et al.(1996)
Catch Basin Inserts	NA	NA	NA	NA	NA							NA	up to 90	NA			King County (1995)
Other																	
Vegetated Rock Filters	95	82	75	NA	21-80							78	NA	NA			DRMP (1995)
Infiltration Practice	0-97	0-100	0-85	-100-100		0-89		39 - 99				NA					NPRPD ver. 3, 2007

After FHWA, 2000

NA = Not Applicable or Not Available.

BMP name/description is as per document referenced. Refer to original document for specific characteristics monitored.

Removal efficiencies may be based on either mass balance or average concentration calculations. The values may originate from evaluation of multiple events or from long-term monitoring. Ranges are provided where available and negative numbers indicate a gain.

[1] Effectiveness directly related to volume of captured runoff. Not included in TCEQ (2005)because of potential adverse impact to groundwater.

[2] concentration ranges include Cu, Pb and Zn

[3] Zn only

[4] TPH and coliform collected by grab method and may not reflect adequate removal

[5] TSS removal efficiency varies with PSD and water volume. See report for design and sizing information.

* represents dissolved metals

It should be noted that some authors have suggested that reporting BMP effectiveness in terms of percent removal may not give a completely accurate picture of BMP performance in some situations (Winer, 2000). For example, if the influent concentration of a pollutant is extremely low, removal efficiencies would tend to be low due to the existence of irreducible concentration, lower than which no BMP can achieve (Schueler, 1996). For these "relatively clean storms, low removal rates may lead to the erroneous conclusion that the BMP is performing poorly, when in fact pollutant targets may be achieved. Caution should be used when interpreting BMP efficiency results that rely on a measure of percent or proportion of a pollutant removed.

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Attachment 2
Water Quality Technical Work Group Engineering Subcommittee Memo

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WATER QUALITY TECHNICAL WORKGROUP
ENGINEERING SUBCOMMITTEE

FOR SH 45SW

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December 2013

EXECUTIVE SUMMARY

On October 9th 2013, the Texas Department of Transportation (TxDOT) conducted a Technical Workgroup meeting regarding the water quality issues of proposed SH 45SW. Present were representatives from Barton Springs Edwards Aquifer Conservation District (BSEACD), Central Texas Regional Mobility Authority (CTRMA), City of Austin (COA), Hays County, Texas Parks and Wildlife (TPWD), TxDOT, Texas State, and Travis County. During the meeting a recommendation was made that a smaller technical group consisting of TxDOT, COA, CTRMA, BSEACD, Hays, and Travis County personnel be formed. The purpose of this technical group was to utilize the knowledge and abilities of each organization to develop Best Management Practices (BMPs) for the construction and operation of the proposed SH 45SW project.

This report was prepared to provide a summary of the design and construction philosophes the engineering subcommittee deem important to include in the environmental process as it advances. Those practices include phased construction, limiting the area of disturbance, installing the applicable permanent BMPs in the early stages of construction, prevention of natural drainage from outside the state-owned ROW from mixing with construction runoff prior to treatment, separating and treating construction runoff, and construction oversight by an independent, on-site environmental compliance monitor.

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3. DESIGN PHILOSOPHIES **H-130**

4. CONCLUSIONS **H-131**

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B.1 INTRODUCTION

In recognition of the environmental sensitivity of the proposed project area the Texas Department of Transportation (TxDOT) established a Technical Workgroup to focus on specific issues in the development of a state environmental impact statement. This Technical Workgroup consists of staff from Barton Springs Edwards Aquifer Conservation District (BSEACD), Central Texas Regional Mobility Authority (CTRMA), City of Austin (COA), Hays County, Texas Parks and Wildlife (TPWD), TxDOT, Texas State, and Travis County.

The first Technical Workgroup meeting was held on October 9th, 2013 (see Appendix 1). At this meeting a summary of a previous technical workgroup from 2006 was provided. This summary described the process the engineering staff went through for analyzing best management practices (BMPs) used in the previous SH 45 project. Based on this summary it was determined that the Technical Workgroup would be divided into two smaller subcommittees. One subcommittee, consisting of engineering staff, is to utilize the processes gained from the previous work to develop BMPs for the current proposed SH 45SW project. The second committee, consisting of biologist and natural resource specialists, is to focus on biological resources. This report is based on the findings from the engineering subcommittee.

There have been three engineering subcommittee meetings to date. The first meeting held on October 24, 2013, at a TxDOT construction site and consisted of TxDOT and COA staff. The purpose of this meeting was to use a TxDOT sponsored construction site as a case study on how TxDOT and COA currently approach construction phase stormwater management (see Appendix 2). The second meeting was held at the COA water treatment plant number four on November 12, 2013 and consisted of TxDOT, COA, and CTRMA staff. The purpose of this meeting was to tour the construction site and learn more about the construction phase water management practices the COA instituted for this site specifically. The third meeting was held at TxDOT on November 20, 2013, and consisted of staff from CTRMA, Hays County, Travis County, and TxDOT. The purpose of this meeting was to discuss BMPs and design philosophies to be used as the environmental process advances (see Appendix 3).

B.2 LESSONS LEARNED

There have been three engineering subcommittee meetings to date. The primary focus of all three meetings has been water quality during the construction of the proposed project. During the first meeting on October 24, 2013 the COA described three primary approaches to stormwater management. These are prevention or diversion of off-site flows, minimizing disturbed areas, and temporary stabilization. The latter two are common practices on TxDOT projects as well.

During the second meeting on November 12, 2013 there were two major principles discussed. Those principles were having the permanent BMPs placed early in construction, in this case the sedimentation filtration basins, and having an environmental compliance monitor. The environmental compliance monitor has the authority to add additional stormwater management devices and the authority to shut down the project if the devices are not maintained within the given requirements.

The third meeting of the engineering subcommittee held on November 20, 2013 had one main purpose, to present the information discussed at the previous two meetings and see what the committee as a whole deemed important to the environmental process. The next section of this report summarizes these design philosophies and the benefits of each.

B.3 DESIGN PHILOSOPHIES

The construction of permanent BMPs, such as sedimentation filtration ponds, early or very near the beginning, of construction allows the construction site runoff to be treated by these BMPs in addition to the sedimentation control devices such as silt fence. The primary benefit to this practice is a centralized location of the construction site runoff for ease of cleanup and maintenance.

There are two concepts that can be described simultaneously because they go hand in hand with each other: phased construction and limiting the area of disturbance. By limiting the amount of disturbed area to a single drainage basin at a time, the amount of construction site runoff is limited. This would allow for the construction site runoff to be directed to the permanent BMPs that were installed early in construction. The construction in the individual drainage basins would then be completed to the stage where all permanent BMPs would be in place prior to moving to the next drainage basin. The concept of limiting the disturbed area would be accomplished by phasing the construction.

The prevention or diversion of off-site flows can also be stated as prevention of natural drainage from outside the state-owned ROW from mixing with construction runoff prior to treatment. This can be accomplished by parallel drainage ditches, also known as grassy swales, or by constructing a raised earthen berm along the state-owned ROW. The water leaving the active construction site is sediment laden and requires stormwater management controls to remove this sediment prior to leaving the construction site. By separating the off-site water, which is natural runoff, from the construction site runoff the sediment control devices can be more effective in removing silt by not treating the larger combined volume of water. When left as a permanent condition, this concept also allows for smaller permanent BMPS that only need to treat the roadway runoff while the natural runoff bypasses the roadway to the natural drainage channels.

The separated construction runoff would be treated by a comprehensive, engineered set of sedimentation control devices before it would be allowed to mix with the off-site water.

The concept of having an independent, on-site, environmental compliance officer provides the most benefit to the above discussed practices. This environmental compliance monitor would be an individual that answers to the owner of the project, not the contractor, would have the autonomy and authority over the construction practices, and the ability to address any unforeseen construction issues. This individual would have the authority to shut down the project if the proper or timely maintenance of the sediment control devices or permanent BMPs is not performed.

B.4 CONCLUSIONS

The open discussion and coordination between the various agencies in the engineering subcommittee of the technical workgroup has produced a list of construction practices that should be included in the environmental process as it advances. Those practices include phased construction, limiting the area of disturbance, installing the applicable permanent BMPs in the early stages of construction, prevention of natural drainage from outside the state-owned ROW from mixing with construction runoff prior to treatment, separating and treating construction runoff, and construction oversight by an independent, on-site environmental compliance monitor.

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Attachment 3
Sensitive Feature Protective Measures and Drainage Sheets

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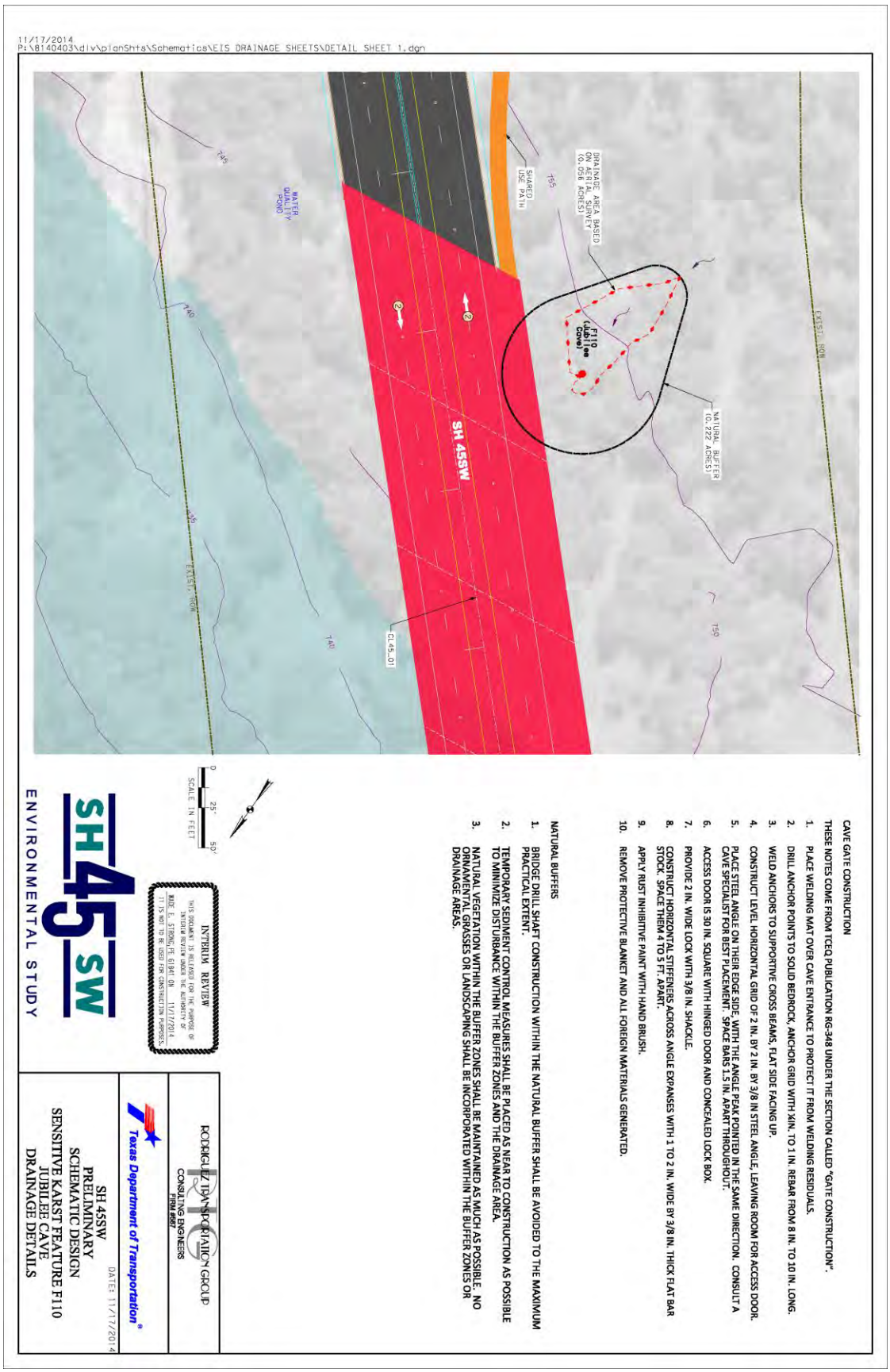

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED "GATE CONSTRUCTION".

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BRIDGE DRILL SHAFT CONSTRUCTION WITHIN THE NATURAL BUFFER SHALL BE AVOIDED TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

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11/17/2014
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CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED "GATE CONSTRUCTION".

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK. ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
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9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BRIDGE DRILL SHAFT CONSTRUCTION WITHIN THE NATURAL BUFFER SHALL BE AVOIDED TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

0 25' 50'
SCALE IN FEET

INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MARK E. STRONG, PE, 61841 ON 11/17/2014. IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #997

Texas Department of Transportation

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURES F64 & F65
DRAINAGE DETAILS

DATE: 11/17/2014

SH 45 SW
ENVIRONMENTAL STUDY

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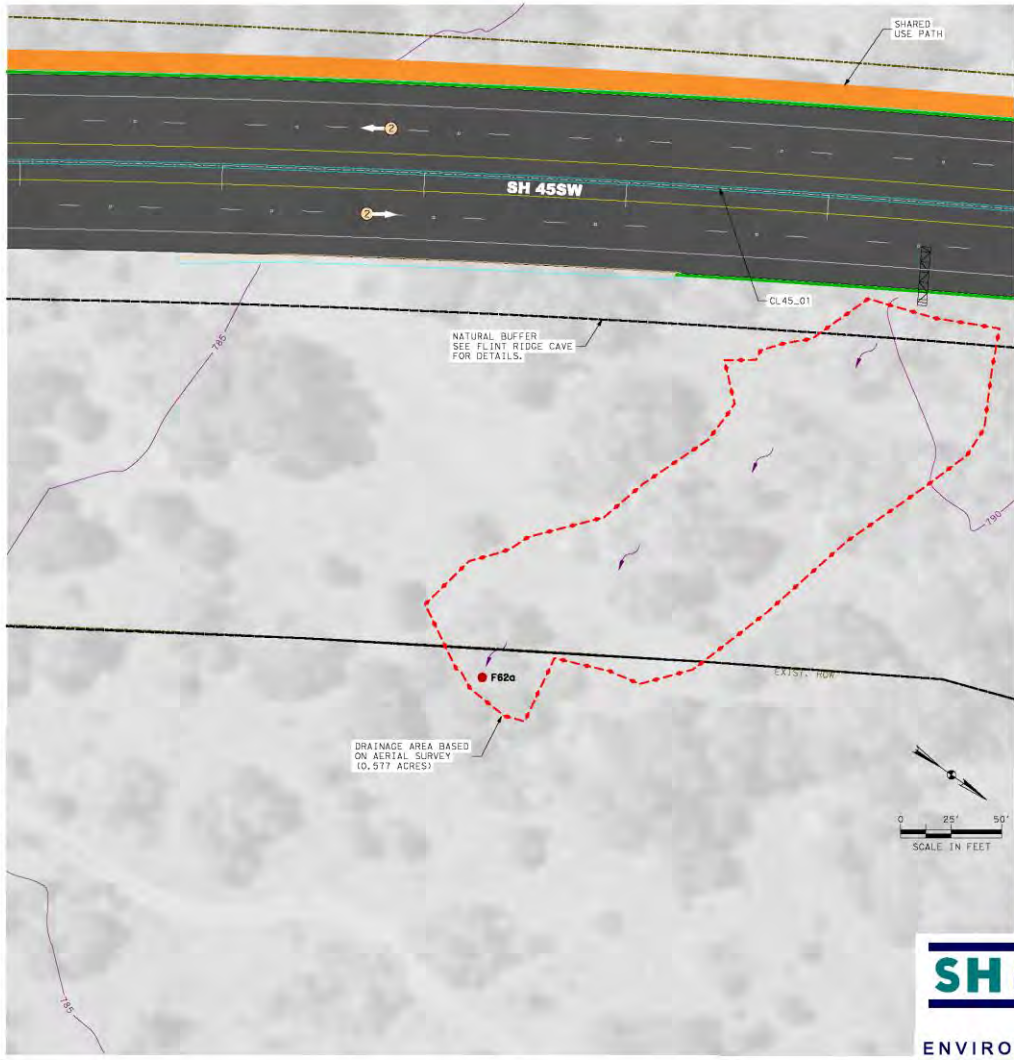

NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF WADE E. STRONG, PE 61841 ON 10/27/2014
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

SH 45 SW ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F62a
DRAINAGE DETAILS

10/27/2014
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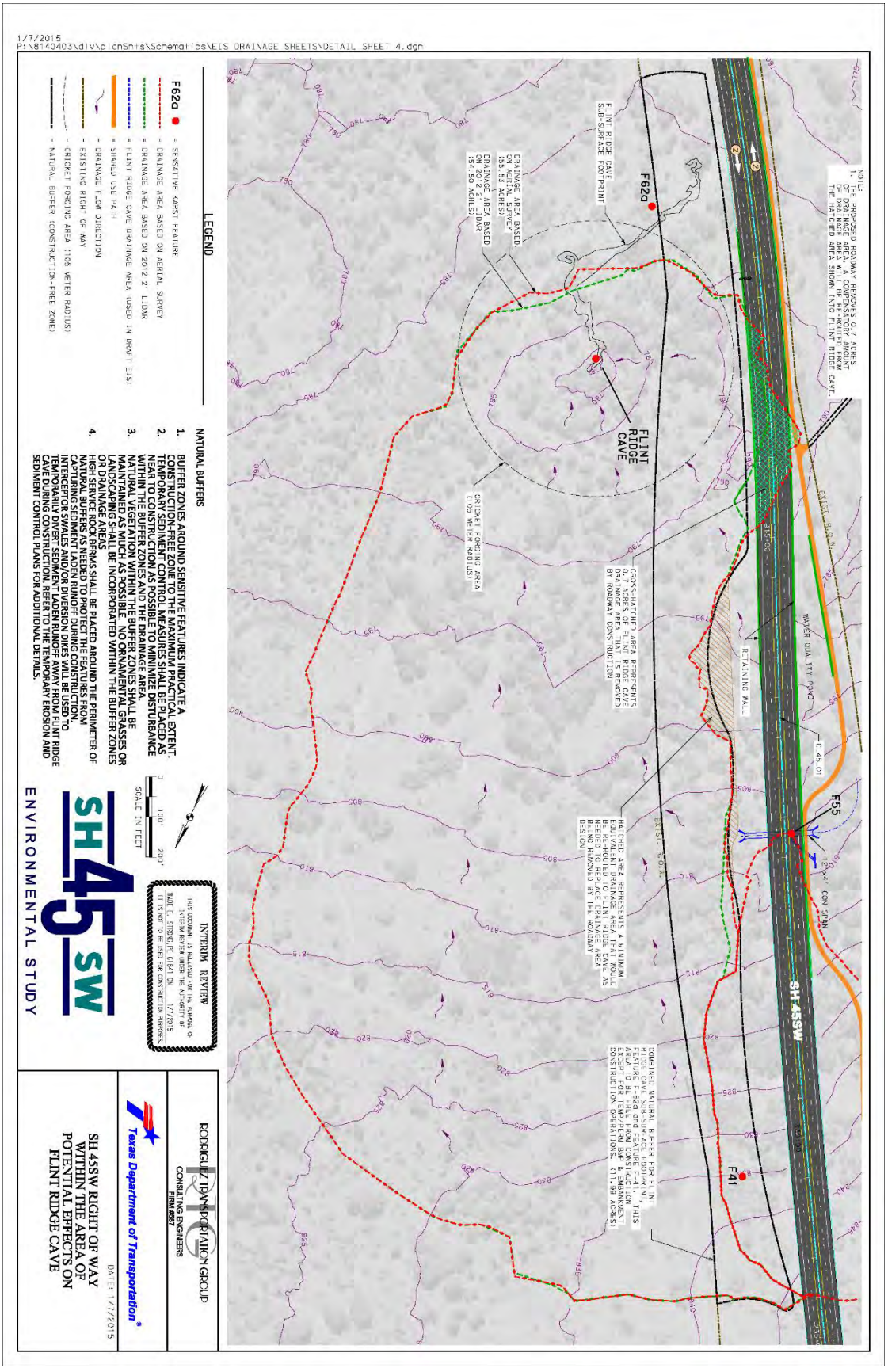
1/7/2015
P:\8140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 4.dgn
LEGEND
F62a = SENSITIVE KARST FEATURE
= DRAINAGE AREA BASED ON AERIAL SURVEY
= DRAINAGE AREA BASED ON 2012 2' LIDAR
= FLINT RIDGE CAVE DRAINAGE AREA (USED IN DRAFT EIS)
= SHARED USE PATH
= DRAINAGE FLOW DIRECTION
= EXISTING RIGHT OF WAY
= CRICKET FORGING AREA (105 METER RADIUS)
= NATURAL BUFFER (CONSTRUCTION-FREE ZONE)
NATURAL BUFFERS
1. BUFFER ZONES AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF NATURAL BUFFERS AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. INTERCEPTOR SWALES AND/OR DIVERSION DIKES WILL BE USED TO TEMPORARILY DIVERT SEDIMENT LADEN RUNOFF AWAY FROM FLINT RIDGE CAVE DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.
SCALE IN FEET
0 100' 200'
INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF WADE E. STRONG, PE 61841 ON 1/7/2015
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
SH 45 SW
ENVIRONMENTAL STUDY
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587
Texas Department of Transportation
DATE: 1/7/2015
SH 45SW RIGHT OF WAY WITHIN THE AREA OF POTENTIAL EFFECTS ON FLINT RIDGE CAVE
NOTE:
1. THE PROPOSED ROADWAY REMOVES 0.7 ACRES OF DRAINAGE AREA. A COMPENSATORY AMOUNT OF DRAINAGE AREA WILL BE RE-ROUTED FROM THE HATCHED AREA SHOWN INTO FLINT RIDGE CAVE.
FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT
DRAINAGE AREA BASED ON AERIAL SURVEY (55.53 ACRES)
DRAINAGE AREA BASED ON 2012 2' LIDAR (54.50 ACRES)
F62a
FLINT RIDGE CAVE
CRICKET FORGING AREA (105 METER RADIUS)
CROSS-HATCHED AREA REPRESENTS 0.7 ACRES OF FLINT RIDGE CAVE DRAINAGE AREA THAT IS REMOVED BY ROADWAY CONSTRUCTION
RETAINING WALL
WATER QUALITY POND
EXIST. R.O.W.
F55
12'x4' CON-SPAN
SH 45SW
F41
HATCHED AREA REPRESENTS A MINIMUM EQUIVALENT DRAINAGE AREA THAT WOULD BE RE-ROUTED TO FLINT RIDGE CAVE AS NEEDED TO REPLACE DRAINAGE AREA BEING REMOVED BY THE ROADWAY DESIGN
COMBINED NATURAL BUFFER FOR FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT, FEATURE F-62a and FEATURE F-41. THIS AREA TO BE FREE FROM CONSTRUCTION EXCEPT FOR TEMP/PERM BMP & EMBANKMENT CONSTRUCTION OPERATIONS. (11.99 ACRES)

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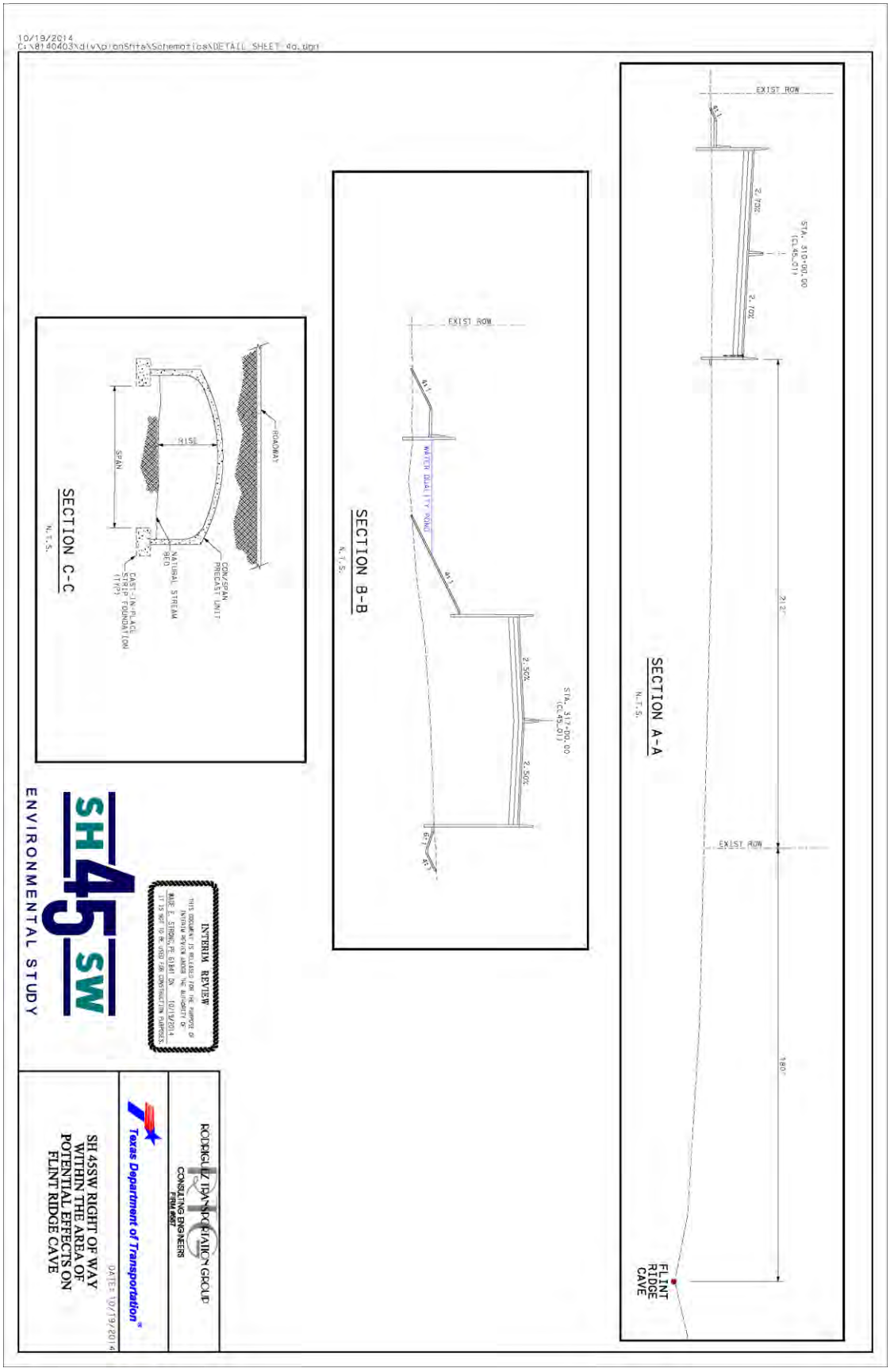
10/19/2014
C:\8140403\div\pionSnts\Schematics\DETAIL SHEET 4a.dgn
SECTION A-A
N.T.S.
EXIST ROW
STA. 310+00.00 (CL45_01)
2.70%
2.70%
212'
180'
FLINT RIDGE CAVE
SECTION B-B
N.T.S.
EXIST ROW
WATER QUALITY POND
STA. 317+00.00 (CL45_01)
2.50%
2.50%
SECTION C-C
N.T.S.
SPAN
RISE
ROADWAY
CON/SPAN PRECAST UNIT
NATURAL STREAM BED
CAST-IN-PLACE STRIP FOUNDATION (TYP)
INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MAJOR E. STRONG, PE 61841 ON 10/19/2014. IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
SH 45 SW
ENVIRONMENTAL STUDY
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #667
Texas Department of Transportation
SH 45SW RIGHT OF WAY WITHIN THE AREA OF POTENTIAL EFFECTS ON FLINT RIDGE CAVE
DATE: 10/19/2014

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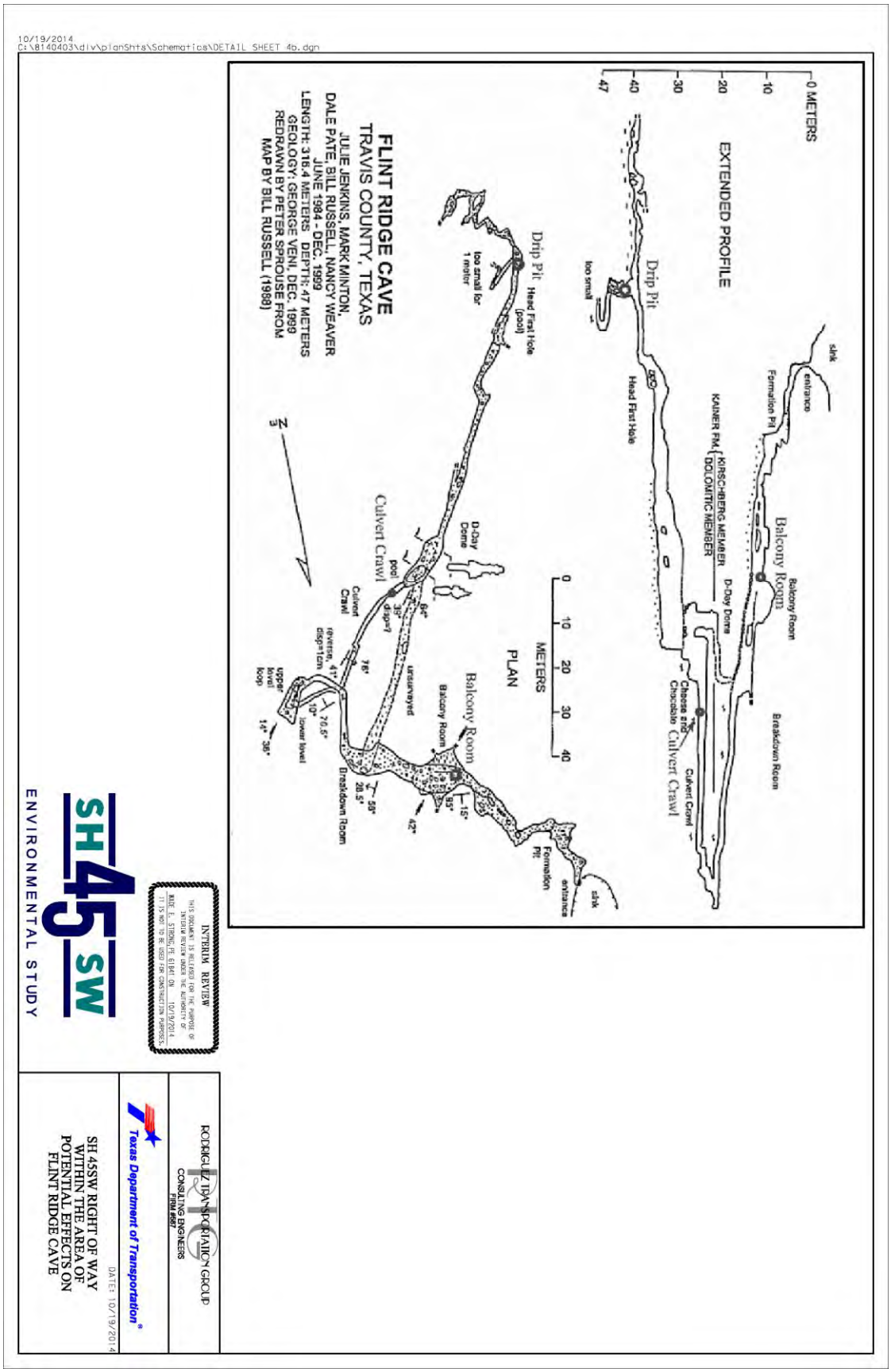
10/19/2014
C:\8140403\div\planSht's\Schematics\DETAIL SHEET 4b.dgn
FLINT RIDGE CAVE
TRAVIS COUNTY, TEXAS
JULIE JENKINS, MARK MINTON,
DALE PATE, BILL RUSSELL, NANCY WEAVER
JUNE 1984 - DEC. 1989
LENGTH: 316.4 METERS DEPTH: 47 METERS
GEOLOGY: GEORGE VENI, DEC. 1999
REDRAWN BY PETER SPROUSE FROM
MAP BY BILL RUSSELL (1988)
EXTENDED PROFILE
PLAN
METERS
Balcony Room
Breakdown Room
Culvert Crawl
Drip Pit
Head First Hole
D-Day Dome
Formation Pit
sink
entrance
KAINER FM.
KIRSCHBERG MEMBER
DOLOMITIC MEMBER
INTERIM REVIEW
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
Texas Department of Transportation
SH 45SW RIGHT OF WAY
WITHIN THE AREA OF
POTENTIAL EFFECTS ON
FLINT RIDGE CAVE
DATE: 10/19/2014
SH 45 SW
ENVIRONMENTAL STUDY

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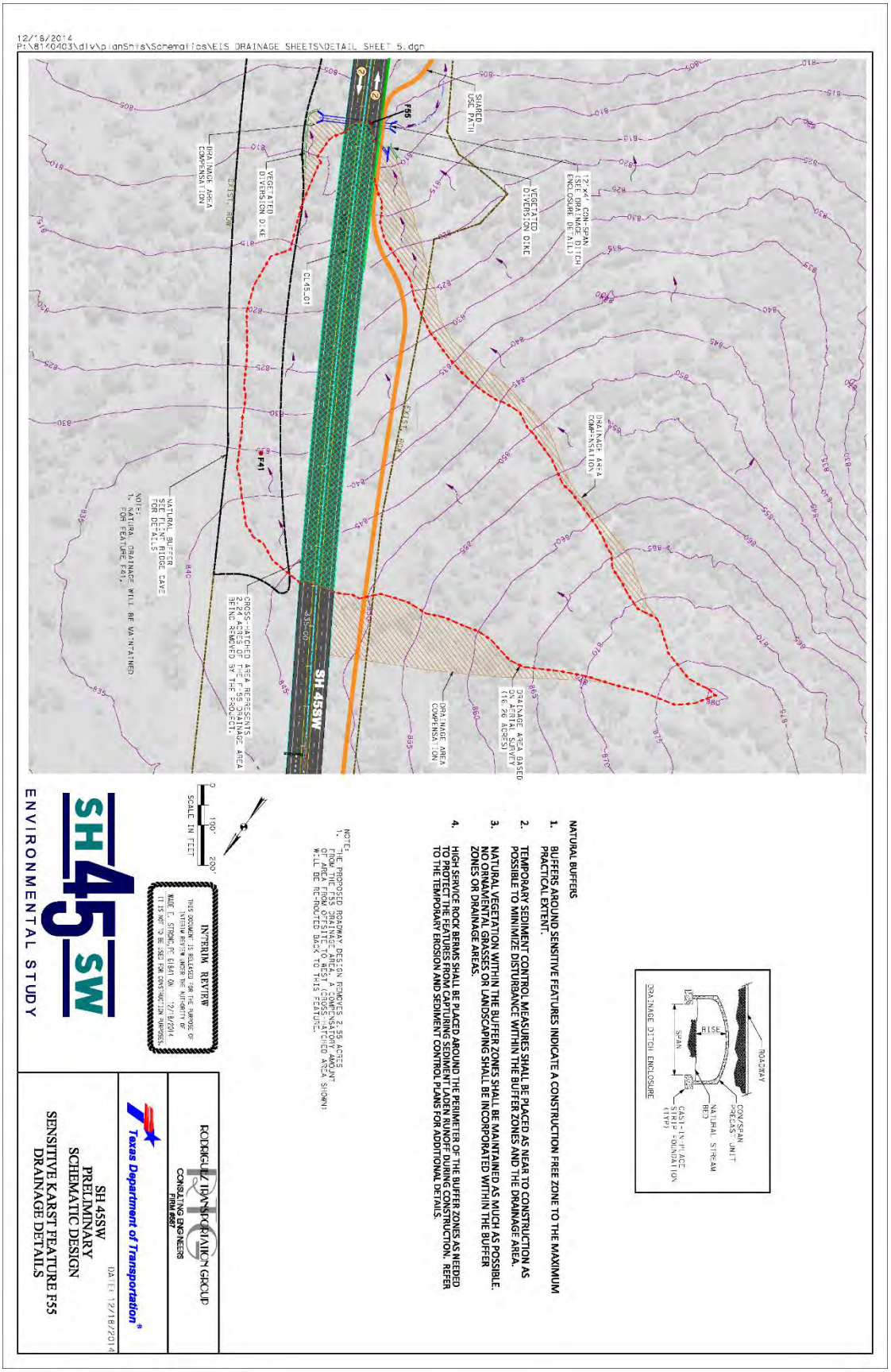
12/18/2014
P:\81140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 5.dgn
SH 45SW
SHARED USE PATH
F55
F41
VEGETATED DIVERSION DIKE
DRAINAGE AREA COMPENSATION
12'x4' CON-SPAN (SEE DRAINAGE DITCH ENCLOSURE DETAIL)
DRAINAGE AREA BASED ON AERIAL SURVEY (16.26 ACRES)
CROSS-HATCHED AREA REPRESENTS AREA REMOVED BY THE PROPOSED DRAINAGE AREA BEING ROUTED BY THE ROADWAY.
NATURAL BUFFER SEE DETAILS FOR RIDGE CAVE
NOTE: NATURAL DRAINAGE WILL BE MAINTAINED TO FEATURE F41.
CL SH 45SW
ROW
0 100' 200'
SCALE IN FEET
INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF MARK C. STRONG, PE 61841 ON 12/18/2014. IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
ENVIRONMENTAL STUDY
ROADWAY
CON-SPAN PRECAST UNIT
NATURAL STREAM BED
CAST-IN-PLACE STRIP FOUNDATION
RISE
SPAN
DRAINAGE DITCH ENCLOSURE
NATURAL BUFFERS
1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.
NOTE:
1. THE PROPOSED ROADWAY DESIGN REMOVES 2.58 ACRES FROM THE EXISTING DRAINAGE AREA. A COMPENSATION AMOUNT OF AREA FROM OFFSITE TO WEST (CROSS-HATCHED AREA SHOWN) WILL BE RE-ROUTED BACK TO THIS FEATURE.
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #987
Texas Department of Transportation
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURE F55
DRAINAGE DETAILS
DATE: 12/18/2014

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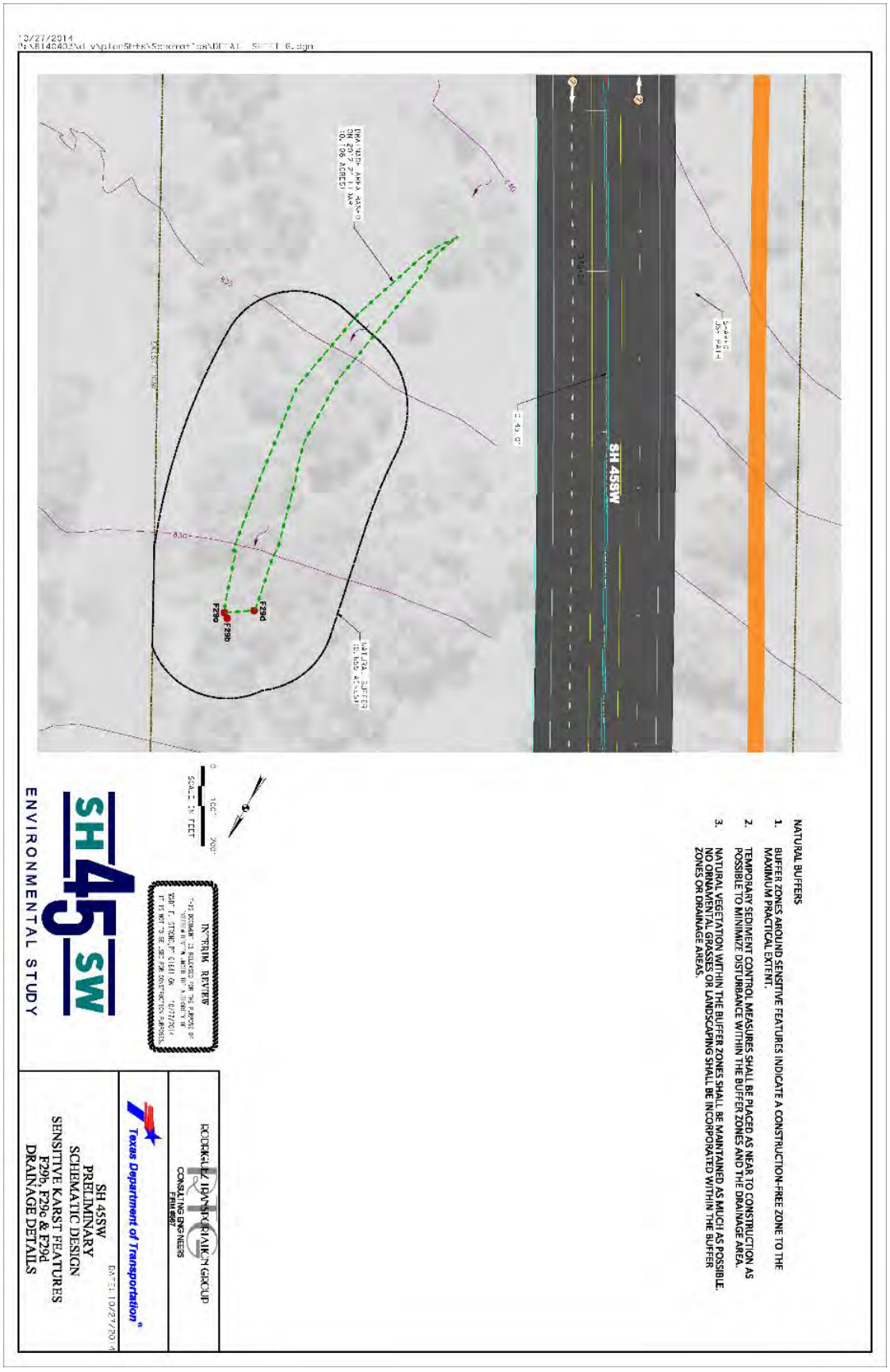
NATURAL BUFFERS
1. BUFFER ZONES AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
SH 45SW
F29a
F29b
F29c
F29d
INTERIM REVIEW
SH 45 SW
ENVIRONMENTAL STUDY
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
Texas Department of Transportation
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURES
F29b, F29c & F29d
DRAINAGE DETAILS

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SECTION C-C
RETAINING WALL
F23 (Hat Sink)
SH 45SW
DRAINAGE AREA COMPRISED OF 0.13 ACRES OF THE DRAINAGE AREA, A PORTION OF WHICH IS LOCATED TO THE SOUTH ACROSS THE EXISTING SH 45 SW ROADWAY. THE AREA SHOWN WITH HATCHING IS THE SOUTH DRAINAGE AREA.
DRAINAGE AREA BASED ON ACTUAL SURVEY (1.99 ACRES)
RETAINING WALL
F23 Sink
CAVE GATE CONSTRUCTION
THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED "GATE CONSTRUCTION".
1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK. ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.
NATURAL BUFFERS
1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.
INTERIM REVIEW
ROBERT LEE & ASSOCIATES ENGINEERING GROUP
CONSULTING ENGINEERS
FIRM #687
Texas Department of Transportation
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURE F23
HAT SINK
DRAINAGE DETAILS
DATE: 10/27/2014
SH 45 SW
ENVIRONMENTAL STUDY

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CAVE GATE CONSTRUCTION
THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED "GATE CONSTRUCTION".
1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH MIN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON TIER EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.
F18 (Cow Pattie Cave)
AUSTIN CITY LIMITS
SH 45SW
SCALE: 1" = 100'
IN-PRIM REVIEW
BOCKORLEY TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM 9667
Texas Department of Transportation
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURE F18
COW PATTIE CAVE
DRAINAGE DETAILS
DATE: 10/22/2014
SH 45 SW
ENVIRONMENTAL STUDY

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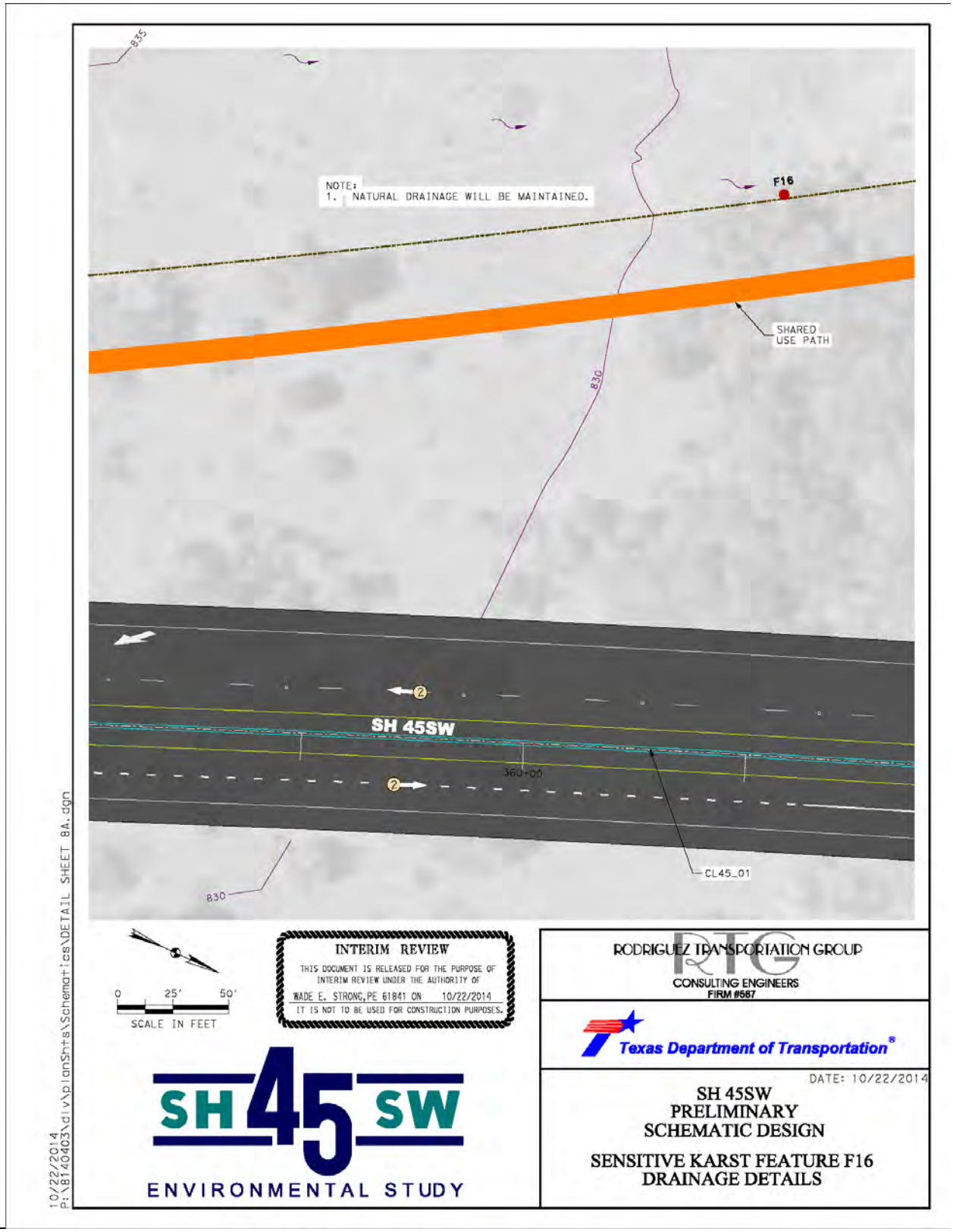
835
NOTE:
1. NATURAL DRAINAGE WILL BE MAINTAINED.
F16
SHARED USE PATH
830
SH 45SW
360+00
CL45_01
830
0 25' 50'
SCALE IN FEET
INTERIM REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF
WADE E. STRONG, PE 61841 ON 10/22/2014
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #567
Texas Department of Transportation
DATE: 10/22/2014
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURE F16
DRAINAGE DETAILS
SH 45SW
ENVIRONMENTAL STUDY
10/22/2014
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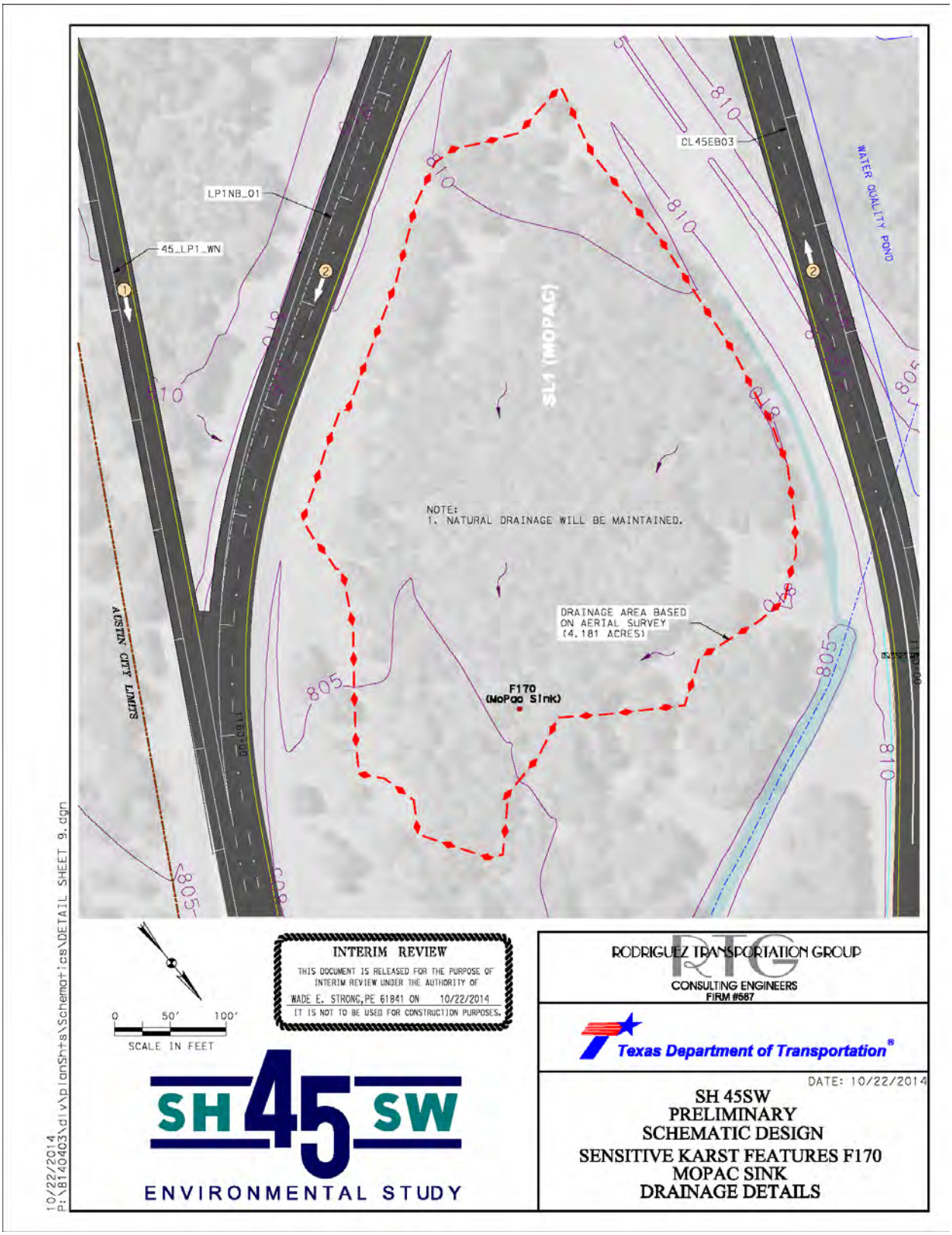
LP1NB_01
45_LP1_WN
CL45EB03
WATER QUALITY POND
SL1 (MOPAC)
NOTE:
1. NATURAL DRAINAGE WILL BE MAINTAINED.
DRAINAGE AREA BASED ON AERIAL SURVEY (4.181 ACRES)
F170 (MoPac Sink)
AUSTIN CITY LIMITS
810
805
0 50' 100'
SCALE IN FEET
INTERIM REVIEW
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WADE E. STRONG, PE 61841 ON 10/22/2014
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SH 45 SW
ENVIRONMENTAL STUDY
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587
Texas Department of Transportation
DATE: 10/22/2014
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURES F170
MOPAC SINK
DRAINAGE DETAILS
10/22/2014
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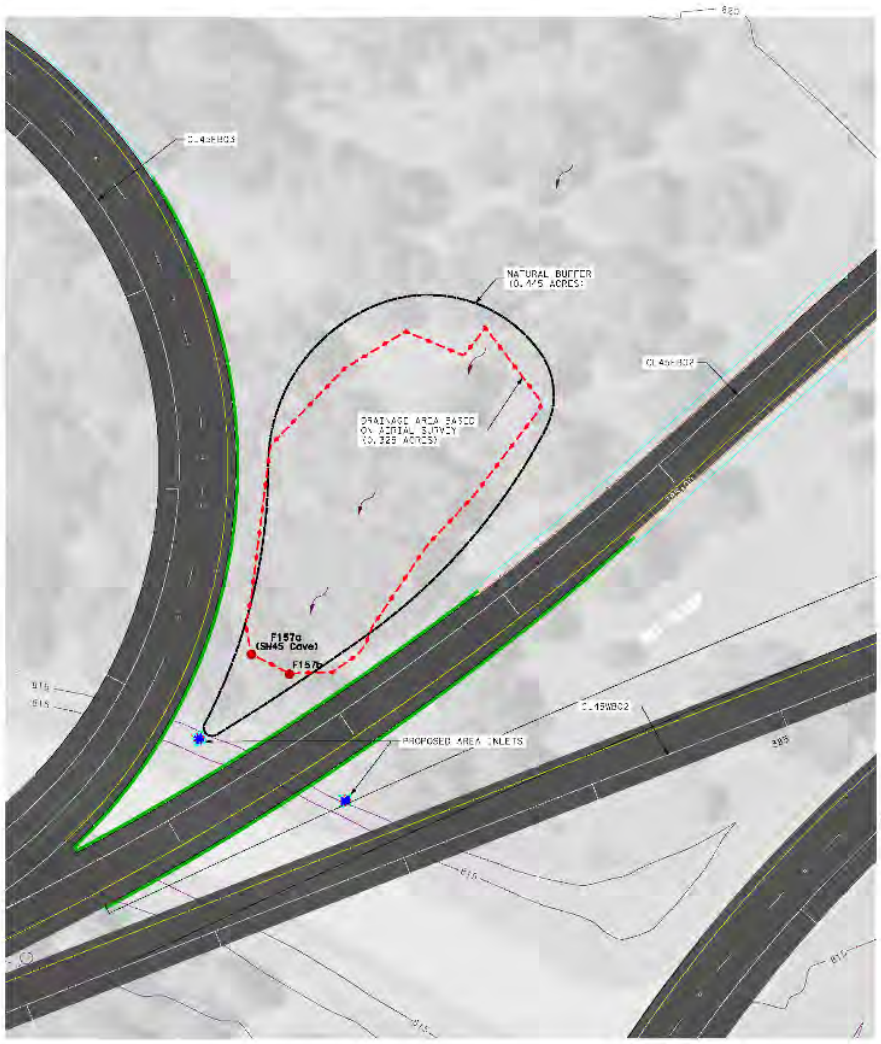

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED "GATE CONSTRUCTION".

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.2
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

INTERIM REVIEW

SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #567

Texas Department of Transportation

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES
F157a (SH45 CAVE) & F157b
DRAINAGE DETAILS

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0 25' 50'
SCALE IN FEET

INTERIM REVIEW
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WADE E. STRONG, PE 61841 ON 10/22/2014
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation

DATE: 10/22/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F161
DRAINAGE DETAILS

SH 45 SW
ENVIRONMENTAL STUDY

10/22/2014
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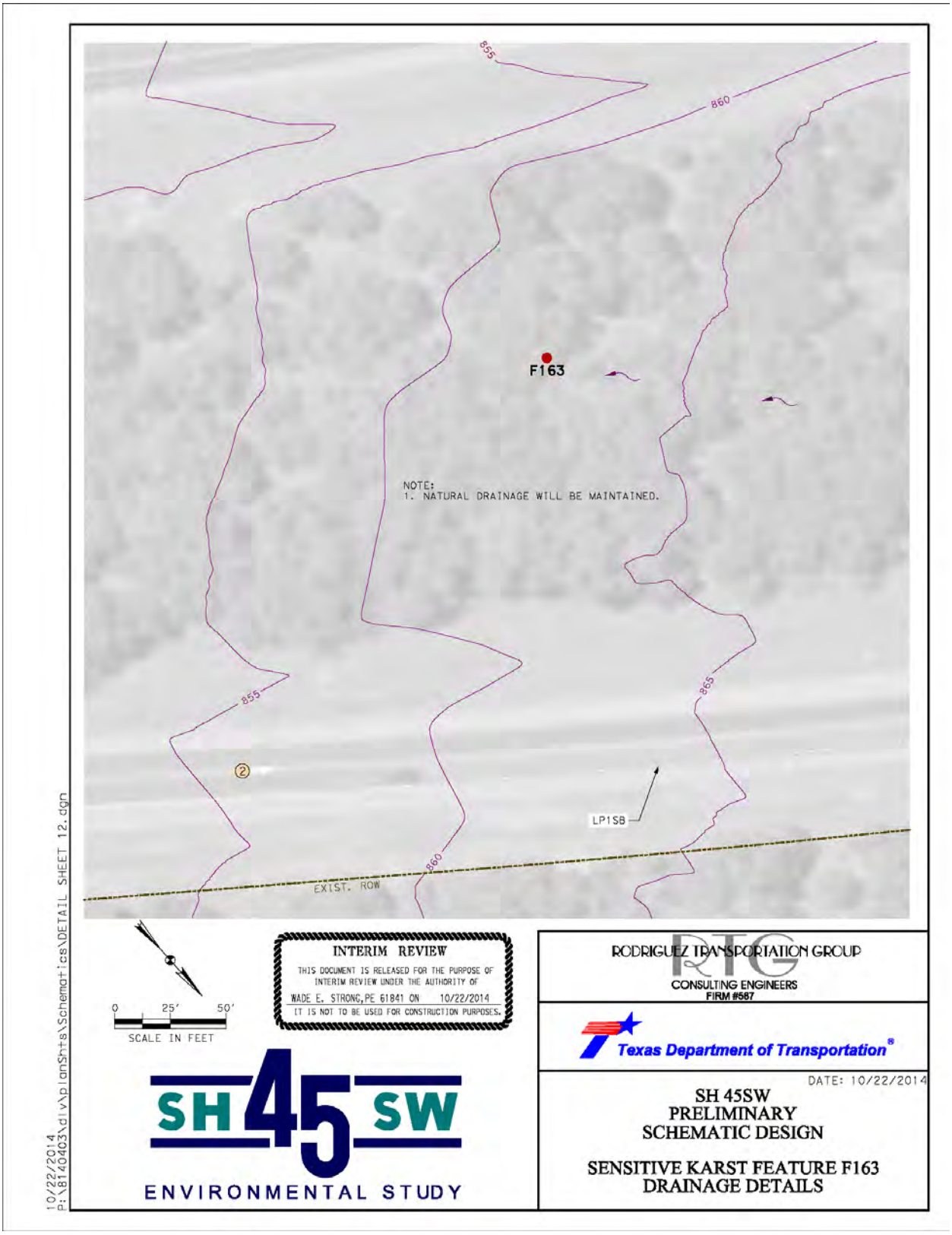
855
860
F163
NOTE:
1. NATURAL DRAINAGE WILL BE MAINTAINED.
855
865
2
LP1SB
860
EXIST. ROW
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DATE: 10/22/2014
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN
SENSITIVE KARST FEATURE F163
DRAINAGE DETAILS
SH 45 SW
ENVIRONMENTAL STUDY
10/22/2014
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APPENDIX I
CUMULATIVE IMPACTS TECHNICAL REPORT

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State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626

Travis and Hays Counties, Texas

Cumulative Impacts Technical Report

Prepared by:

Texas Department of Transportation

CSJ: 1200-06-004 & 1200-07-001

January 2015

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1.0 Introduction

This Technical Report describes the detailed analysis conducted to assess cumulative effects associated with the SH 45SW project. It summarizes guidance utilized, project scoping, resources to be analyzed, direct and indirect effects on each resource from the proposed project, other actions (past, present, and reasonably foreseeable) and their effect on resources, the overall effects of the proposed project combined with other actions, and a discussion of potential mitigation of cumulative effects.

2.0 Guidance

The SH 45SW Final Environmental Impact Statement (FEIS) describes the proposed project and its potential direct effects on the environment. The Council on Environmental Quality (CEQ) defines direct effects as those effects that are "caused by the action and occur at the same time and place" (40 CFR §1508.8). Direct effects are predictable and are a direct result of the project. The Indirect Impacts of the proposed project were assessed in the ***Indirect Impacts Technical Report***. This Technical Report builds on those two analyses.

Cumulative effects are defined as effects "on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (NEPA, 40 CFR Section 1508.7, 1978). It should be noted that guidance documents use different terms, including "cumulative impacts" (AASHTO guidance) and "cumulative effects" (TxDOT guidance). For the purposes of this analysis, both terms are used and the meaning is the same.

National Environmental Protection Act (NEPA) case law (which may be useful guidance for the EIS analysis) has emphasized the definition of a "meaningful cumulative effects analysis" rooted in the 1985 Fritiofson decision which provides:

> "the CEQ regulations [indicate] that a meaningful cumulative-effects study must identify: (1) the area in which effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions--past, proposed, and reasonably foreseeable--that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate." *Fritiofson v. Alexander, 772 F.2d 1225 (5th Cir. 1985).*

Additional guidance was published in 2011 by the American Association of State Highway and Transportation Officials (AASHTO). AASHTO *Practitioners Handbook – 12 Assessing Indirect Effects*

and Cumulative Impacts under NEPA (April 2011) emphasizes the following key tasks for cumulative impacts analysis:

1) Describe Resource Conditions and Trends
2) Summarize Effects of the Proposed Action on Key Resources
3) Describe Other Actions and Their Effects on Key Resources
4) Estimate Combined Effects on Key Resources
5) Consider Minimization and Mitigation

The following discussion follows Texas Department of Transportation's (TxDOT's) March 2014 *Cumulative Effects Analysis Guidelines*, the most recent revision of TxDOT's 2010 *Guidance on Preparing Indirect and Cumulative Impact Analyses*. According to TxDOT's 2014 Guidance, the five components of a cumulative effects analysis for a TxDOT project are:

1) Resources to be Analyzed
2) Direct and Indirect Effects on each Resource from the Proposed Project
3) Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on each Resource
4) The Overall Effects of the Proposed Project Combined with Other Actions
5) Mitigation of Cumulative Effects

These guidance documents essentially recommend the same steps for cumulative impacts analysis and those topics are covered in the technical report sections that follow. Note that according to the National Cooperative Highway Research Board (NCHRP), "if a project will not cause direct or indirect impacts on a resource, it will not contribute to a cumulative effect on that resource" (NCHRP, 2006). This analysis hinges on some core definitions. According to the Texas Department of Transportation's (TxDOT's) Guidance on Indirect and Cumulative Impacts Analysis (2010), "[t]he common definition of 'substantial' is 'of ample or considerable amount, quantity, size, etc.' Substantial impacts are those that are noteworthy." TxDOT rules define the term "significant" as it has been interpreted under NEPA and its related regulations. See 43 TAC 2.5 (26). That interpretation includes the definition used in 40 CFR 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.

3.0 Summary of Scoping Activities Completed

For the cumulative effects analysis, the scoping process is intended to "focus attention on the real issues and de-emphasize consideration of minor issues. This will appropriately narrow the scope of the environmental analysis on the issues that will have an influence on the decision or deserve attention from an environmental stewardship perspective" (TxDOT 2013). CEQ recommends focusing on key resource issues of national, regional or local significance (CEQ 1997). Public and agency scoping has been carried out by the lead agency, TxDOT, since the earliest stages of project development for SH 45SW.

Scoping for the project, including cumulative effects, was conducted via the following methods:

- Regular coordination among the study team and the project's sponsors and stakeholders,
- Public and agency involvement through public scoping and information meetings, and
- Distribution of a questionnaire to local planning entities via e-mail and phone interviews.

The public and stakeholder meetings were used to introduce the project to the general public and to solicit comments and input on the project as it progressed. Meetings with neighborhood associations, environmental groups, and other stakeholders have also been ongoing throughout the project. **Table 3-1** shows the public meetings and workshops held to date.

Table 3-1: Public Stakeholder Meetings

Meeting Type	Date
Public Scoping	10/8/2013
Environmental Listening Workshop	11/14/2013
Public Scoping	12/10/2013
Public Hearing	7/29/2014

Source: CP&Y 2014.

Technical Work Group meetings were held on a variety of topics including water quality, engineering and BMPs, and karst and biological issues. Attendees from local, state, and federal level agencies and jurisdictions were present at these meetings to provide input and voice concerns. Technical Work Group meetings will continue to be held throughout the Environmental Impact Statement (EIS) process. **Table 3-2** provides the Technical Work Group and agency meetings that have occurred.

Table 3-2: Agency Stakeholder Meetings

Meeting Type	Date
Agency Scoping	7/31/2013
Technical Work Group (Water Quality, General Environmental Issues)	10/9/2013
Engineering Work Group	10/24/2013
Engineering Work Group	11/20/2013
Technical Work Group (Water Quality, General Environmental Issues)	12/5/2013
Agency Scoping	12/10/2013
Biology and Karst Work Group	1/22/2014
Technical Work Group (Water Quality, General Environmental Issues)	5/28/2014
Technical Work Group (Water Quality, General Environmental Issues)	7/25/2014
Technical Work Group (Water Quality, General Environmental Issues)	9/25/2014

Source: CP&Y 2014.

These meetings have led to a recognition that the key resources for investigation of potential cumulative effects are associated with water quality and quantity, including surface and groundwater, karst features, and aquifer-dependent species associated with the Barton Springs portion of the Edwards Aquifer. Past studies have been consulted, and extensive data collection has taken place to ascertain connections between the proposed project and other actions in the context of the health of the particular resource. Particular attention has been paid to resources protected by legislation or resource management plans and ecologically important resources. These resources and issues are primary considerations in this Technical Report.

4.0 Resources Analyzed for Cumulative Effects

Table 4-1 includes a description of resources analyzed for potential cumulative effects. This table includes resources analyzed for substantial indirect impacts, including those that will not be studied in detail in this Technical Report. The ***Indirect Impacts Technical Report*** includes a screening tool that resulted in detailed analysis being focused on the most sensitive resources.

Land use per se is not assessed, but past, present, and reasonably foreseeable future projects are included in the analysis with reference to existing land use, transportation, and comprehensive plans that provide context for potential cumulative effects. Some other resources are dismissed from further analysis in the table that follows. Based on the analysis summarized in the table below, the following resources will be analyzed in more detail for potentially substantial cumulative effects: threatened and endangered species and water resources (Edwards Aquifer/groundwater and surface water).

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Table 4-1: Resources Analyzed for Cumulative Effects

Resource	Will the resource be directly impacted?	Will the resource be indirectly impacted?	What is the current health status of the resource? Is the resource in decline or stable?	Resource included in detailed cumulative effects analysis (if not, why not?)
Environmental Justice	No low-income or minority populations would be disproportionately impacted by the construction of the proposed project. No low-income populations (defined as over 50 percent of the population living in households with incomes at or below the 2014 DHHS poverty guideline) are found in the AOI. While concentrated minority populations do exist within the northeastern portion of the AOI, and would be included in outreach efforts, minority status alone would not result in disproportionate or adverse impacts associated with tolling.	No encroachment-alteration impacts are anticipated. The Project Level Toll and EJ analysis did not identify a disproportionate, adverse effect to low-income or minority populations. Therefore, it is not anticipated that induced growth would disproportionately impact EJ communities.	EJ groups are comprised of vulnerable populations, including minorities and low income persons. E.O. 12898 and Title VI provide protections for EJ populations. Data collected within the AOI for indirect impacts indicated no block groups below the median household income, and some blocks with greater than 50 percent minority populations.	Due to the limited size of the roadway and associated limited cost implications, although there are some minority communities in the area, there are few low-income communities and the existing roadway network would continue to be an option for those uninterested in or unable to pay the tolls. Therefore, EJ communities are not carried forward for detailed cumulative impact analysis. The CAMPO Regional Toll Analysis (2013) asserts that the implementation of the 2035 planned transportation system (including all planned toll projects) would benefit the regional EJ population. Travel times for EJ and non-EJ populations are similar in 2035; the area that showed a probable 2035 travel time disadvantage that met the disproportionate threshold does not include any tolled roadways, indicating tolling did not contribute to this disadvantage.

Table 4-1: Resources Analyzed for Cumulative Effects cont'd

Resource	Will the resource be directly impacted?	Will the resource be indirectly impacted?	What is the current health status of the resource? Is the resource in decline or stable?	Resource included in detailed cumulative effects analysis (if not, why not?)
Threatened and Endangered Species	Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, there are anticipated to be no impacts to this species from the proposed project. Two endangered salamander species, the Austin blind salamander and the Barton Springs salamander, would not be directly impacted by the proposed project. Based on best available information, no impacts to federally-listed karst invertebrates would occur as a result of the proposed project.	Potential GCWA habitat (estimated by the Texas A&M model to be ~ 4,451 acres) could be converted to developed uses in the AOI, subject to compliance with the ESA. The Austin blind salamander and the Barton Springs Salamander would not be directly impacted by the proposed project. However, they could be indirectly impacted due to possible groundwater impacts from stormwater-borne contaminants that could enter the Aquifer from induced development that could occur on approximately 13,094.5 acres of developable land in the AOI. The Build Alternative would run near Flint Ridge Cave (FRC). However, with the proposed design, no runoff from disturbed areas would enter the cave. The roadway design was revised in fall 2014 to move even farther from FRC reducing the encroachment on the FRC drainage area. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom of the rail. These inlets would be connected to an underground storm sewer system which would outfall into the water quality pond located under the Bear Creek north bridge abutment. No untreated runoff associated with the roadway would enter FRC or its surface watershed. The size of the FRC watershed would be maintained. Based on currently available information, habitat for listed karst species is not expected to occur with the state-owned ROW. The proposed project is located in an area that is unlikely to support listed karst species (SWCA and Cambrian, 2014). See also Soils and Geology discussion below.	GCWAs are an endangered migratory songbird. During their breeding and nesting season within the U.S., GCWAs are only found in Texas. Their wintering habitat is in Central America. Both the Austin blind salamander and the Barton Springs salamander are only known from the waters of Barton Springs in south Austin. Both species are neotenic, meaning that they never develop lungs and spend all their lives in water. The Austin blind salamander is primarily troglobitic and spends the majority of its life within the aquifer, whereas the Barton Springs salamander is epigean, spending most of its life at the surface of the aquifer at the interface between subterranean and freshwater spring habitat. By definition, endangered species are resources in decline; however, with regulatory protections in place, they may be considered stable.	Yes - Golden-cheeked Warbler Yes - Austin blind salamander Yes - Barton Springs salamander

Table 4-1: Resources Analyzed for Cumulative Effects cont'd

Resource	Will the resource be directly impacted?	Will the resource be indirectly impacted?	What is the current health status of the resource? Is the resource in decline or stable?	Resource included in detailed cumulative effects analysis (if not, why not?)
Soils and Geology	Soils and geologic resources may be subject to erosion and sedimentation due to the proposed project; however, these impacts would be minimized through the use of BMPs. More than 220 individual landscape features in the state-owned ROW were investigated as potential recharge features. Of these, 193 were determined to be not of karst origin. Twenty-seven features were determined to be of karst origin and can be divided into sensitive and non-sensitive categories. Ten features were categorized as non-sensitive. The seventeen sensitive features include five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge. Some features were determined to be fault-related. The proposed alignment has been adjusted to avoid the openings or surface expressions of these sensitive features. The proposed project would impact the surface drainage basins of two sensitive features in the state-owned ROW and Flint Ridge Cave; the project would include measures to divert flow from compensating areas adjacent to the natural drainage areas. In addition, a bottomless culvert is planned to span feature F-55 to allow upgradient water to infiltrate as it is conveyed beneath the roadway and provide recharge to the feature.	Recharge features allow for rapid infiltration and recharge to the underlying Edwards Aquifer. Due to the rapid rates of recharge and groundwater flow, the Edwards Aquifer, like other karst aquifers, is highly productive but also vulnerable to contamination. The species that depend on karst habitats are also sensitive due to their specific habitat needs.	Karst features, including fractures, sinkholes, and caves, contribute to the unique hydrogeology typical of karst systems and allow for recharge to the underlying Barton Springs segment of the Edwards Aquifer. Karst features can also provide habitat for karst species. Recharge features allow for rapid infiltration of water to the aquifer, particularly in the Recharge Zone. Numerous regulatory protections are in place to ensure that direct impacts to these features are minimized or eliminated. Karst geology itself is not in decline but species that are dependent on healthy karst geology for habitat are potentially in decline as discussed under Threatened/Endangered species.	No - Karst Geology as related to threatened/endangered species and groundwater is discussed in those respective sections

Table 4-1: Resources Analyzed for Cumulative Effects cont'd

Resource	Will the resource be directly impacted?	Will the resource be indirectly impacted?	What is the current health status of the resource? Is the resource in decline or stable?	Resource included in detailed cumulative effects analysis (if not, why not?)
Water Resources - Edwards Aquifer/ Groundwater	Potential consequences of the proposed project would be negligible due to the small amount of proposed impervious cover and proposed BMPs. TSS loadings after construction would be lower than native existing conditions due to proposed BMPs. Potential for pollutants in stormwater runoff from the construction site and completed roadway to enter the aquifer and potential for reductions in recharge to the aquifer resulting from increases in impervious cover would be minor. Impacts would be minimized by the use of robust BMPs during roadway construction and operation. The Build Alternative would run near Flint Ridge Cave (FRC). However, with the proposed design, no runoff from disturbed areas would enter the cave. The roadway design was revised in fall 2014 to move even farther from FRC, thus reducing the encroachment on the FRC drainage area. A retaining wall was added which also serves to capture and channelize roadway runoff into area inlets situated along the bottom of the rail. These inlets would be connected to an underground storm sewer system which would outfall into the water quality pond located under the Bear Creek north bridge abutment. No untreated runoff associated with the roadway would enter FRC or its surface watershed. The size of the FRC watershed would be maintained.	The Barton Springs segment of the Edwards Aquifer has unique hydrogeology that has produced a high-quality water source that is also vulnerable to contamination. The aquifer also provides habitat for karst and aquifer-dependent species that are sensitive due to their specific habitat needs. Groundwater quality could be impacted by stormwater-borne contaminants that could enter the Aquifer from induced development that could occur on approximately 13,095 acres of developable land in the AOI. The 5,764 acres of developable land in the AOI that are in the Edwards Aquifer Recharge Zone would have higher potential for contamination of groundwater, as well as the most strict requirements for complying with the Edwards Aquifer Rules for water quality protection.	The Barton Springs segment of the Edwards Aquifer is valuable because it supplies drinking water for approximately 60,000 people in Travis and Hays counties and provides habitat for a number of threatened or endangered aquatic species, including the Barton Springs and Austin blind salamanders. The resource is considered by some to be threatened by increased development and various levels of enforcement of regulatory protections.	Yes - Barton Springs segment of the Edwards Aquifer

Table 4-1: Resources Analyzed for Cumulative Effects cont'd

Resource	Will the resource be directly impacted?	Will the resource be indirectly impacted?	What is the current health status of the resource? Is the resource in decline or stable?	Resource included in detailed cumulative effects analysis (if not, why not?)
Water Resources – Surface Water and Wetlands	The project crosses Little Bear Creek, Bear Creek, and tributaries to Slaughter Creek, including Danz Creek. Based on preliminary design information, the creeks would be bridged. Permanent impacts to waters of the U.S. are not anticipated due to bridging and/or due to minimization of fill in W.O.T.U.S. No wetlands would be impacted. Temporary impacts to surface water quality would include potential stormwater runoff and contamination during construction. These impacts would be minimized through required utilization of robust Best Management Practices during construction as detailed in the Water Quality Technical Report. Permanent BMPs proposed include porous friction course (PFC) pavement, grassy vegetated swales, and hazmat traps.	Indirect impacts to surface waters would include stormwater runoff and contamination that could occur later in time or farther in distance from the direct impacts of the project. Due to connectivity with groundwater, surface water quality and quantity are also pertinent to threatened and endangered species issues. The ROW for the proposed project is approximately 312 acres, roughly 0.7 percent of the 41,674 acres in the AOI. Within 41,674 acres in the AOI, approximately 19 percent of the AOI consists of protected WQPLs, six percent is parks or open space, four percent is in floodplains/CWQZs. In addition, projects in the City of Austin's (COA) Water Quality Transition Zones (WQTZs) trigger compliance with COA environmental regulations and where the SOS ordinance applies, additional water quality protections would be in place. Indirect impacts to surface waters are not expected in these areas. TCEQ stormwater protection plans and Section 404 Clean Water Act compliance would be required as applicable for any proposed development projects.	According to the TCEQ 2012 Section 303(d) list, Danz Creek drains to Water Quality Segment 1427A – Slaughter Creek, just north of the study area, which is listed due to an impaired macrobenthic community (visible organisms found on/in the creek soil). Data indicate that water quality and quantity fluctuate over time but appear to be stabilizing. With various levels of regulatory protections in place, and with measures to be undertaken to virtually eliminate adverse impacts to surface waters through BMPS and design elements before, during, and after construction, this resource is considered to be stable.	Yes - Surface waters as connected to aquifer recharge features
Air Quality	Direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity and accessibility, as well as the resulting projected increases in VMT. However, EPA's new fuel and vehicle standards are projected to reduce emissions of air pollutants and MSATs are expected to offset these impacts resulting from the increases in VMT. These net emissions reductions are expected to contribute to continued maintenance and improvement of air quality and MSAT levels.	The potential indirect impacts on air quality and MSATs are primarily related to any expected development/redevelopment resulting from the project's increased accessibility or capacity to the area. However, any increased air pollutant emissions resulting from the potential development or redevelopment of the area must meet regulatory emissions limits established by the TCEQ and EPA, as well as obtain appropriate authorization from the TCEQ. Regulatory emission limits set by TCEQ and EPA are established to attain and maintain the NAAQS by assuring any emissions sources resulting from new development or redevelopment will not cause or contribute to a violation of those standards. In the Travis/Hays County area, air quality is managed regionally by the Capital Area Council of Governments in coordination with EPA and TCEQ.	The Austin-Round Rock-San Marcos MSA is currently in attainment or unclassifiable for all air pollutants under the National Ambient Air Quality Standards (NAAQS). Air quality is considered stable.	No - Air quality is considered to be stable and is managed regionally. No potentially substantial direct or indirect impacts to air quality are anticipated from this project.

Source: CP&Y, Blanton, CMEC, 2014.

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5.0 Resources to be Analyzed: Current Conditions and Trends

Cumulative effects are considered within a spatial geographic area termed the Resource Study Area (RSA). The RSA for each resource studied in the cumulative effects analysis has been delineated as appropriate to that resource. For orientation purposes, **Figure 5-1** shows jurisdictional areas that fall within the combined RSA, which was utilized as a means to obtain information from various entities about reasonably foreseeable future development projects, discussed in subsequent sections.

5.1 Threatened and Endangered Species

5.1.1 Golden-cheeked Warbler

Resource Study Area

The geographic RSA for cumulative impacts to the Golden-cheeked Warbler (*Setophaga chrysoparia*) is considered to be the same as the Area of Influence (AOI) identified in the ***Indirect Impacts Technical Report*** as this is the area most likely to be directly and indirectly impacted by the proposed SH 45SW project. The southern boundary of the RSA is RM 967 with Slaughter Lane as the northern boundary. IH 35 and RM 1826 are the eastern and western boundaries, respectively (**Figure 5-2**).

The temporal RSA for cumulative impacts to Golden-cheeked Warblers is considered to be 1982 (the year that Golden-cheeked Warblers were first recognized as a candidate species) through 2035 (the horizon year of the long range transportation plan, *CAMPO 2035 Regional Transportation Plan*).

Regulatory History

The Golden-cheeked Warbler was formally listed as an endangered species on May 4, 1990 with an emergency listing through the USFWS, giving the species 240 days of protection until a final ruling could be issued to make the listing permanent. A final rule to list the species was issued on December 27, 1990. No specific critical habitat has been defined for Golden-cheeked Warblers. They are the only species of bird whose entire breeding range occurs within the state of Texas in the mature juniper-oak woodlands of central Texas.

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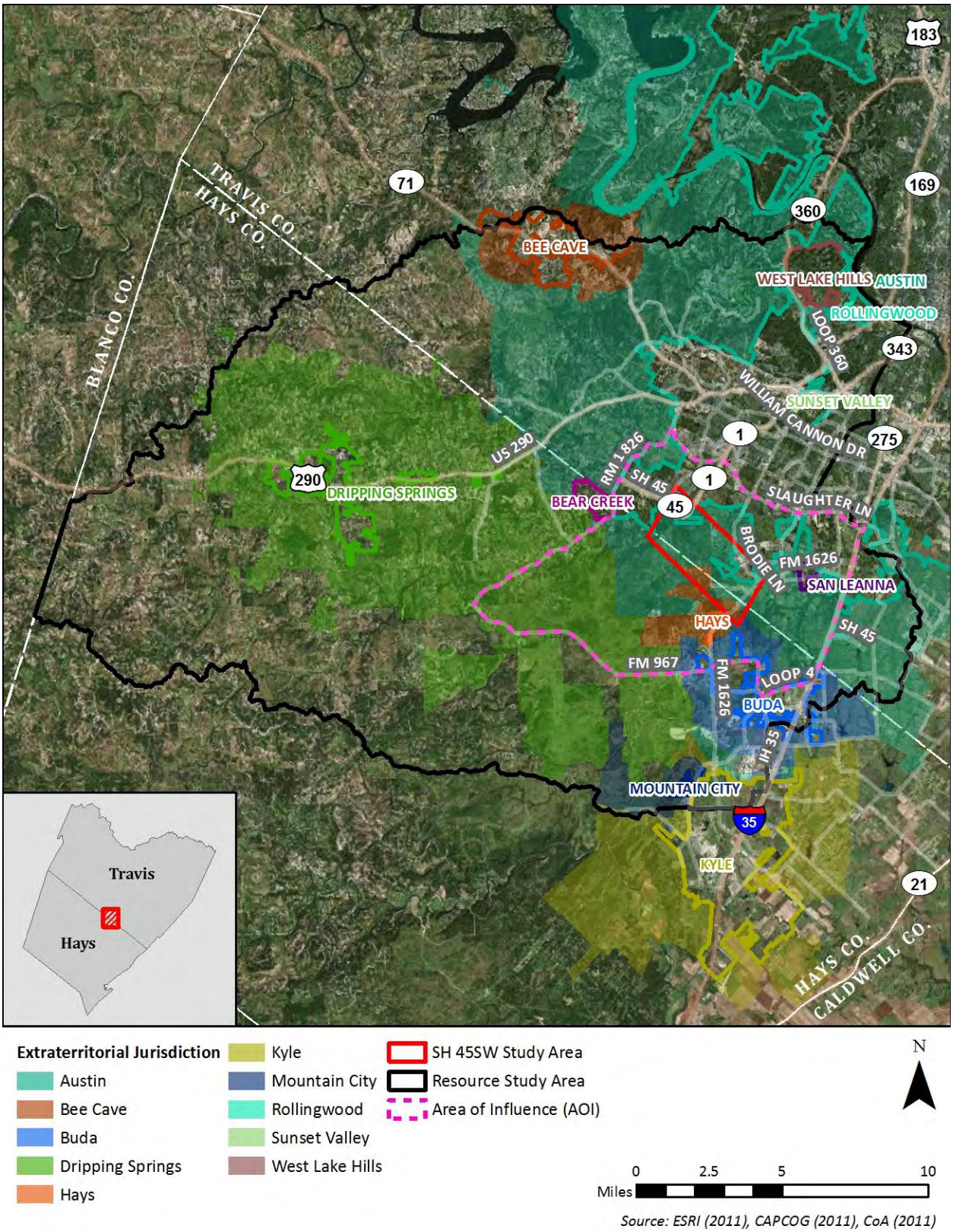
Figure 5-1: Jurisdictions in the Groundwater RSA



Source: ESRI (2011), CAPCOG (2011), CoA (2011)

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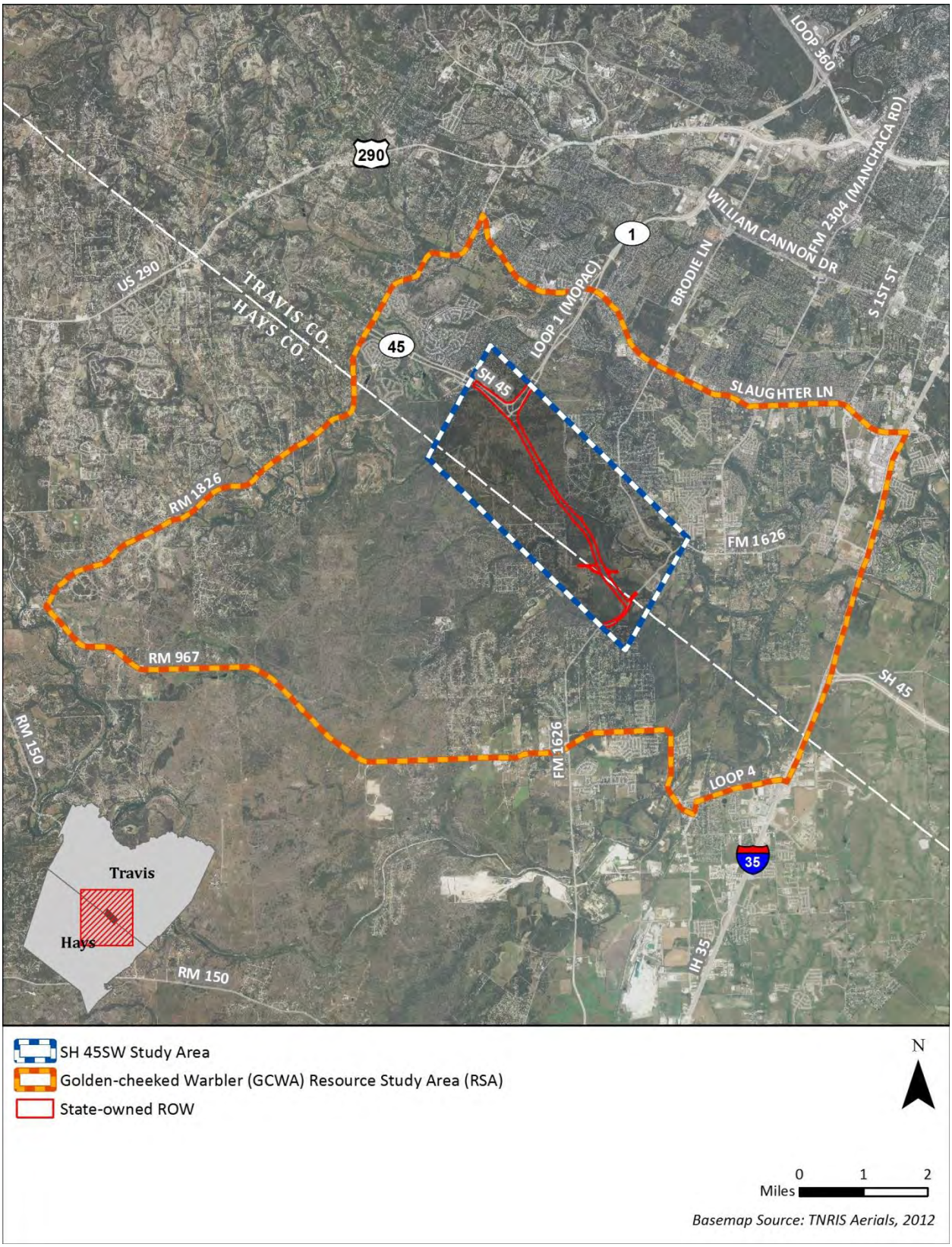
Figure 5-2: SH 45SW Golden-Cheeked Warbler Resource Study Area



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Under the Endangered Species Act (ESA), species are proposed for protection based on threats from one or more of the following factors:

A. The present or threatened destruction, modification, or curtailment of its habitat or range;
B. Overutilization for commercial, recreational, scientific, or educational purposes;
C. Disease or predation;
D. The inadequacy of existing regulatory mechanisms; or
E. Other natural or manmade factors affecting its continued existence (ESA, 1973).

Under Section 9 of the ESA, it is unlawful for any person subject to the jurisdiction of US law to import, posses, sell, deliver, carry, transport, ship, deliver, receive, carry, or take any species designated for protection under the ESA. “Take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” (ESA, 1973).

The Golden-cheeked Warbler is also considered to be a state-listed endangered species by Texas Parks and Wildlife Department (TPWD). Laws pertaining to endangered or threatened animal species in Texas are contained in TPWD Code, Chapters 67 and 68, and Section 65.171-65.176 of Title 31 of the Texas Administrative Code (TAC). These regulations prohibit the take, possession, transportation, or sale of any animal species designated as threatened or endangered under state law. However, TPWD regulations do not provide any protection for endangered species habitat.

The Migratory Bird Treaty Act (MBTA) also provides some protection to the Golden-cheeked Warbler. Under the MBTA, it is illegal to “take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations” (MBTA, 1918). However, the MBTA does not provide protection for species’ habitat.

The USFWS issued a recovery plan for the Golden-cheeked Warbler on September 30, 1992 (USFWS, 1992). The plan describes the following criteria for delisting the species:

1. sufficient breeding habitat has been protected to ensure the continued existence of at least one viable, self-sustaining population in each of eight recovery regions;
2. if no populations in a given region is viable by itself, there should be at least one population in each region that (a) is large enough to be demographically self-sustaining; (b) has the potential for gene flow to be maintained between the population and at least one other self-sustaining population so that genetic viability is provided for;

3. sufficient and sustainable non-breeding habitat exists to support the breeding populations in requirement #1 above;
4. all existing GCW populations on public land are protected and managed to ensure their continued existence, at least until the optimum and spatial arrangement of populations needed for long-term maintenance of the species (viability) is determined;
5. all of the above have been maintained for at least 10 consecutive years (USFWS, 1992).

The Golden-cheeked Warbler is one of the species addressed in the Balcones Canyonlands Conservation Plan (BCCP) (City of Austin & Travis County, 1996). The BCCP plan involves an incidental take permit for Golden-cheeked Warblers, Black-capped Vireos, and six species of federally endangered karst invertebrates under Section 10(a)(1)(B) of the ESA within Travis County. The take covered by the permit would include direct and indirect takes associated with grading, clearing, or other earth-moving activities necessary for residential, commercial, or industrial development and infrastructure projects as well as indirect impacts, such as noise, predation, and harassment from the occupancy and use of these structures. As a part of the BCCP, approximately 30,428 acres of Golden-cheeked Warbler and Black-capped Vireo habitat will be protected within a preserve system called the Balcones Canyonlands Preserve (BCP). The habitat protected by the BCP is considered to be some of the highest quality and least fragmented habitat of any county in the Golden-cheeked Warbler's range. Areas covered by the BCCP in the event of incidental take include all of Travis County with the following exceptions: the Balcones Canyonlands Preserve, portions of the Balcones Canyonlands National Wildlife Refuge (BCNWR) that fall within Travis County, and areas within city limits and planning jurisdictions of municipalities that are not participating in the BCCP. The permit will last for 30 years, and is consistent with the species' recovery plans.

On August 4, 2009, the USFWS released a Spotlight Species Action Plan for the Golden-cheeked Warbler. The target of the plan is to set a five-year goal to decrease the decline in status of the Golden-cheeked Warbler caused by rapid urbanization along the Austin-San Antonio corridor (Interstate 35) and development in areas of the Texas Hill Country that are destroying habitat, often without mitigation. The Action Plan proposes four steps to take between 2010 to 2015 to achieve this target: 1) update the recovery plan for the species to reflect the current state of knowledge and to assess whether the recovery criteria and regions are still accurate, achievable, and/or applicable; 2) complete the five-year status review of the Golden-cheeked Warblers; 3) assist with completion, implementation, and monitoring of Regional Habitat Conservation Plans; 4) work with other partners to protect habitat for the Golden-cheeked Warblers. The Action Plan states that there is the potential for more involvement from other agencies such as the Federal Highway Administration (FHWA), TxDOT,

U.S. Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), and others (USFWS, 2009).

The Golden-cheeked Warbler is also one of two bird species addressed in the Hays County Regional Habitat Conservation Plan (RHCP). The plan was written in order for Hays County to receive an incidental take permit under the ESA for the Golden-cheeked Warbler and Black-capped Vireo. The conservation program of the RHCP is based on a phased conservation banking approach that will set aside between 10,000 and 15,000 acres of preserve land over the 30-year duration of the RHCP to mitigate for habitat lost to development elsewhere in Hays County (Hays County, 2010).

Current Conditions

Golden-cheeked Warblers' breeding habitat is endemic to central Texas. It is not known to breed or nest anywhere else in the world. It is the only endemic breeding bird of Texas whose entire nesting range occurs within the state (USFWS, 1990a). It is found from Palo Pinto and Bosque counties, south through the eastern and south-central portions of the Edwards Plateau (USFWS, 1990). Golden-cheeked Warblers are present in Texas from March to approximately late July or early August, at which time they migrate to southern Mexico and Central America for the winter months (USFWS, 1992).

In 1992, the USFWS estimated the population of singing male Golden-cheeked Warblers to be approximately 13,800 individuals (USFWS, 1992). However, a recent study conducted by Morrison et al., (Texas A&M, 2010) used a combination of analysis of Landsat 5 imagery of habitat within Texas from 2007 and 2008 and field surveys conducted in 2009 to create a new estimate. Based on their data, the study estimated that there were approximately 220,615 singing male Golden-cheeked Warblers in Texas during the 2009 season. This number is almost 1,500 percent greater than the USFWS's 1992 estimate.

Golden-cheeked Warblers have been observed immediately adjacent to the state-owned ROW and in the areas surrounding the state-owned ROW as recently as the spring of 2013 (SWCA, 2013). A male was observed to have successfully mated and fledged young on the eastern boundary of the state-owned ROW, west of Bear Creek. Two other territories were observed to the west of the state-owned ROW. However, no Golden-cheeked Warblers or their habitat were found within the state-owned ROW (SWCA, 2014).

The species was determined to be imperiled primarily due to habitat loss and fragmentation due to development (USFWS, 1990).

Trends

The Golden-cheeked Warbler was first identified as a species in Guatemala by Osber Salvin in 1859. The species was formally described in 1860 by Phillip Lutley Sclater and Salvin (USFWS, 1990).

The Golden-cheeked Warbler was formally listed as an endangered species on May 4, 1990 with an emergency listing through the USFWS, giving the species 240 days of protection until a final ruling could be issued to make the listing permanent. A final rule to list the species was issued on December 27, 1990. No specific critical habitat has been defined for Golden-cheeked Warblers. They are the only species of bird whose entire breeding range occurs within the state of Texas in the mature juniper-oak woodlands of central Texas.

As discussed in the previous section, the USFWS issued a recovery plan for the Golden-cheeked Warbler on September 30, 1992 (USFWS, 1992). The plan describes the criteria for delisting the species, including the preservation of sufficient breeding habitat to maintain a self-sustaining population. The estimated date for obtaining the objectives of this plan (delisting) was 2008, which has since passed.

Most Golden-cheeked Warbler population estimates are based on the availability and size of suitable habitat patches. According the to the Natural Resource Defense Council, in 1974, the population was estimated at 15,000 to 17,000 singing males, falling to an estimated 2,200 to 4,600 birds in 1990. This decline in population is thought to be closely tied to the decline in mature juniper-oak forests and woodlands as Golden-cheeked Warbler habitat is lost to development (NRDC, 2013). In 1992, the USFWS estimated the population of singing male Golden-cheeked Warblers to be approximately 13,800 individuals (USFWS, 1992). However, a study conducted by Texas A&M University (2010) estimates the warbler population to be much higher, with singing males estimated at between 175,000 and 265,000 individual birds during the breeding season with 220,615 singing males estimated during the 2009 breeding season.

Even if the Golden-cheeked Warbler population in Texas during the breeding season is as robust as that indicated by the Texas A&M study, the species is still threatened by habitat loss as its breeding and nesting habitat is only found in central Texas. A “cedar” (including juniper) eradication program was instituted in 1948 and continued into the 1950s, eradicating approximately 50 percent of the Ashe juniper acreage in Texas. By the 1970s, areas that used to have Golden-cheeked Warbler habitat such as all of Mason County and portions of Gillespie County no longer contained suitable habitat due to range improvement programs targeting juniper. Habitat loss is an especially large threat to populations near rapidly expanding urban areas such as those found along the IH 35 corridor between Austin and San Antonio (USFWS, 1990a). It is estimated that there is approximately 4,148,138 to 4,378,400 acres of potential habitat across the breeding range of the species (SWCA, 2013). Much of this remaining habitat is fragmented, and fragmented habitat can lead to further declines in the Golden-cheeked

Warbler population due to an increase in nest predation, brood parasitism, and interspecific competition in edge habitat (USFWS, 1990a).

Warbler abundance is closely related to patch size. In the Texas A&M University study (2010), warblers were only detected in 37 percent of patches studied that were under 100 hectares (ha) (254 acres) in size. Warblers were detected in 72 percent of patches studied that were greater than 100 ha in size. Warbler abundance was also closely tied to landscape composition, with better quality habitat supporting more warblers. The USFWS has divided the breeding range of the Golden-cheeked Warbler into eight recovery regions. The proposed project and the RSA are located within Recovery Region 5. Based on the analysis of satellite imagery conducted by Texas A&M (2010), over a third of the habitat in Recovery Region 5 is under 100 hectares.

Within the geographic RSA for the Golden-cheeked Warbler, there is currently an estimated 13,275 acres of potential habitat (or 32 percent of the RSA). This estimate is based on data from the Texas A&M University (A&M, 2010) study as well as a review of recent aerial photography. Of this area, 4,427 acres of habitat are located within COA Water Quality Protection Lands (WQPLs). The Texas A&M study shows that approximately 58.22 acres, or less than one percent, of the potential habitat within the RSA falls within the state-owned ROW (**Figure 5.2**). However, the potential habitat in the state-owned ROW has been ground-truthed and found not to be used by Golden-cheeked Warblers as habitat (SWCA, 2014).

5.1.2 Barton Springs Salamander and Austin Blind Salamander

Resource Study Area

The geographic RSA for cumulative impacts to the Austin blind salamander (*Eurycea waterlooensis*) and the Barton Springs salamander (*Eurycea sosorum*) is considered to be the area of the Barton Springs segment of the Edwards Aquifer which provides the subterranean habitat and feeds the spring habitat that both species occupy. The southern boundary of the RSA represents the groundwater divide between the Barton Springs segment of the Edwards Aquifer and the San Antonio segment (**Figure 5-3**). The northern boundary of the RSA represents the northern boundary of the Barton Springs segment and the TCEQ Contributing Zone of the Edwards Aquifer. This area is located in Travis and Hays counties and includes areas of the Edwards Aquifer Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone. The SH 45SW study area is located within the eastern portion of the RSA.

The temporal RSA for cumulative impacts to these two salamander species is considered to be 1978 (the year the Barton Springs salamander, the first endangered salamander species identified in the Barton Springs segment of the Edwards Aquifer, was recognized as a distinct species from other central Texas salamander species) through 2035 (the horizon year of the current long range transportation plan).

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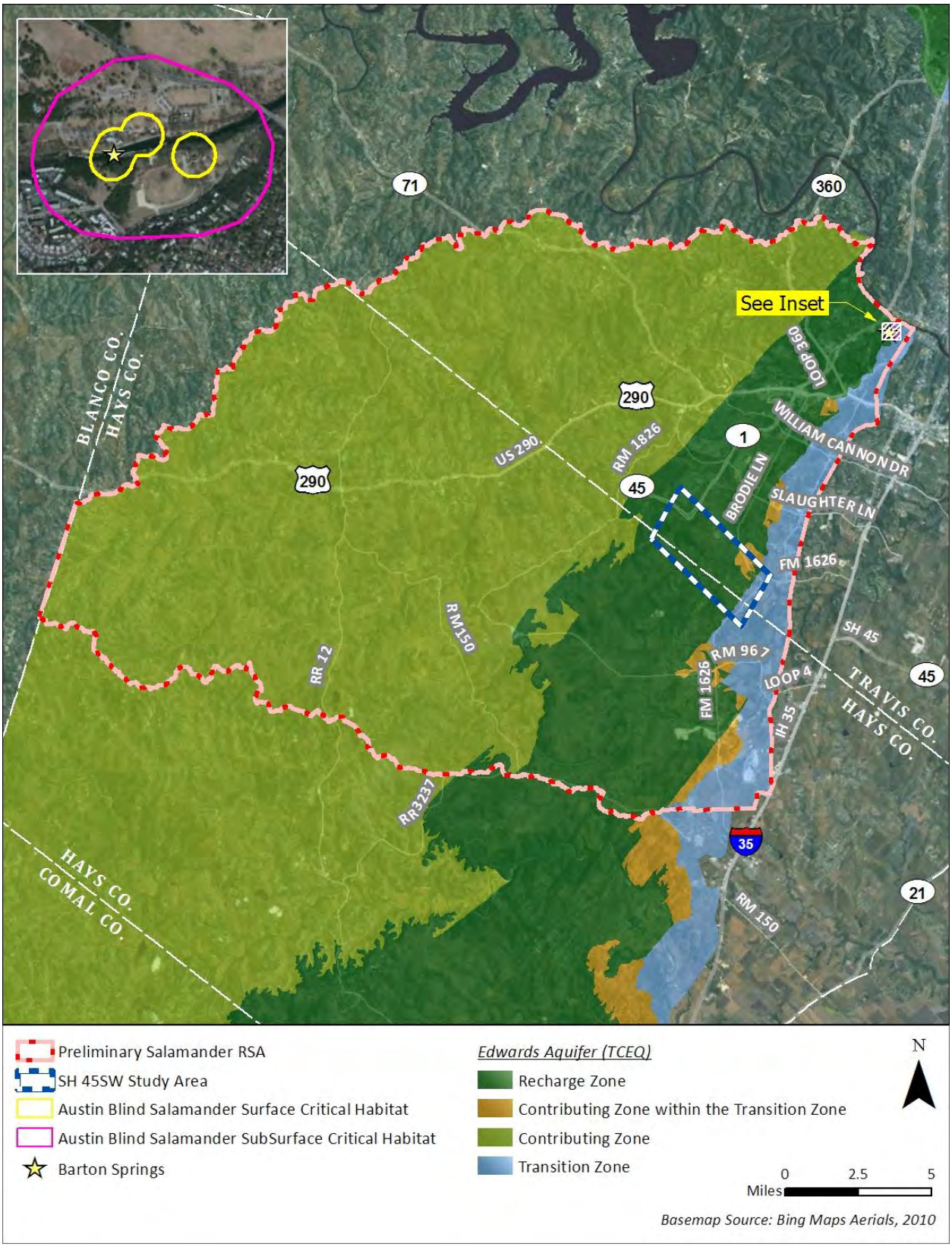
Figure 5-3: SH 45SW Barton Springs and Austin Blind Salamander Resource Study Area



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Regulatory History

The Barton Springs salamander was listed as a federally endangered species on April 30, 1997. The Austin blind salamander was listed as a federally endangered species on September 19, 2013. No specific critical habitat was defined for the Barton Springs salamander (USFWS, 1997). Approximately 120 acres of critical habitat has been designated for the Austin blind salamander (USFWS, 2013) as shown in **Figure 5-3**.

Currently, only the Barton Springs salamander is considered to be a state-listed endangered species by the Texas Parks and Wildlife Department (TPWD). The Austin blind salamander is currently listed as a Species of Greatest Conservation Need (SGCN). However, this listing will be updated to endangered as Section 68.002 of the Texas Parks and Wildlife (TPW) Code states that "species of fish or wildlife indigenous to Texas are endangered if listed on the United States List of Endangered Native Fish and Wildlife . . ." (TPW Code 68.002). Laws pertaining to endangered or threatened animal species in Texas are contained in TPWD Code, Chapters 67 and 68, and Section 65.171-65.177 of Title 31; Subchapter G of the Texas Administrative Code (TAC). These regulations prohibit the take, possession, transportation, or sale of any animal species designated as threatened or endangered under state law. However, TPWD regulations do not provide any protection for endangered species habitat. SGNCs are not currently afforded any protection under TWPD regulations (USFWS, 2013).

A recovery plan for the Barton Springs salamander was published in September 2005. The plan established recovery and delisting criteria for the species, which included: 1) protecting the Barton Springs watershed (the above and belowground limits of which are encompassed by the RSA) in order to maintain adequate water quality; 2) developing a plan to respond to spills of hazardous materials within the Barton Springs watershed; 3) implementing a management plan for the Barton Springs watershed; and 4) establishing a captive breeding program for the Barton Springs salamander (USFWS, 2005). No recovery plan has been developed for the Austin blind salamander to date. According to the USFWS, the greatest threat to the survival of the Austin blind salamander as a species is degradation of habitat through the decline of water quality and quantity in the Edwards Aquifer (USFWS, 2013).

In August of 2007, the Barton Springs/Edwards Aquifer Conservation District (BSEACD) published a Draft Habitat Conservation Plan (DHCP) and Preliminary Draft Environmental Impact Study (PDEIS) that addressed both the Barton Springs salamander and the Austin blind salamander (BSEACD, 2007). The purpose of the DHCP was to protect and conserve the two species of salamanders and their habitat associated with the Barton Springs/Edwards Aquifer system in order for the USFWS to issue a permit for incidental take of both species related to human utilization of the Barton Springs segment of the Edwards Aquifer. The purpose of the PDEIS was to evaluate three groundwater management alternatives and their impacts on the two salamander species and their habitats. The DHCP and PDEIS were submitted to USFWS in August of 2007. USFWS returned comments on the DHCP in November of 2008. Further

progress on the DHCP and the PDEIS was delayed by the severe drought that began in Texas in 2009 as well as changes in Federal and State policies that required modifications to the DHCP and PDEIS. Gary Franklin (BSEACD) was contacted for an update on the status of the DHCP and PDEIS. Mr. Franklin stated that work on the DHCP and PDEIS was still ongoing (personal communication, January 6, 2014).

An existing Habitat Conservation Plan (HCP) was recently modified by the COA for both species of salamander. COA salamander biologists revised and expanded the HCP for Barton Springs in July 2013 after a two-year process involving citizen input and extensive coordination with the USFWS. The current incidental take permit from the USFWS was issued in September 2013 and will expire in 2033 (COA, 2013b, 2013c). This permit allows for the incidental take of both species at Barton Springs in order to maintain the pools of the Barton Springs complex for ecological, conservation, and recreational purposes. Several habitat enhancement/reconstruction projects are described in the HCP to reverse anthropogenic habitat modifications within the Barton Springs complex that have resulted in loss and fragmentation of surface habitat within the springs. Under the HCP, Eliza Springs and Old Mill Springs will remain fenced off and closed to the public to protect the salamander habitat at both sites. Parthenia Springs (Barton Springs Pool) and Upper Barton Springs will both remain open to the public. Disturbance to salamanders from recreational use of Parthenia Springs and Upper Barton Springs is thought to be short term and minimal, affecting individual salamanders as opposed to the entire population (COA, 2013b).

In addition to those listed above for the salamanders, there are several federal-, state-, and municipal-level protections in place for surface and groundwater quality and quantity that may provide indirect protection to both species of salamander by protecting water quality. Examples of these measures include acquisition by the COA of approximately 27,630 acres of WQPLs, 26,516 of which fall within the RSA, and 30,444 acres of BCP properties, 8,898 acres of which fall within the RSA. Both of these measures serve to protect groundwater quality in the Edwards Aquifer and, by extension, Barton Springs.

Current Conditions

Until recently, the Austin blind salamander and the Barton Springs salamander were both believed to occur only within and in the immediate vicinity of the Barton Springs complex. The Barton Springs complex is an area of four hydrologically connected springs: Parthenia/Main Springs, Eliza Springs, Sunken Garden/Old Mill Springs, and Upper Barton Springs. However, in 2009, the Barton Springs salamander was observed at a site approximately 6.5 miles to the southwest of the Barton Springs complex (TXNDD, 2013). Since then it has been found in no other locations and very little information is available regarding this sighting beyond its location. Therefore, the discussion of the Barton Springs salamander will focus on the known populations at Barton Springs. The Austin blind salamander, thought to be a primarily subterranean species, is only known from the outlets of the Barton Springs complex (USFWS, 2013).

Bendik and Turner (2011) found that Barton Springs salamander populations seem to fluctuate around an equilibrium level in response to drought and flood periods. They detected density dependent population growth, which is a positive indicator of population viability.

A study by Gillespie (2011) states that the Barton Springs salamander "employs a 'storage effect' type life history strategy in which a few long-lived females capable of sperm storage, high fecundity, and prolonged survival in subterranean habitat during adverse surface conditions may be sufficient to sustain population sizes observed in this study. In addition, oviposition may be triggered by low flow conditions followed by bouts of high rainfall which drives water temperature down, and juveniles may use subterranean habitat as a thermal refuge for growth and development. As climate change threatens to increase climatic variability in central Texas, analysis of population trends as more data is collected will be crucial for determining how (the Barton Springs salamander) responds to such changes in the coming years."

Monthly surveys for the Barton Springs salamanders began at Barton Springs in 1993. Starting in 1998, surveys were also conducted for the Austin blind salamander. Based on the data available for both species, it appears that the two species' populations have been fluctuating around equilibrium levels (COA, 2013b).

Trends

Barton Springs Salamander

The Barton Springs salamander was first collected from Barton Springs Pool (i.e., Parthenia Spring) in 1946. However, it was not recognized as a distinct species until 1978 when Dr. Samuel Sweet published a paper differentiating the Barton Springs salamander from other central Texas salamander species based on its restricted distribution and unique morphological and skeletal characteristics. The species was formally described in 1993 with an adult male collected from Barton Springs Pool in 1992 used as the holotype (USFWS, 1997).

The Barton Springs salamander was described as occurring in the "dozens or hundreds" among sunken leaves in Eliza Pool when it was described in the 1970s (USFWS, 1997). However, formal collection of population data for this species began in 1993 when the COA began conducting salamander abundance and density surveys (COA, 2013b). Monthly surveys began in Parthenia Spring in 1993, followed by additional monthly surveys in Eliza and Old Mill Springs in 1995 and monthly surveys in Upper Barton Spring beginning in 1997. Abundance of the Barton Springs salamander has varied on a site-specific basis from zero to 1,234 salamanders with densities ranging from zero to 1.5 per square foot. The highest abundance of salamanders in the perennial spring sites occurred from April to June of 2008. Analysis of data from Parthenia and Eliza springs from 2004 to 2011 by COA does not indicate any significant increase or decrease in the population size of the Barton Springs salamander at these two sites.

This suggests that the population in each spring fluctuated slightly around average sizes during this time period. While this data is encouraging and suggests that Barton Springs salamanders have the potential to persist, the analysis is based on 61 and 71 data points from Parthenia and Eliza Springs, respectively, over a seven year period. The small amount of data over a relatively short period of time may not provide for a robust enough analysis to determine the long-term viability of this species at these two sites (COA, 2013b).

Because the species is neotenic and spends its entire life in the water, the Barton Springs salamander is highly dependent on the water quality of the Barton Springs segment of the Edwards Aquifer which feeds Barton Springs. There have been instances when water quality has negatively impacted Barton Springs salamanders in the past. Within a six month period in 2002, 17 Barton Springs salamanders were found in Upper Barton Springs and two at Sunken Garden Springs with bubbles of gas occurring throughout their bodies. Three more salamanders were found in February and March of 2003 in Upper Barton Springs with bubbles of gas in their bodies. This condition is referred to as “gas bubble trauma” and is a condition in which bubbles below the surface of the body and inside the cardiovascular system produce lesions and necrotic tissue that can lead to secondary infections. It is believed that this condition is caused by supersaturated water, or water that has dissolved atmospheric gasses in concentrations greater than 100 percent. Supersaturation is defined as when a solution, in this case water, contains more of a dissolved material than would normally be possible under normal conditions. An example of this would be carbonated water, which is a supersaturation of water with carbon dioxide gas. During the time when affected salamanders were found in the Barton Springs complex, supersaturation percentages were above 110 percent at all four of the springs. Of the 19 salamanders that were found to be afflicted by the condition in 2002, 12 died. Some evidence suggests that pollutants found in stormwater runoff entering the aquifer from urban areas could adversely affect an organism’s tolerance for supersaturated conditions, making them more susceptible to illness and death (USFWS, 2005).

The contamination of Parthenia Springs by the improper use of chlorine to clean the pool in 1992 resulted in a fish kill within the spring. Though no dead salamanders were found as a result of the chlorine contamination, only 10 to 15 salamanders were observed in a subsequent survey and only within a five-square-meter (54-square-foot) radius around the outflow of Parthenia Springs (USFWS, 1997). This was a relatively low survey result for the population of salamanders in Parthenia Springs.

Studies have shown that impervious cover within a watershed should generally not exceed 15 percent to prevent damage to the watershed and aquatic ecosystems therein (CRWR, 1995). For sensitive watersheds, there should be an impervious cover percentage of no greater than ten percent to prevent damage to sensitive stream ecosystems (USFWS, 2005). As stated in the **Edwards Aquifer/Groundwater Resources** section of this Technical Report (**Section 8.3**), approximately 85 percent of recharge to the Edwards Aquifer comes from six streams located within the Recharge Zone. Three of these streams or tributaries of these

streams occur within the study area: Bear Creek, Little Bear Creek, and Slaughter Creek. Recharge from the study area has been associated with the Manchaca flow route of groundwater through the aquifer which has been shown to supply water to Parthenia Springs, Eliza Springs, and Old Mill Springs of the Barton Springs complex. The largest and most stable populations of Barton Springs salamanders are within Parthenia Springs and Eliza Springs. As of 2002, impervious cover percentages in the watersheds of the three creeks within the study area were as follows:

- Bear Creek: five percent
- Little Bear Creek: three percent
- Slaughter Creek: seven percent (USFWS, 2005)

A review of 2012 impervious cover was completed by Blanton & Associates in 2014 based on 2012 imagery source from the USDA National Agriculture Imagery Program (NAIP). Impervious cover percentages on the watersheds of two of the three creeks within the study area were as follows:

- Bear Creek: 7.5 percent
- Slaughter Creek: 18 percent

As expected, impervious cover percentages increased over 10 years. Continued development of impervious cover within watersheds that provide recharge to the portions of the aquifer that sustain salamander habitat within the Barton Springs complex could have a negative impact on the Barton Springs salamander.

Barrett (2014) provides an analysis of water quality data collected by the City of Austin. Concentration of TSS, the constituent of concern that is regulated by the Edwards Aquifer Rules, is shown by the data to have a negative trend (decreasing concentration) over the past approximately 20 years. Over the past 14 years, the population of Austin has increased by 28.3 percent and Kyle has increased by 481 percent. Water quality is not tracking growth, in fact it is trending in an opposite manner. Zinc and copper, two constituents associated with roadway runoff, are also discussed and negative trends are shown for those as well. Phosphorus was shown to have a statistically insignificant negative trend, and nitrates were significantly increasing. However, nitrate concentrations in roadway runoff were below those typical of aquifer measurements.

The established performance standard for permanent stormwater control measures in the Edwards Aquifer Rules is adequate to protect water quality at Barton Springs based on a recent evaluation of City of Austin monitoring data (Herrington and Hiers 2010) by Dr. Michael Barrett of the University of Texas Austin Center for Research in Water Resources. Dr. Barrett concluded that stormwater controls have been effective in preventing degradation of water quality at Barton Springs from stormwater.

Austin Blind Salamander

The Austin blind salamander was not recognized as a distinct species from the Barton Springs salamander until 1998. Therefore, information regarding this species is more limited than information for the Barton Springs salamander (COA, 2013b). It was officially described in 2001 (USFWS, 2013).

In May 2004, the USFWS received a petition to list the Austin blind salamander (along with 224 other species) under the ESA. In August 2012, the USFWS published a proposed rule to list the Austin blind salamander as endangered. The Austin blind salamander was listed as endangered in September of 2013 (USFWS, 2013).

Population trends for Austin blind salamanders are difficult to track as the species is believed to primarily reside in subterranean habitat within the aquifer. Furthermore, as this is a relatively young species in terms of identification, there are few studies focusing on this species. However, the COA has included the species in its monthly abundance and density surveys of salamanders at the Barton Springs complex since 1998. Since 1998, the Austin blind salamander has been found in three of the four springs in the Barton Springs complex; however, it has never been observed from Upper Barton Springs. Anywhere from six to 12 Austin blind salamanders are observed per site, per year for a total of 530 different observations for all sites between 1998 and 2010 (COA, 2013b). Further analysis of the data is difficult as it occurs over a limited period of time with a relatively small number of observations. It is unclear at this time whether there are any significant population trends for this species. However, according to one study, the Barton Springs salamander may have a “storage effect” type life history strategy in which in which a few long-lived females capable of sperm storage, high fecundity and prolonged survival in subterranean habitat during adverse surface conditions may be sufficient to sustain viable population sizes (Gillespie, 2011). Therefore, it may be possible that the Barton Springs salamander has a cyclical population size that can decrease dramatically but then rebound from the few remaining individuals.

As with the Barton Springs salamander, the Austin blind salamander is neotenic and spends the entirety of its life within the water of Barton Springs or the Edwards Aquifer. It is therefore highly dependent on the water quality of the aquifer. However, unlike the Barton Springs salamander, the Austin blind salamander has never been observed to be affected by gas bubble trauma (USFWS, 2005). The species had not yet been identified in 1992 when an accidental chlorine contamination of Parthenia Springs led to an apparent decline in the number of Barton Springs salamanders observed immediately following the incident (USFWS, 1997), therefore it is unknown if this species was similarly affected.

The Austin blind salamander is only known to occur in Barton Springs. As discussed in the Barton Springs salamander trends section above, groundwater recharge from the study area flows through the Manchaca groundwater flow route to Barton Springs, primarily flowing into Parthenia, Eliza, and Old Mill Springs. These are the only three springs from which the Austin

blind salamander is known. It is therefore likely that impacts to groundwater quality in the study area could have the same potential to impact the Austin blind salamander as they would the Barton Springs salamander (COA, 2013b; USFWS, 2005).

5.2 Edwards Aquifer/Groundwater Resources

The geographic RSA for cumulative impacts to groundwater associated with the proposed project is considered to be the area of the Barton Springs segment of the Edwards Aquifer that is regulated by the TCEQ or the Barton Springs/Edwards Aquifer Conservation District (BSEACD) (**Figure 5-4**). The southern boundary of the RSA represents the approximate groundwater divide between the Barton Springs segment of the Edwards Aquifer and the San Antonio segment, as determined by dye tracing studies (BSEACD, 2003; Hunt et al., 2006). The northern and western boundaries of the RSA represent the extent of the TCEQ-regulated Contributing Zone. The eastern boundary of the RSA represents the boundary between the Transition Zone and the Saline Zone of the Edwards Aquifer, and is the eastern limit of TCEQ jurisdiction under the Edwards Aquifer Rules. The RSA is located in Travis and Hays counties and includes the Edwards Aquifer Contributing Zone, Recharge Zone, and Transition Zone, and Contributing Zone within the Transition Zone of the Barton Springs segment of the Edwards Aquifer.

The temporal RSA for groundwater begins with 1970, which is the year that Edwards Aquifer water quality regulations took effect. Prior to 1970, there was a general trend of increasing awareness and understanding of groundwater resources and concern over groundwater conservation, partially due to the record drought of the 1950s (Brown, 2006). The temporal RSA for groundwater extends through 2035 (the horizon year of the long range transportation plan, *CAMPO 2035 Long Range Transportation Plan*).

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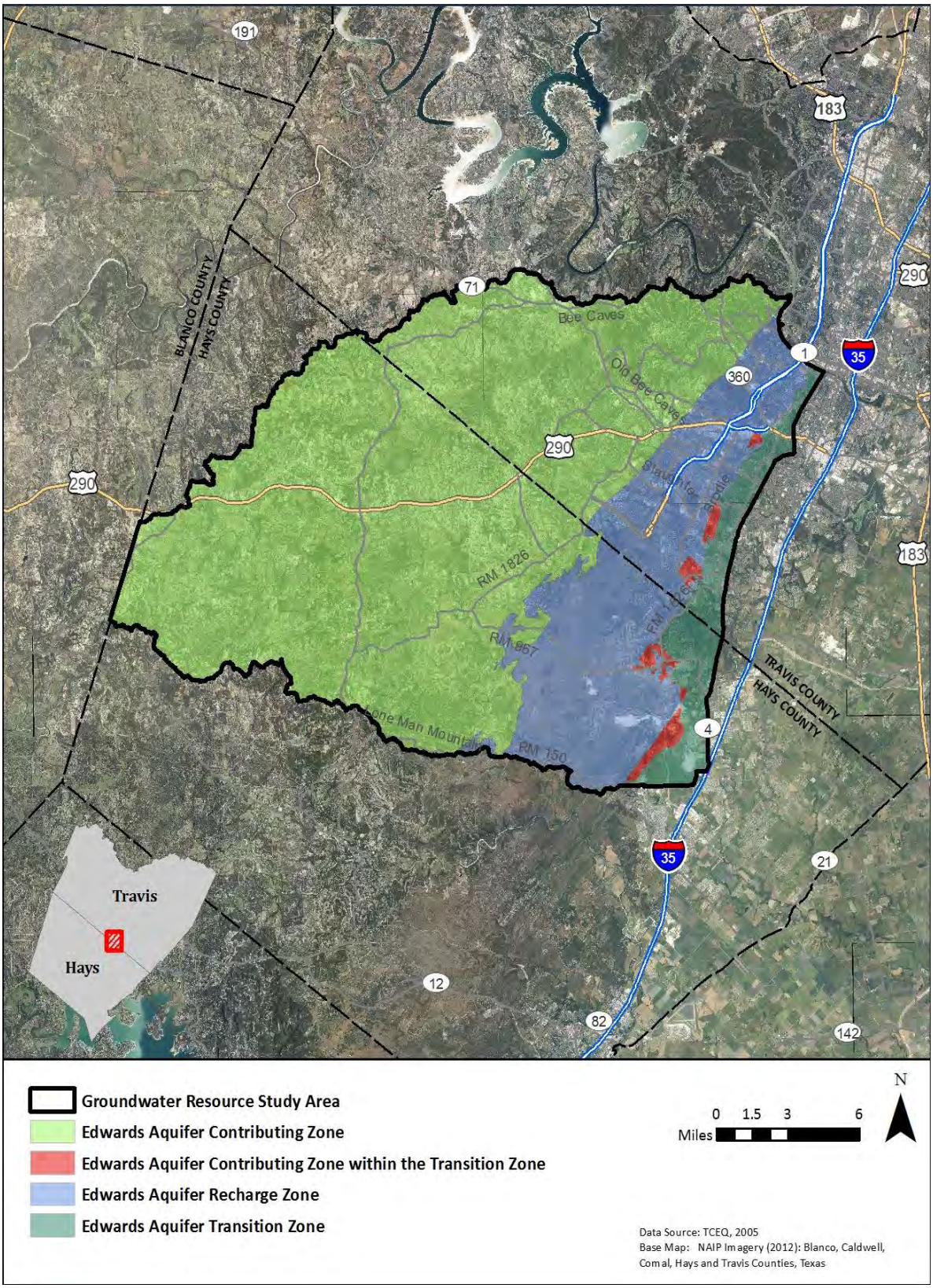
Figure 5-4: SH 45SW Groundwater Resource Study Area



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Regulatory History

Due to the importance of the Edwards Aquifer as a water source for a growing population, various regulations have been established to conserve water supply and protect water quality within this resource. Historically, the framework for groundwater rights in Texas has been the common law "Rule of Capture." Groundwater was not legislated in Texas until the passage of the Texas Underground Water Conservation Act in 1949, which allowed for the establishment of groundwater conservation districts (Brown, 2006; TCEQ, 2013).

In 1959, the Edwards Underground Water District was formed to supply maps and to assist licensing authorities. The first regulations for protecting the quality of water in the Edwards Aquifer were not issued until 1970 (TCEQ, 2013). These rules regulated development, including underground storage tanks, aboveground storage tanks, and sewer lines, over portions of the aquifer in Kinney, Uvalde, Medina, Bexar, Comal, and Hays counties (TCEQ, 2013; EPA 2012). Throughout the 1970s and 1980s, additional water quality regulations were established, including requirements for water quality protection measures (31 TAC Chapter 313) which would lead to the establishment of, and requirements for water-pollution abatement plans (WPAPs) and geologic assessments, and the introduction of fees for reviews and inspections (TCEQ, 2013). Construction activities in portions of Williamson County were first regulated in 1986; construction in portions of Travis County became regulated in 1990 (TCEQ, 2013).

Groundwater water quality protections were codified in 1996 in Title 30 of the Texas Administrative Code (TAC) §213 and are known as the "Edwards Aquifer Rules" (TCEQ, 2008). These regulations provided protection from development activities that could harm the aquifer, including residential, commercial, and industrial construction activities that are located on the Recharge and Transition Zones. Requirements included the submittal of a WPAP and a geologic assessment, and focused on regulating new construction activities that have the potential to pollute the Edwards Aquifer and hydrologically connected surface streams (TCEQ, 2011). Significant rule changes in 1999 brought the Contributing Zone into regulation under the Edwards Rules, and added a design performance standard for permanent best management practices (BMPs) (TCEQ, 2013). Currently, the Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone of the Barton Springs segment of the Edwards Aquifer are regulated by TCEQ rules in Travis and Hays counties. Rules relevant to both the Transition Zone and the Contributing Zone apply in areas designated Contributing Zone within the Transition Zone (TCEQ, 2011). The TCEQ has also issued guidance regarding optional enhanced water quality measures and BMPs designed to protect aquatic and karst threatened and endangered species.

The Safe Drinking Water Act of 1974 allowed the EPA to issue drinking water regulations that apply to all public water systems. These regulations set standards for maximum concentrations of constituents and provided rules for sampling of public water systems. The

1996 amendments to the Act provided new and stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection.

The COA has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. These ordinances include requirements for setbacks, impervious cover limits, and various other water quality protection measures; additional information is provided in **Section 8.3**.

In 1987, the BSEACD was established as a groundwater conservation district for the Barton Springs segment of the Edwards Aquifer (BSEACD, 2010). The BSEACD was created with the directive to conserve, protect, and enhance the groundwater resources in its jurisdictional area. The jurisdictional area of the BSEACD includes the Recharge and Transition Zones of the Barton Springs segment of the Edwards Aquifer, as well as additional area east of the Transition Zone in Travis, Hays, and Caldwell counties. The BSEACD regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2010). The drought management program allows the BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevations at an observation well.

Due to the connection between surface water and groundwater, additional regulations that protect surface water quality also affect groundwater quality. These regulations are discussed in **Section 9.3**.

Current Conditions

The Edwards Aquifer is one of the major aquifer systems in Texas, and the Barton Springs segment serves as either a sole source or a primary source of drinking water for approximately 60,000 people in Travis and Hays counties (Hunt et al., 2012b). The unique hydrogeology of the aquifer has produced a water source that is high quality, but also vulnerable to contamination. In addition, the aquifer provides habitat for a number of threatened or endangered aquatic and karst species, including the Barton Springs salamander (*Eurycea sosorum*) and the Austin blind salamander (*Eurycea waterlooensis*).

Within the Barton Springs segment of the Edwards Aquifer, four distinct zones are present: Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone. Estimates of the percentage of direct precipitation that contributes to recharge of the aquifer range from approximately six percent (Woodruff, 1984; Slade et.al., 1986) to approximately 31.5 percent (Hauwert, 2009). Surface water quality is an important factor that can influence groundwater quality in this area. Surface water quality is addressed in **Section 5.3.** The watersheds in the study area have been traced to a groundwater flow path, called the

Manchaca flow route. The Manchaca flow route has been linked to discharge at Main, Eliza, and Old Mill Springs of the Barton Springs complex (BSEACD, 2008). Barton Springs in south Austin is the most well-known outlet of the Barton Springs segment of the Edwards Aquifer. Water quality at the springs is of interest for several reasons: the springs system supplies a 750-foot-long swimming pool visited by more than 450,000 people each year (COA, 2009), and provides habitat for two federally listed species (Barton Springs salamander and Austin blind salamander). Barton Springs is located approximately 9 miles north of the study area.

Within the Barton Springs segment of the Edwards Aquifer, the COA owns or controls over 27,600 acres that are designated WQPLs (COA, 2014; Thuesen, 2013). These lands were purchased using funds from two utility bonds approved in 1998 and are managed to provide optimal water yield and to protect both water quality and quantity recharging in these areas (LBJWC, 2010). The WQPLs are located within the Barton Springs segment Recharge and Contributing Zones; currently 22 percent of the Recharge Zone and 7 percent of the Contributing Zone within the Barton Springs segment of the Edwards Aquifer is protected through the WQPL program (Thuesen, 2013).

Approximately 8,900 acres of land within the groundwater RSA are designated for protection as a part of the Balcones Canyonlands Preserve (BCP). The BCP is set aside for endangered species habitat as required in the Balcones Canyonlands Conservation Plan (BCCP), a habitat conservation plan developed by the COA, LCRA and Travis County for the acquisition of a regional permit allowing incidental take of covered species. Species covered under the BCCP include the Golden-cheeked Warbler, Black-capped Vireo, and six endangered karst invertebrates. The preserve is also designed to protect 27 species of concern, including 25 karst invertebrates and two plants. The preservation of BCP lands positively influences water quality as the land is protected from development or degradation.

A severe drought from 2011-present has caused lower water levels in the aquifer (Hunt et al., 2012a; BSEACD, 2013). Rainfall in 2013 provided some respite from the worst drought conditions, but the BSEACD continues to monitor well levels and discharge rates at Barton Springs. On October 24, 2013 the drought status was changed from Stage III Critical to Stage II Alarm (BSEACD, 2013). Under Stage II Drought restrictions, monthly pumping from water supply wells must be reduced at least 20 percent and a maximum monthly water use of 4,000 gallons per person is suggested.

Trends

Groundwater Quality

Results of water quality studies of Barton Springs are good indicators of the health of discharge from the Barton Springs segment of the Edwards Aquifer. While Barton Springs generally has high-quality water, concern regarding water quality is warranted due to the

vulnerability of karst aquifers to contamination and the rapid urbanization in the area (Small et al., 1996; Sharp, 2010).

An early study of groundwater quality in Travis County found that groundwater was of overall good quality, but recommended establishing a network of water-quality observation wells (Brune and Duffin, 1983). Slade et al. (1986) studied water quality in streams, wells, and springs in the Barton Springs segment and concluded that "the quality of water in the Edwards Aquifer is generally very good" and that "no regional contamination problems have been identified by this water-quality sampling program." This and subsequent studies analyzed a variety of constituents, including nutrients, physicochemical properties, indicator bacteria, major ions, trace elements, hydrocarbons, and pesticides.

The city of Austin and surrounding areas have grown rapidly since the early 1980s, and the COA has monitored the aquifer and Barton Springs to determine the effects of urbanization on water quality. In 2000, COA staff analyzed water quality sampling data taken between 1975 and 1999. These data indicated a statistically significant change in specific conductance, sulfate, turbidity, total organic carbon, and dissolved oxygen – all of which researchers linked to increased urbanization (Turner, 2000). However, it should be noted that significant trends were not observed in other constituents that are commonly considered pollutants, such as nutrients or total suspended solids (TSS). A later study of water quality over time at Barton Springs and other, related springs found similar trends of decreasing dissolved oxygen and increasing conductivity over time (Herrington and Hiers, 2010). This study also measured increases in nitrate concentrations; the trends related to dissolved oxygen and nitrates were of particular concern due to the potential for impacts on both the Barton Springs salamander and aesthetic impairments in the swimming pool (Herrington and Hiers, 2010).

In response to concerns following an *Austin American-Statesman* article about the quality of water at Barton Springs, the COA closed the Barton Springs Pool and sought a health consultation from the U.S. Department of Health and Human Services (DHHS) in 2003. DHHS evaluated twelve years of data collected by USGS, COA, LCRA, and TCEQ, and assessed the public health risk associated with human exposure to 27 potential contaminants identified. DHHS concluded that there was no information to support the contention that swimming every day in Barton Springs Pool would result in adverse health effects and that swimming in Barton Springs Pool posed no apparent public health hazard (DHHS 2003). A study conducted by TCEQ and EPA in the same year found that sediments from Barton Springs Pool were not toxic and that pollutants were present at levels typical of urban waterbodies (TCEQ, 2003).

Barton Springs Pool is often closed after storm events for maintenance and cleaning. Rainfall has been observed to influence both the quantity and quality of discharge at Barton Springs. A USGS study found that, under stormflow conditions, concentrations of nitrate and several major ions decreased, likely due to dilution of these constituents (Mahler et al., 2006). "Concentrations of other constituents, including TSS, potassium, and herbicide and insecticide

components, were found to increase following storm events (Mahler et al., 2006)." During a wetter-than-normal period (September 2009-March 2010), increased levels of nitrogen and major ions and decreased densities of bacteria were observed in Barton Springs discharge (Mahler et al., 2011b). These values were correlated with conditions in recharging streams, demonstrating the influence of streamflow and climatic conditions on Barton Springs water quality.

During the early 2000s, anthropogenic contaminants, including atrazine (an herbicide), chloroform (a drinking-water disinfection by-product), and tetrachloroethene (a solvent), were recorded in low concentrations at Barton Springs (Mahler et al., 2006). Routine sampling also identified the frequent occurrence of three other herbicide compounds – DEA (an atrizine degradate), prometon, and simazine – and potassium (associated with fertilizer). However, routine sampling did not reveal insecticide or fungicide compounds. Trace metals associated with both human-derived and natural sources were also detected. All of these constituents were detected well below drinking water standards (Mahler et al., 2006). However, this study demonstrated the influence of water quality in recharging streams on water quality at Barton Springs, even during non-stormflow conditions.

More recent studies have characterized concentrations of nitrate and wastewater compounds in the Barton Springs segment and their potential relation to wastewater sources in the Contributing Zone. Nitrate concentrations in Barton Springs and the five streams that provide most of its recharge were much higher during 2008-2010 than before 2008 (1990 to 2008, USGS data) (Mahler et al., 2011a). This nitrate is likely biogenic nitrogen (from human or animal waste, or both), and septic systems and land-applied treated wastewater effluent are likely sources contributing nitrate to the recharging streams (USGS, 2011). Elevated nitrate concentrations likely resulted in part from the transition from dry to wet conditions in fall 2009, but similar transitions also occurred during 1990-2008, indicating that increased nitrogen loading associated with population growth was likely also a contributing factor (Garner and Mahler, 2007; USGS, 2011). Excessive levels of nitrates and other wastewater compounds can cause algal blooms, which can decrease dissolved oxygen levels and threaten other aquatic species (USGS, 2011). As the population over the Barton Springs Contributing and Recharge Zones is projected to double between 2010 and 2035, the direct discharge of treated wastewater into Contributing Zone streams is anticipated (USGS, 2011). Currently, at least one permit has been issued for direct discharges of wastewater in the Bear Creek watershed (USGS, 2011).

The COA has acquired over 27,600 acres as designated WQPLs since 1998, and is continuing to purchase land that may benefit groundwater quality. In 2012, Austin voters approved Bond Proposition 13, which provided $30,000,000 to the City for funding the purchase of land in the Barton Springs segment contributing and Recharge Zones, the arrangement of conservation easements to protect water quality, and the preservation of open space in perpetuity (COA, 2013d). Tracts of land targeted for purchase or easement may include those that would protect aquifer recharge waters, preserve water quality, preserve critical baseflows,

and provide a contiguous buffer where tracts are located next to land with existing protection and other public land (COA, 2013d).

Despite the overall good water quality of Barton Springs, the presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water detected by researchers over the past few decades signify potential effects of growing regional urbanization on aquifer water quality. Urbanization has been identified as one of the most significant sources of water quality degradation that can affect the future survival of central Texas salamanders (USFWS, 2013). Specific constituents that could affect salamanders or their habitat include polycyclic aromatic hydrocarbons (which originate from petroleum products or atmospheric deposition), pesticides, and nutrients, as well as changes in water chemistry (including conductivity, salinity, and dissolved oxygen) (USFWS, 2013). Monitoring of water quality in the Barton Springs segment of the Edwards Aquifer is ongoing by the BSEACD, USGS, and COA. As the proposed project would occur in the Recharge and Transition Zones of the Barton Springs segment, the cumulative impacts of the project on this sensitive resource and on listed salamander species will be evaluated.

Groundwater Quantity

The Barton Springs segment of the Edwards Aquifer provides water for a variety of uses including industrial, agricultural, municipal, recreation, and private wells. These uses collectively account for the discharge component of the aquifer's water budget. As discussed above, recharge occurs predominantly in stream channels, and is therefore heavily influenced by contributing streams. Water levels in the aquifer have been monitored with increasing regularity since the mid-1800s, and springflow discharging from Barton Springs has been measured continuously since 1917 (Scanlon et al., 2001; Hunt et al., 2012b). Increased interest in the availability of water in the aquifer arose during the seven-year drought of the 1950s, during which record low springflow was recorded at Barton Springs (Brune and Duffin, 1983). More recent trends in groundwater quantity are discussed in the remainder of this section.

Springflow discharging from Barton Springs is often used to evaluate the overall water levels of the Barton Springs segment of the Edwards Aquifer, and is closely monitored by a number of agencies. The long-term average springflow at Barton Springs is 53 cubic feet per second (cfs) (Scanlon et al., 2001; Hauwert et al., 2004). Mahler et al. (2006) and the COA define low flow as below 40 cfs; the BSEACD declares Alarm Stage Drought when the 10-day average of Barton Springs is equal to or below 38 cfs (Hunt et al., 2012a). Critical Stage Drought is declared when the 10-day average is equal to or below 20 cfs.

Fluctuations in water level in the Barton Springs segment of the Edwards Aquifer represent changes in storage due to hydrologic stresses (Hunt and Smith, 2006). These fluctuations are due to a combination of seasonal and long-term (months to years) climatic changes that influence recharge via precipitation and anthropogenic changes in recharge and

discharge rates (Hunt and Smith, 2006; Mahler et al., 2006). Water levels are generally lowest during extended periods of drought (Brune and Duffin, 1983), as was observed during the severe drought conditions in 2011. During this period, the Austin area received only 33 percent of its average annual precipitation total, and diminished streamflow led to reduced recharge, lowering water levels in the aquifer and decreasing springflow at Barton Springs to Critical Stage Drought levels (Hunt et al., 2012a).

Recharge and discharge rates to the aquifer are influenced by a variety of anthropogenic factors. Pumpage removes water from the aquifer and can decrease discharge rates at springs, while recharge may be decreased by (1) increasing pumpage capturing groundwater upstream of contributing streams, (2) increasing temperatures and evapotranspiration rates, thereby reducing recharge, and (3) land-use practices that increase rates of evapotranspiration (Hunt et al. 2012b). In 1983, Brune and Duffin found that groundwater discharge (the sum of springflow and groundwater pumpage) was approximately equal to average annual recharge. However, more recent studies performed by the BSEACD have demonstrated the need for a reduction in pumpage from the Barton Springs segment of the Edwards Aquifer during periods of extreme drought to protect water wells from going dry and to maintain the quantity and quality of flow at Barton Springs (Smith and Hunt, 2004). Smith and Hunt (2004) used groundwater models to predict that, with projected pumping and a recurrence of drought-of-record conditions, springflow at Barton Springs would be greatly diminished or stopped. Additionally, under these conditions, as many as 19 percent of all water supply wells in the District could be negatively impacted and the potential for saline water to flow into the freshwater aquifer would increase (Smith and Hunt, 2004).

The contribution of recent recharge to spring discharge has been the subject of numerous recent studies. Mahler and Garner (2009) reported that recharge water contributed from 0 to 55 percent of spring discharge during non-stormflow conditions, while Mahler et al. (2011b) found that stream recharge contributed about 80 percent of Barton Springs discharge during a wetter-than-normal period. The rate of groundwater flow within the Recharge and Transition Zones has been studied using dye trace simulations. One study found an average travel time of five to eight days from injection sites to Barton Springs (Hauwert, 2012), while other studies have found that water is discharged at Barton Springs within two to four days of dye injection (BSEACD, 2003; Hunt et al., 2013). Groundwater flow rates are correlated to springflow rates, and vary under differing climatic conditions (BSEACD, 2003).

Mean annual springflow from Barton Springs has increased over the period of record, indicating increased water within the Edwards Aquifer over time (Hunt et al., 2012b). At Barton Springs, both median flow rates and high-flow percentiles have been increasing over the last 30 years. At the same time, low flow rates have decreased and variation in flow rates has increased, resulting in relatively little change to total discharge (Hunt et al., 2012b). These low flows are directly related to increased pumping from the aquifer (Hunt et al., 2012b). Pumping from the Barton Springs segment has increased dramatically in recent years, from less than

2,000 acre-feet per year in 1970 to approximately 5,700 acre-feet per year in the mid-2000s (Brune and Duffin, 1983; Hunt et al., 2012b).

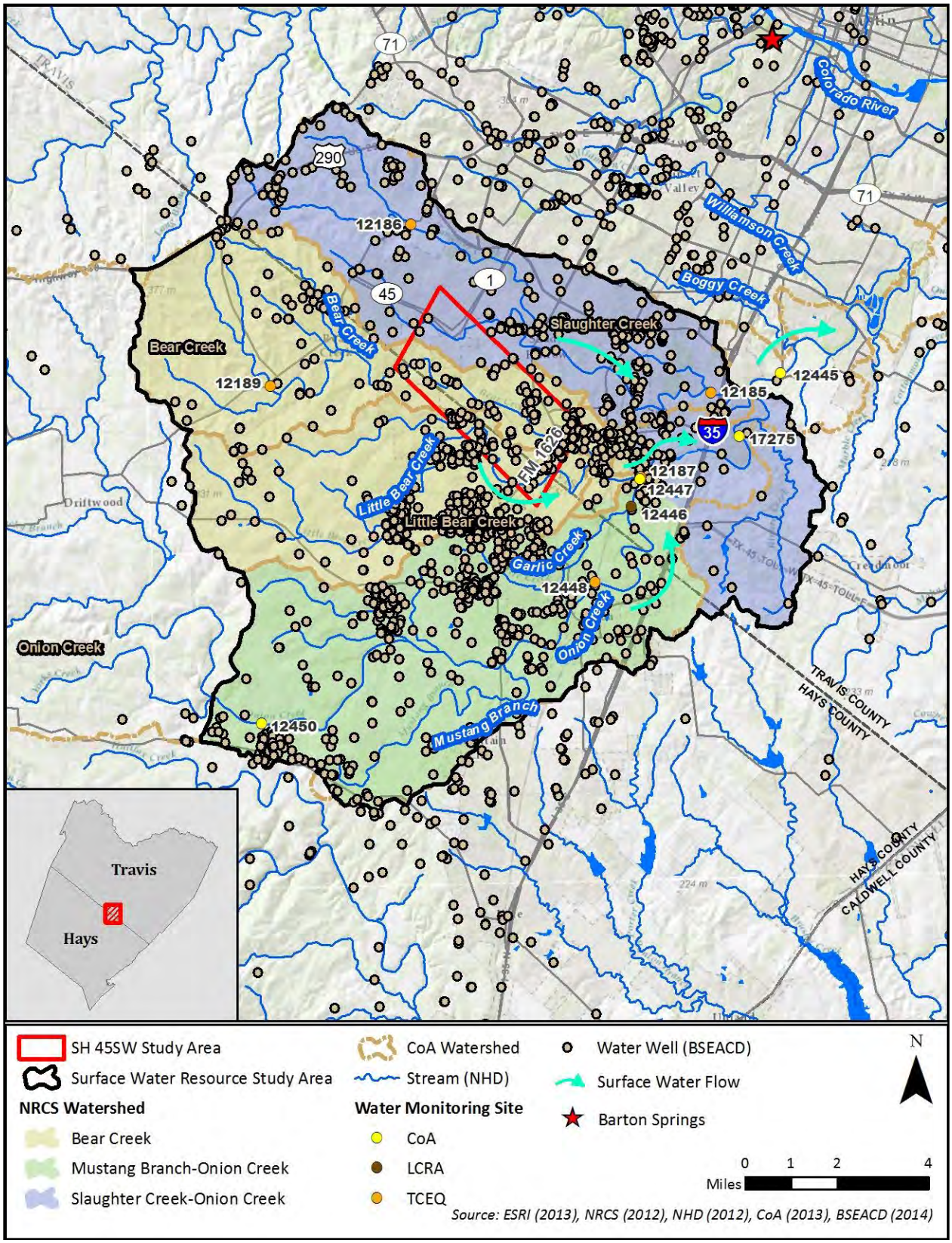
Future water use is difficult to project because of unpredictable weather conditions and the potential for alternative water supply scenarios. However, it has been found that water levels will decline in response to projected future pumpage and potential future drought conditions (Scanlon et al., 2001). Simulated spring discharge decreased in proportion to future pumpage, but was reduced to 0 cfs in a simulation of future pumpage under severe drought conditions (Scanlon et al., 2001). These findings have led the BSEACD to evaluate alternative sources of water for the growing population of central Texas (Smith et al., 2013).

5.3 Surface Water

The geographic RSA for cumulative effects to surface water is based on the boundaries of three general watersheds that intersect the SH 45 SW Study Area as delineated by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) (Bear Creek, Mustang Branch-Onion Creek, and Slaughter Creek-Onion Creek) totaling approximately 87,871 acres. The watershed boundaries were selected for the RSA because all surface water runoff in the project study area (and the anticipated growth areas surrounding the study area) would be contained within the geological features that define the boundaries of these watersheds. The physical boundaries of the RSA lie roughly from Slaughter Lane near US 290 south of the Travis/Hays County border along US 290 then south/southeast to FM 150 and northeast between the cities of Kyle and Buda to near Creedmoor (**Figure 5-5**).

Onion Creek is a common drainage for the three watersheds in the RSA. Two of the watersheds contain segments of Onion Creek, which are named based on the major tributaries that join each segment. The Bear Creek watershed does not include a segment of Onion Creek, but Bear Creek is also a tributary of Onion Creek. The segment of Onion Creek that is the furthest upstream in the RSA is within the Mustang Branch-Onion Creek watershed. The furthest downstream segment of Onion Creek in the RSA, Onion Creek-Slaughter Creek, begins below the confluence of Onion Creek and Bear Creek.

Figure 5-5: Resource Study Area for Surface Water



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Encompassing 27,180 acres, the Mustang Branch – Onion Creek watershed contains the most upstream segment of Onion Creek in the RSA. This segment of Onion Creek flows in a northeasterly direction and is joined by several tributaries including Mustang Branch from the south and Garlic Creek from the north. In total, approximately 86 linear miles of creeks flow through this watershed. According to the Ecological Mapping System of Texas (EMST), a land use mapping service, 2,698 acres (10 percent) of the land in this watershed is classified as "Urban High Intensity" or "Urban Low Intensity" (EMST, 2012). This is the least amount of land with these classifications of all the watersheds in the RSA. The cities of Austin, Buda, and Mountain City all have various levels of jurisdiction over some parts of the watershed. A Full Purpose Jurisdiction area is incorporated land within city limits that is subject to all taxes, services, laws, etc. Beyond this area typically lie various Extraterritorial Jurisdictions where a particular city will have sole annex rights and may extend certain ordinances, codes, and other regulations that, for example, influence land development. Only 2,730 acres (10 percent) of COA Extra Territorial Jurisdiction area lies within the watershed. Approximately 2,870 acres (11 percent) of Mountain City and the City of Buda are also within the watershed (**Figure 5-6**).

The Bear Creek watershed, which is the largest in the RSA encompassing 32,340 acres, lies to the north of the Mustang Branch-Onion Creek watershed. Bear creek is the primary path of surface water drainage for the watershed, especially for the northern portions. Bear Creek is joined from the south by Little Bear Creek, which drains a large area in the south of the watershed. Both Bear Creek and Little Bear Creek flow in an easterly direction, and in total, approximately 116 linear miles of creeks lie within this watershed. The COA, City of Hays, and the community of Bear Creek cover approximately a third of the RSA. Approximately 1,873 acres (5 percent) of the RSA is under COA Full Purpose Jurisdiction. COA Extra Territorial Jurisdictions cover an additional 10,515 acres (33 percent) of the RSA. The communities of Hays and Bear Creek encompass 135 acres and 685 acres respectively (approximately three percent). Due to the limited extent of development and corresponding city jurisdiction in the area, the Bear Creek watershed only contains 2,983 acres (9 percent) of "Urban High Intensity" and "Urban Low Intensity" areas as defined by the EMST (**Figure 5-6**).

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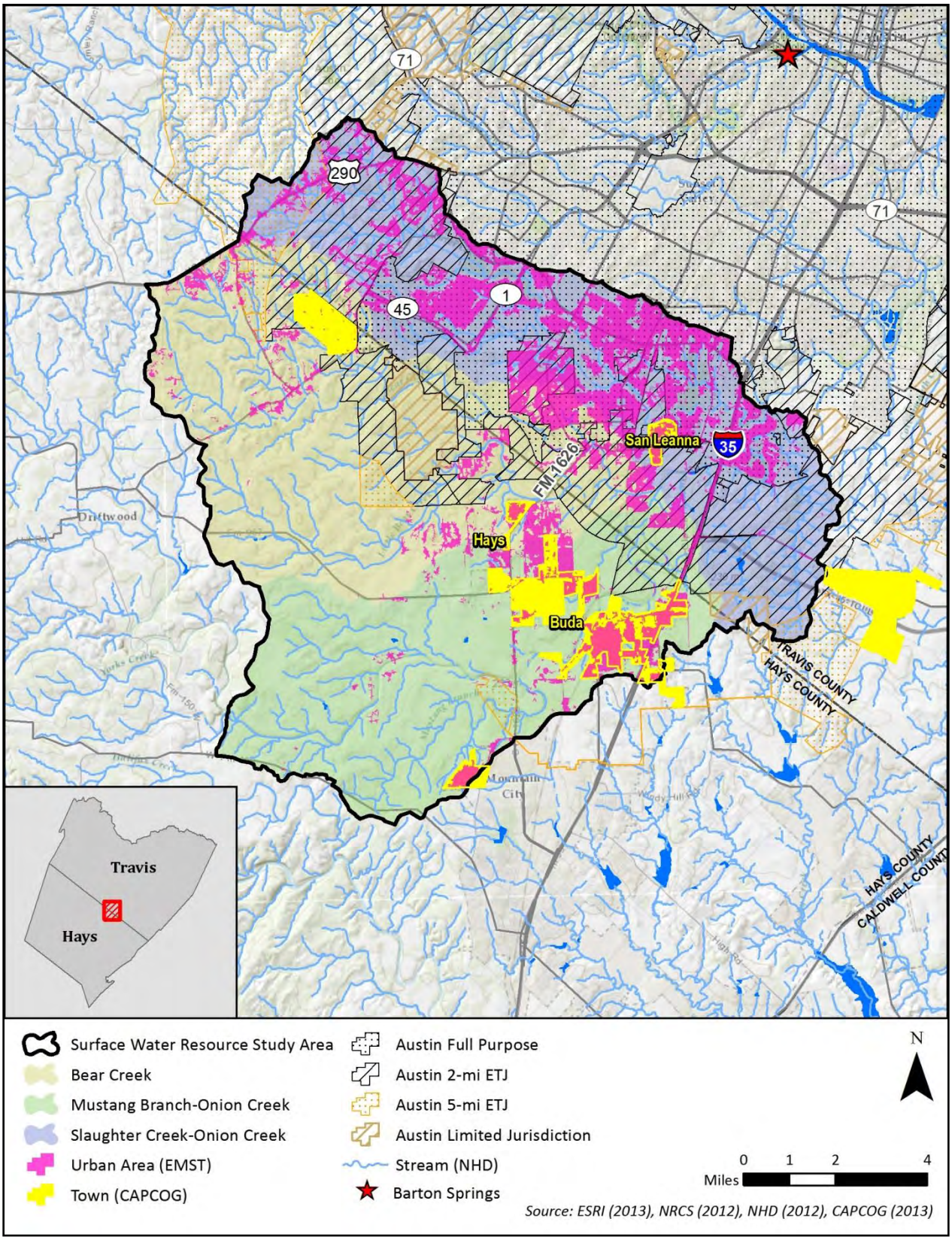
Figure 5-6: Urbanized Areas in the Resource Study Area



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Encompassing 28,351 acres, the Slaughter Creek – Onion Creek watershed is the northernmost watershed in the RSA. Onion Creek flows into this watershed immediately below its confluence with Bear Creek and flows out of this watershed shortly after being joined from the south by Rinard Creek and from the north by Slaughter Creek. All surface water draining from the RSA ultimately flows through this outflow point on Onion Creek. Onion Creek flows from the RSA in a northeasterly direction toward its confluence with the Colorado River approximately 10 linear miles away. Slaughter Creek flows from the northern part of the Slaughter Creek-Onion Creek watershed in a southeasterly direction toward its confluence with Onion Creek, draining approximately 70 percent of the watershed. Rinard Creek drains approximately 20 percent of the watershed at the southernmost portion of the watershed Major creeks in the watershed include Slaughter Creek and three of its tributaries, Rinard Creek flows northward toward its confluence with Onion Creek from the south of the watershed. In total, approximately 103 linear miles of creeks lie within this watershed. This watershed is the most developed of the three watersheds in the RSA. The City of Austin and the Village of San Leanna boundaries encompass 100 percent of the watershed. Approximately 12,733 acres (45 percent) are under COA Full Purpose Jurisdiction. The Slaughter Creek-Onion Creek watershed contains 8,753 acres (31 percent) of “Urban High Intensity” and “Urban Low Intensity” land use areas (EMST, 2012) (**Figure 5-6**)**.**

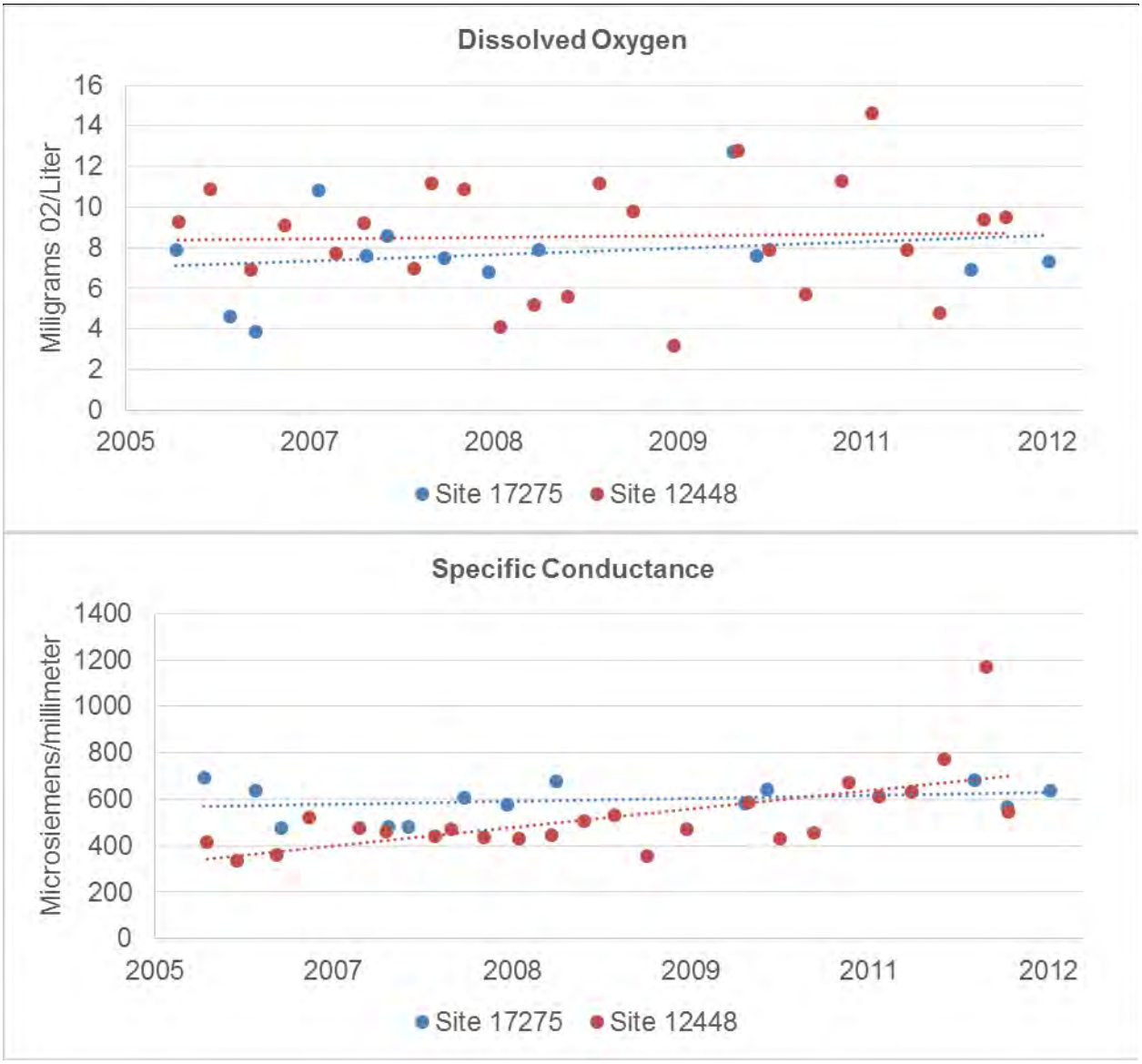
Environmental management and monitoring took root in the U.S. in the 1970s with creation of the EPA in 1969. The Clean Water Act was passed in 1972, followed by the Texas legislature’s creation of Texas Department of Water Resources and the Texas Water Development Board. The subsequently named TCEQ began monitoring water quality around that time in partial recognition of the connection between population growth and environmental resources. The earliest temporal boundary for the surface water RSA dates from 1979 (the earliest point at which water quality sampling data collected by the Texas Commission on Environmental Quality (TCEQ) is available). The future temporal horizon is 2035 (the horizon year of the long range transportation plan, *CAMPO 2035 Long Range Transportation Plan*). Historical water quality data within the RSA are presented below in order to define the health of the resource and establish historical trends. Surface water and groundwater quality are closely related within this karstic recharge zone, and threats to one can quickly affect the other, as well as potentially affecting the two federally endangered species of salamander found primarily within Barton Springs that depend on water quality to survive.

Current Conditions

The COA Department of Watershed Protection, the LCRA, TCEQ, and USGS, among others, monitor water quality in locations throughout the study area. Each entity reports their findings in various ways including the LCRA Water Quality Index, the TCEQ Integrated Report for Surface Water Quality, and the COA Environmental Integrity Index.

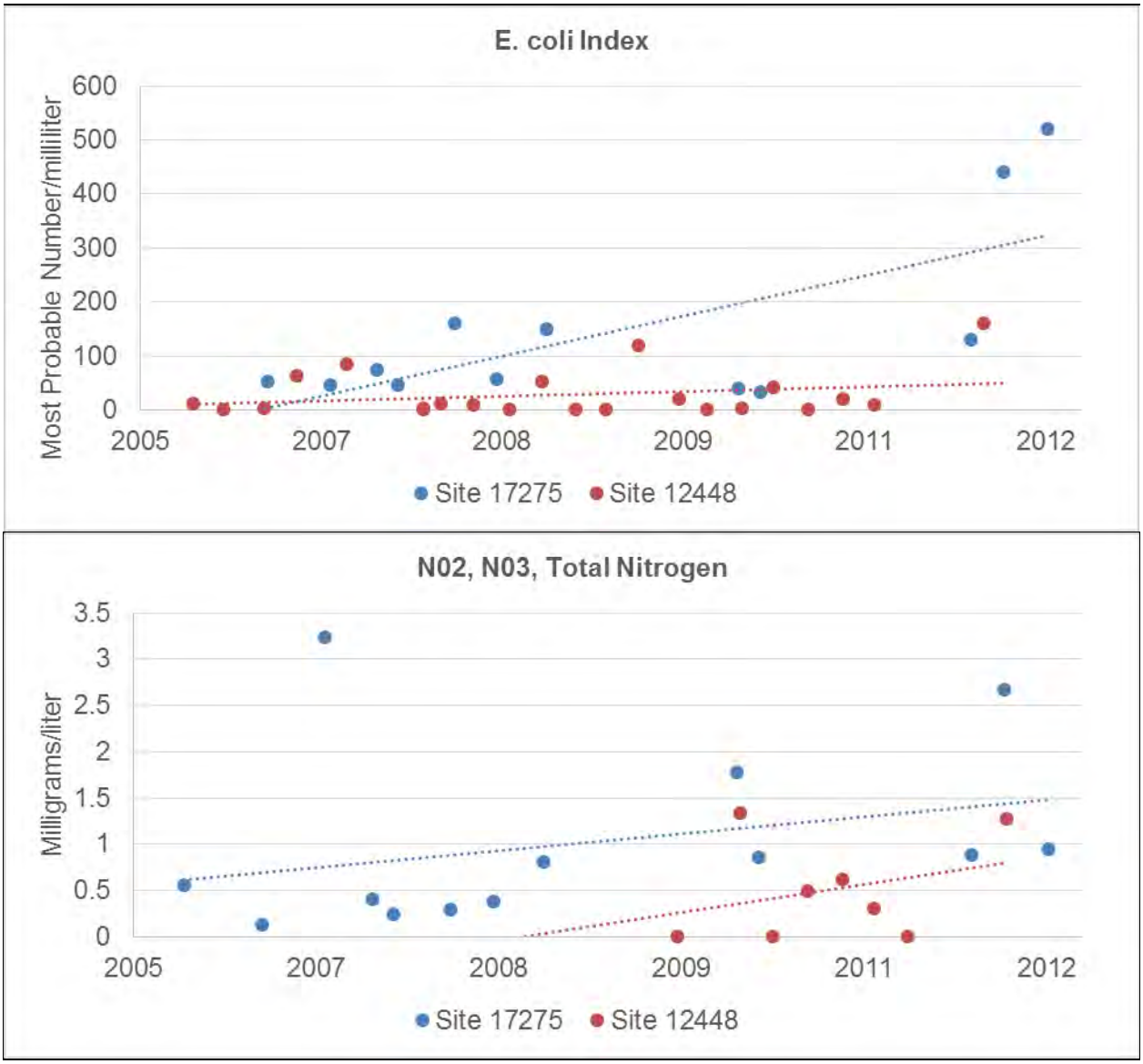
The LCRA offers access to raw data from various water quality monitoring programs including a number of cooperative monitoring efforts with other agencies. Some data are part of long-term monitoring programs and others are the result of ad hoc sampling events in response to special circumstances. While many of the sites within the RSA offer sporadic results, the site with the most complete data set is from Site 12448 (see **Figure 5-7**), which is located north of Buda, approximately halfway down the length of Onion Creek in the RSA, and as such, is influenced heavily by water quality in the Upper Onion Creek watershed. The data set from Site 17275, which is situated at the lowest point in the RSA, is less extensive but offers insight to changes in values across the RSA. The most recent data collected at these two sites for dissolved oxygen and *E. coli* show that the parameters are well within the allowable limits established by TCEQ Surface Water Quality Standards. Nitrate levels are similar to those reported elsewhere (Mahler, 2011a). It should be noted, however, that values may change in relation to creek flow levels and flow data. Specific conductance values are recorded and are presented in **Figure 5-7** below. Values indicate that, with one exception, recent measurements are similar to measurements taken over the last six years. Specific conductance is linked to salamander abundance at Barton Springs (USFWS, 2013), and increased levels have been correlated to salamander mortality in other related species (USFWS, 2005). Conductance in surface water naturally increases as contact time with soil and stream bed substrate increases and substrate materials are dissolved by and into the water. It also increases due to man-made factors such as some pollutants and in response to changes in flow patterns. Specific conductance in spring flow is mediated by complicated interactions dependent on the relative contributions to total discharge of (1) recently recharged rainwater, (2) water that has been in contact with stream and aquifer substrates longer, and (3) water from the Saline Zone of the aquifer (listed by increasing typical specific conductance values) (Mahler, 2006). Surface water specific conductance values provide context for the spring flow quality.

Figure 5-7: Recent Water Quality Trends (LCRA Testing Sites)



Source: LCRA, 2013

Figure 5-7 (cont.): Recent Water Quality Trends (LCRA Testing Sites)



Source: LCRA, 2013

TCEQ's Integrated Report is published every other year and includes the Section 303(d) list, which is an EPA-mandated list of waterbodies that are categorized as "impaired" when they do not meet pre-determined water quality standards. Impairment is determined in relation to beneficial uses that each waterbody segment is expected to provide, and sampling protocols vary, in part, by the assigned uses. Current use designations in the RSA include Aquatic Life Use (the ability of the waterbody to support various aquatic organisms), General Use, Recreational Use (which can be differentiated into contact and non-contact recreation), and Public Water Supply Use Sections of Onion Creek, including sections in the RSA which are designated as Aquifer Protection Use (See **Table 5-1**). The Aquifer Protection Use segments are placed under additional scrutiny and are monitored for four key constituents that indicate drinking water supply health, which are discussed in more detail below. In 2012, Segment 1427A (Slaughter Creek) was listed as impaired relative to the macrobenthic community. The macrobenthic community is made up of species of aquatic organisms such as insects, mollusks, and other invertebrates (e.g. worms, leeches, etc.) which are visible to the un-aided eye (macro-) and live out some or all of their life at the bottom (benthos) of the waterbody. The types and number of species present are indicators of water quality, and the community is sampled for its usefulness in indicating a waterbody's capability to support the Aquatic Life Use category. The macrobenthic community is susceptible to a wide array of stressors including man-made pollutants and natural weather patterns such as flood and drought.

Table 5-1: Designated Beneficial Uses of Watersheds in Study Area

Watershed	Aquifer Protection Use	Public Water Supply Use	Recreation Use	Aquatic Life Use	General Use
Mustang Branch-Onion Creek	Y	Y	Y	Y (High)	Y
Bear Creek	N	N	Y	Y	Y
Slaughter Creek-Onion Creek	N	N	Y	Y	Y

Source: (USGS, 2013; TCEQ 2012a)

The COA Watershed Protection Department samples water quality parameters in 49 watersheds within the COA's planning area to compile an Environmental Integrity Index (EII). The Watershed Protection Department recognizes slightly different watershed delineations than those represented in the RSA. Most notably, the COA separates Bear and Little Bear Creeks and includes the entirety of the Onion Creek Watershed, as shown in **Figure 5-5**. Nonetheless, water quality data are representative of current water quality in the RSA. Every other year the monitoring results are scored and assigned relative values. In addition to individual parameter scores, an overall EII score is assigned. Data are collected for dissolved oxygen, pH, conductivity, ammonia, nitrate, ortho-phosphates, TSS, turbidity, *E. coli*, benthic

macroinvertebrates, and diatoms. The scores are ranked “Very Bad”, “Bad”, “Poor”, “Marginal”, “Fair”, “Good”, “Very Good”, and “Excellent.”

- In 2012, the overall EII score for the Slaughter Creek watershed was 70 (Good). All parameters collected resulted in normal ranges except for pH which had some low values, and low concentrations of dissolved oxygen at a downstream site.
- In 2012, the overall EII score for the Bear Creek watershed was 69 (Good). Some low values of dissolved oxygen, pH, and ortho-phosphates were measured. Some high values of nitrate were measured. Other parameters were within normal range.
- In 2012, the overall EII score for the Little Bear Creek watershed was 77 (Very Good). Low values of dissolved oxygen, pH, ammonia, and *E. coli* were measured. Other parameters were within normal range.
- In 2012, the overall EII score for the Onion Creek watershed was 80 (Very Good). Dissolved oxygen had some values outside of the normal range at a site downstream from the RSA. Other parameters that had some measurements outside of the normal range include pH, conductivity, and ammonia. Other parameters were within normal range.

Trends

Regulatory History

The COA has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. The first of these, the Lake Austin Watershed Ordinance, was adopted in 1980 and included provisions addressing impervious cover limits, water quality and quantity structural controls, and a requirement for an erosion/sedimentation control plan prior to subdivision application approval (COA, 1980). Subsequent ordinances added provisions for stream set-back requirements, a water quality zone to remain free of most development types, protection of watersheds that do not provide drinking water, and the designation and protection of critical environmental features (COA, 2013c). The Save Our Springs Ordinance, which was adopted in 1992, required non-degradation and limited impervious cover to 15 percent for all development in the Recharge Zone, 20 percent for development in the Barton Creek portion of the Contributing Zone, and 25 percent for development in the remaining portions of the Contributing Zone in Williamson, Slaughter, Bear, Little Bear, and Onion Creeks, to be calculated on a net site area basis (COA, 2013c). The most recent watershed protection ordinance was passed in

2013; this ordinance aimed to improve creek and floodplain protection, prevent unsustainable public expense on drainage systems, simplify development regulations where possible, and minimize the impact on the ability to develop land (COA, 2013e). Within the Barton Springs segment of the Edwards Aquifer, the COA owns or controls development rights on over 27,600 acres that are designated WQPLs (COA, 2013d, 2014; Thuesen, 2013). These lands were purchased using funds from two utility bonds approved in 1998 and are managed to provide optimal water yield and to protect both water quality and quantity recharging into these areas (LBJWC, 2010). Additional bonds were passed in November 2012 (Proposition 13; Open Space and Watershed Protection). These lands are permanently protected from urbanization to preserve pervious cover and current hydrologic conditions. Several measures are listed in §13-7-36.4 of the SOS Ordinance that pertain to impervious cover limitations and construction within Critical Water Quality Zones (CWQZ) and Water Quality Transition Zones (WQTZ). A CWQZ is established along each waterway classified under Land Development Code (LDC) §25-8-91 (Waterway Classifications). The boundaries of a CWQZ may coincide with the boundaries of the 100-year floodplain, except under certain circumstances. A WQTZ is established adjacent and parallel to the outer boundary of each CWQZ. The width of a WQTZ is 100 feet for a minor waterway, 200 feet for an intermediate waterway, and 300 feet for a major waterway (LDC §25-8-93).

Surface Water Quality

Available impaired waterbody listings from within the RSA show that, in the past, causes of impairment have been varied. However, during the four most recent reporting cycles (eight years) only Slaughter Creek has been listed on the 303(d) list, and each listing was for Impaired Macrobenthic Communities. Isolated pools of water may become increasingly oxygen poor, especially during high temperatures, which can lead to conditions unfavorable to sensitive macrobenthic organisms. Decreased abundance of certain macrobenthic species can act as a bioindicator for poor water quality. The intermittent nature of Slaughter Creek makes its macrobenthic community especially susceptible to natural water availability changes. These macrobenthic communities are a measure of water quality but are not rare or endangered species.

Onion Creek is assigned an additional beneficial use category by TCEQ. The Aquifer Protection Use is associated with stricter standards for Total Dissolved Solids, Dissolved Oxygen, Sulfates, and Chloride. Dissolved oxygen levels should not fall below five mg/L and Sulfates and Chloride should not rise above 50 mg/L.

Figure 5-8 shows historical data from TCEQ water quality monitoring Site 12448 with Surface Water Quality Thresholds indicated by red lines.

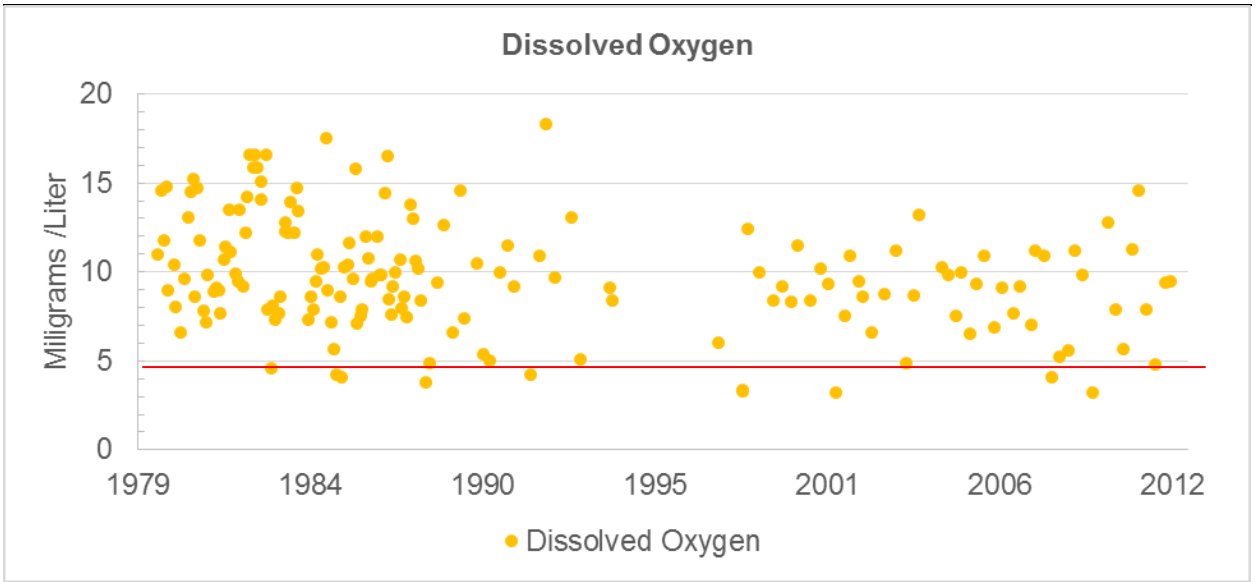
According to LCRA sampling data, recent general trends in key parameters in the lower watershed are relatively stable aside from a rise in the *E. coli* index. See **Figure 5-6**. Total

Nitrogen also shows slightly increasing numbers over time which could lead to future impairment.

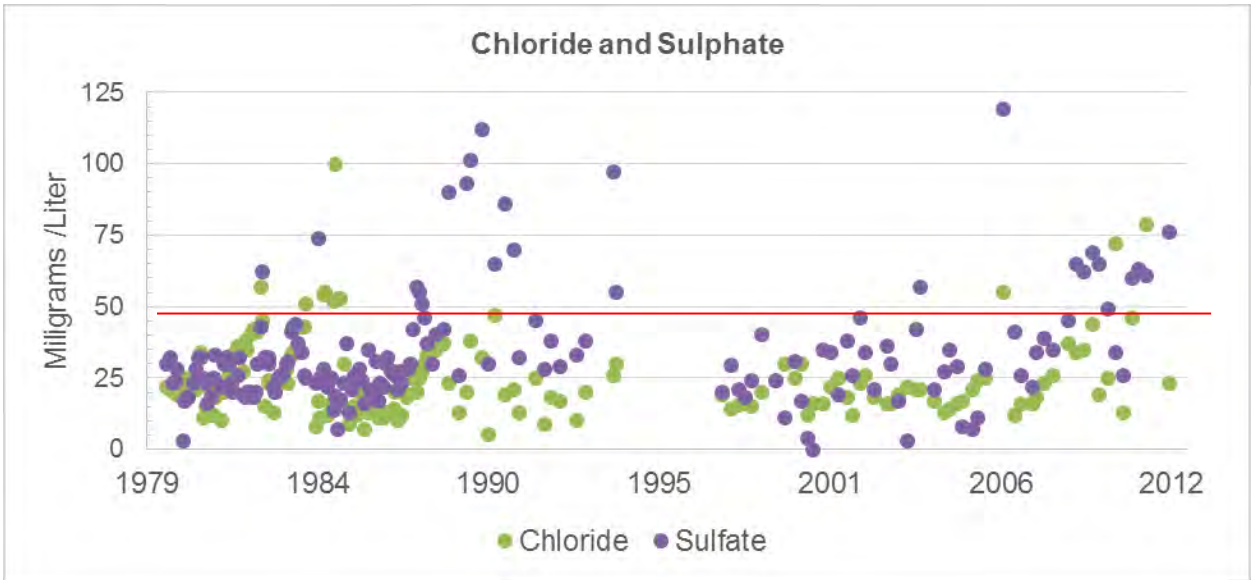
As **Figure 5-9** indicates, overall Environmental Integrity Index scores for the four COA watersheds have ranged from Good to Very Good throughout the program's history, with the majority of scores falling in the Very Good range. Finer scale changes in water quality over the past 10 years reflect an apparent pattern whereby overall scores have behaved similarly with respect to improving and declining trends. This may be due to overarching influences on water quality such as recent weather patterns, as opposed to land use and other watershed specific influences.

Water quantity is highly variable in the study area and can change significantly in a short time period. Streams outside of aquifer recharge zones typically receive water from the water table and are therefore more likely to sustain a base flow between rain events. Stream segments that flow through the aquifer recharge zone can lose a considerable portion of their flow to swallets. As shown in **Figure 5-10** and **Figure 5-11** flow in Onion Creek is often at or near zero, but it is punctuated by spikes of high flow that are typically of short duration. This "flashy" flow pattern may be exaggerated by impervious cover in a watershed, which usually increases the amount and velocity of rainfall runoff. Factors that influence the quantity of water in streams include weather (rain/drought) conditions and land use patterns. The extent of BMPs used by urban areas such as detention ponds and "grow zones" of vegetation next to creeks vary widely by the regulations set by local government.

Figure 5-8: Long Term Water Quality Data in Onion Creek



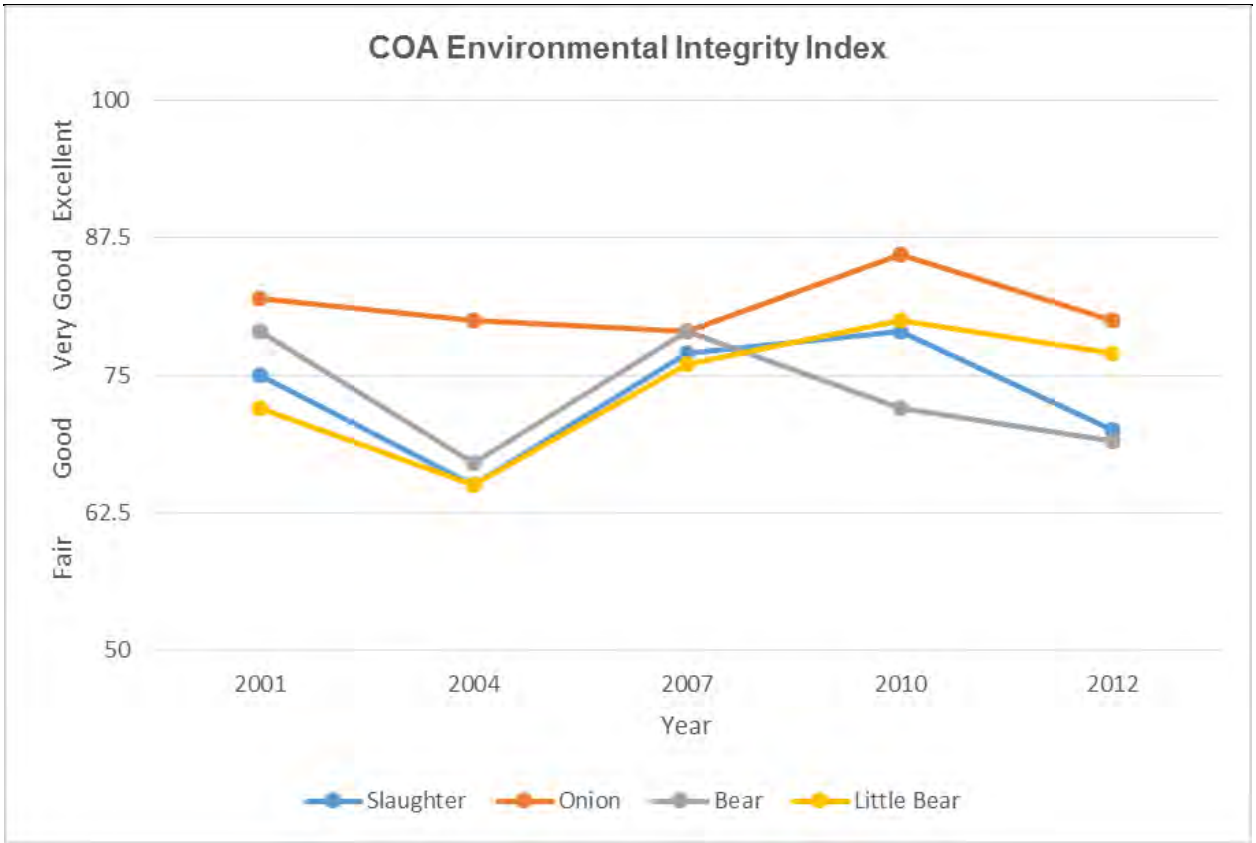
The majority of Dissolved Oxygen levels recorded in Onion Creek over the last several decades has been above the five mg/L minimum set by the Surface Water Quality Standards associated with the Aquifer Protection Use classification.



The majority of Chloride and Sulphate levels recorded in Onion Creek over the last several decades has been below the 50 mg/L maximum set by the Surface Water Quality Standards associated with the Aquifer Protection Use classification.

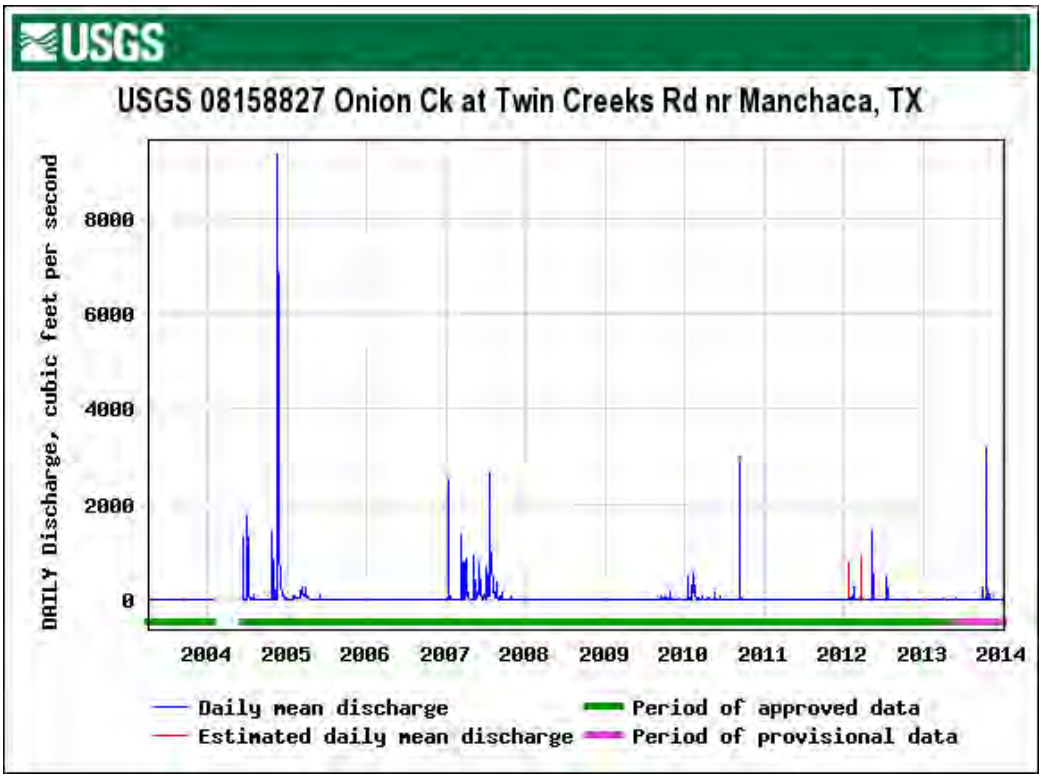
Source: LCRA, 2013; TCEQ, 2010

Figure 5-9: Environmental Integrity Index Trends



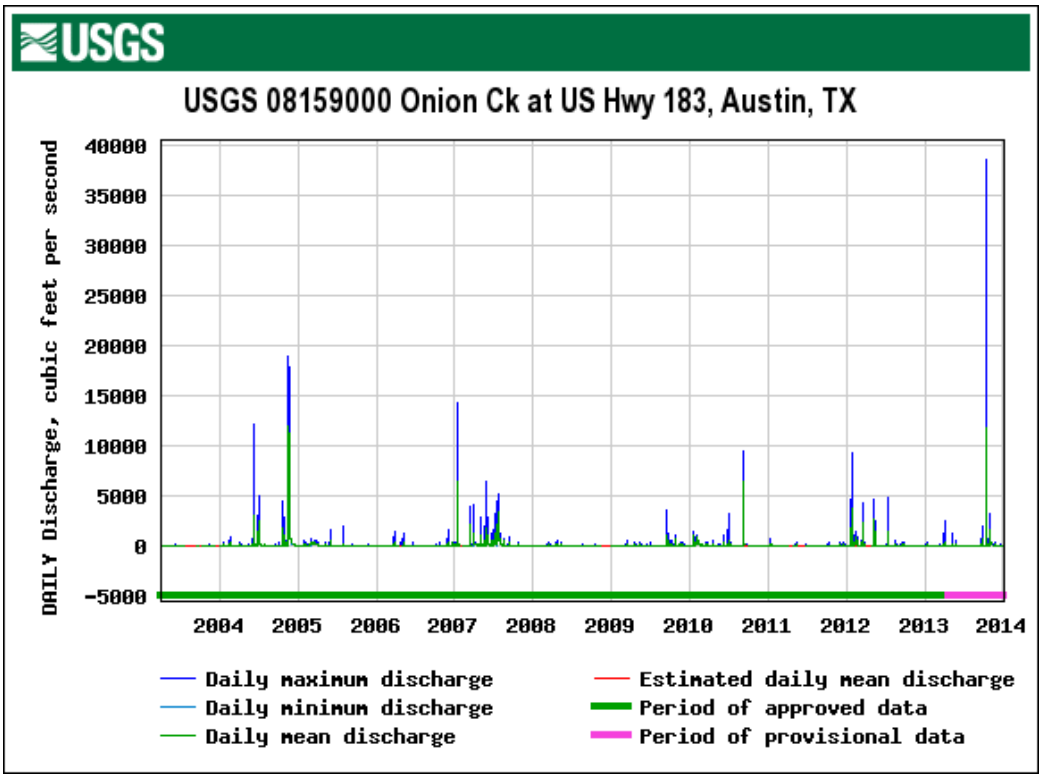
Source: COA, 2013g-Environmental Integrity Index.

Figure 5-10: Recent Flow Data from Middle Onion Creek Watershed



Source: USGS, 2013

Figure 5-11: Long Term Flow Data from Onion Creek Downstream of RSA



Source: USGS, 2013

Based on these various sources of data and surface water quality indicators, it appears that the health of the surface water resource has fluctuated over the past decades relative to water levels, droughts, development and impervious cover addition, influenced by increasing regulatory protection measures that have been put in place in the RSA, including acquisition and protection in perpetuity of the COA WQPLs. Despite these episodic fluctuations, the health of the surface water resource in the SH 45SW RSA appears to be stable.

6.0 Direct and Indirect Effects on each Resource from the Proposed Project

6.1 Threatened and Endangered Species

6.1.1 Golden-cheeked Warbler

Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, there are no effects to this species anticipated as a result of the proposed project.

Based on a review of acreage estimates from Texas A&M University (Texas A&M, 2010) and recent aerial photography, there are 13,275 acres of potential Golden-cheeked Warbler habitat within the geographic RSA. Approximately 447 acres of potential habitat is located on land for which developments have been proposed or are being constructed. Estimates of induced growth show that the potential exists for a maximum of 4,102 acres of potential Warbler habitat to be lost if that land was developed over the planning horizon. This acreage represents approximately 31 percent of the potential habitat available within the RSA. Developable land is defined as land that is not protected, set aside, or publicly owned. Approximately 33 percent of land in the RSA falls within COA WQPLs and 32 percent falls on “undevelopable” land. Any developments on developable land that could impact Golden-cheeked Warblers or their habitat would be subject to regulation under the ESA and may qualify for mitigation through the BCCP in Travis County or the Hays County HCP in Hays.

6.1.2 Austin Blind Salamander and Barton Springs Salamander Direct Impacts

There is no known appropriate habitat for either the Barton Springs salamander or the Austin blind salamander within the project study area. Therefore, no direct impacts to either species from the proposed project are anticipated.

As discussed in the ***Indirect Impacts Technical Report***, indirect impacts are not expected to occur to Austin blind or Barton Springs salamanders from the proposed project. The proposed project area is located over the Edwards Aquifer Recharge Zone. Stormwater runoff from the proposed project has the potential to enter the Edwards Aquifer and flow towards Barton Springs, which receives all of its water from the aquifer. Based on analysis of the groundwater flow routes in the area of the proposed project, runoff from the proposed project could be carried via the Manchaca flow route to Barton Springs. The Manchaca flow route has

been linked to discharge at Main, Eliza, and Old Mill Springs at Barton Springs, all of which are known to support populations of these two salamander species. Potential impacts to groundwater resources are discussed in more detail in **Section 5.2** of this Technical Report. BMPs would be incorporated into the project to prevent potentially contaminated runoff from entering the Edwards Aquifer. Implementation of robust BMPs during construction and operation of SH 45SW, including erosion controls, sediment controls, and post-construction TSS controls, would avoid or reduce impacts to water quality. Examples of BMPs that would be used during project construction include mulch logs, rock filter dams, and silt fences, which are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report.*** Potential hazardous material removal would be addressed through the use of several structural and non-structural BMPs, including the placement of hazardous materials traps and water quality ponds at key locations. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series with each in the line removing additional TSS and other pollutants, including the use of porous friction course (PVC) pavement, vegetated swales/filter strips, and water quality ponds. Pollutant removal rates through these "stacked" BMPs can exceed 90 percent, as discussed in the ***Water Quality and Aquatic Resource Protection Technical Report***.

There are approximately 9,387.3 acres of undeveloped, developable land (not already platted or planned for development) within the AOI of the project. Developments on these lands would adhere to the Edwards Aquifer Rules and TCEQ requirements as discussed in **Section 5.2**. Furthermore, any developments with the potential to impact the groundwater habitat of the protected salamander species could be subject to regulation under the ESA.

6.2 Edwards Aquifer/Groundwater Resources

Potential consequences of the proposed project may include the potential for runoff from the project site to affect the Barton Springs segment of the Edwards Aquifer through surface water drainage and groundwater recharge. Potential effects to groundwater resources include short-term potential for pollutants in stormwater runoff from the construction site to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; long-term potential for pollutants in stormwater runoff from the completed roadway, including from spills, to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; and potential for reductions in recharge to the Edwards Aquifer resulting from increases in impervious cover.

Erosion and sedimentation during construction of the roadway could have short-term, adverse effects on receiving waters in the RSA. Due to the potential for recharge to the Edwards Aquifer from the project area and areas downstream, BMPs would be utilized to prevent or reduce the pollution of runoff from the project area, including minimizing impacts to water quality as a result of erosion and sedimentation.

The proposed project would add impervious cover to the watersheds in the study area. Implementation of the Build Alternative would add a total of 51.6 acres of impervious cover, of which 48.1 acres (93.2 percent) would be added within the Recharge Zone. The addition of impervious cover would potentially increase runoff and slightly reduce recharge to the Barton Springs segment of the Edwards Aquifer. Highway stormwater runoff may contain a wide variety of possible pollutants potentially impacting surface and groundwater resources, including metals, solids, nutrients, bacteria, herbicides, and hydrocarbons such as fuel oils and gasoline (Barrett et al., 1995). BMP options continue to evolve and improve and would reduce adverse water quality impacts from stormwater runoff.

6.3 Water Resources - Surface Waters

The project area crosses Bear Creek and a tributary to Slaughter Creek. Based on preliminary design information, the creeks would be bridged. Permanent impacts to waters of the U.S. are not anticipated due to bridging and/or due to minimization of fill in waters of the U.S. No wetlands would be impacted. Temporary impacts to surface water quality would include potential stormwater runoff and contamination during construction. These impacts would be minimized through required utilization of robust BMPs during construction as detailed in the Water Quality Technical Report. Permanent BMPs proposed include PFC pavement, grassy vegetated swales, and hazardous material traps.

Approximately 66 linear miles of creeks lie within the AOI that could potentially be affected by stormwater runoff and pollutants, although regulations would apply as discussed in **Section 9.0**.

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7.0 Other Actions – Past, Present and Reasonably Foreseeable – and Their Effect on Each Resource

According to TxDOT's 2013 guidance, the cumulative effects analysis should include "the full range of other actions, not just transportation projects" with a focus on activities "that are likely or probably, rather than merely possible" (TxDOT 2013, FHWA 2003). In addition to researching various published documents and plans, a simple questionnaire explaining the project and requesting information about other actions was distributed to several entities including the cities of Dripping Springs, Kyle, Buda and Hays and Travis counties. Additional research was conducted to identify transportation plans and future land use plans in smaller communities such as Bee Cave. A map was included depicting a combination of all RSAs to capture the "combined RSA" in order to identify other actions within that study area.

One overarching trend that provides a backdrop for resource specific analysis is to look at population growth in the jurisdictions within the RSA. **Table 7-1** shows historical and current population in the RSA and **Table 7-2** shows projected population in the RSA. Both tables indicate substantial population growth. The cities of Kyle, Buda, and Bee Cave grew by especially large percentages in recent decades. Some cities in the RSA grew more in prior decades (1970s and 1980s) comparatively. Travis County more than doubled its population between 1970 and 2010, while Hays County's population quadrupled. Future population projections show that the cities of Buda and Sunset Valley, and Hays County overall, are expected to increase more than 100 percent between now and 2040.

Table 7-1: Current and Historic Population in Largest Resource Study Area

City or County	Total Population by Year					% Change from 1970-2010
	1970	1980	1990	2000	2010	
City of Austin	251,808	345,890	465,622	656,562	790,390	213.9%
City of Kyle	1,629	2,093	3,325	5,314	28,016	1,619.8%
City of Buda	498	597	1,795	2,404	7,295	1,364.9%
Mountain City	(Prior to incorp.*)	(Prior to incorp.*)	377	671	648	71.9%
Westlake Hills	1,488	2,166	2,542	3,116	3,063	105.8%
City of Dripping Springs	495	530	1,033	1,548	1,788	261.2%
Bear Creek	(Prior to incorp.*)	(Prior to incorp.*)	(Prior to incorp.*)	360	382	6.1%
Sunset Valley	292	428	327	365	749	156.5%
City of Rollingwood	780	905	1,388	1,403	1,412	81.0%
Bee Cave City	50	50	241	656	3,925	7,750.0%
Village of San Leanna	(Year of incorp.)	259	325	384	497	+ 91.9%
City of Hays	(Prior to incorp.*)	286	251	233	217	-24.1%
Travis County	295,516	419,573	576,407	812,280	1,024,266	246.6%
Hays County	27,642	40,594	65,614	97,589	157,107	468.4%

*Sources: Texas State Library and Archives Commission, 2013; Texas Almanac 1980-81; COA 2013a-Population History; Texas State Historical Association; Cecil and Greene; U.S. Census Bureau 1990. *Census information is unavailable for unincorporated communities.*

Table 7-2: Projected Population in Resource Study Area

City or County	Total Population by Year (Projected 2020-2040)				% Projected Change from 2010-2040
	2010	2020	2030	2040	
City of Austin	790,390	984,640	1,162,199	1,338,714	69.4%
City of Kyle	28,016	31,126	33,613	35,203	25.7%
City of Buda	7,295	9,831	14,132	19,369	165.5%
Mountain City	648	689	753	830	28.1%
Westlake Hills	3,063	3,699	3,699	3,699	20.8%
City of Dripping Springs	1,788	2,031	2,311	2,652	48.3%
Bear Creek	382	NA*	NA*	NA*	NA*
Sunset Valley	749	1,134	1,480	1,806	141.1%
City of Rollingwood	1,412	1,421	1,429	1,436	1.7%
Bee Cave City	3,925	4,740	5,473	6,165	57.1%
Travis County	1,024,266	1,273,260	1,508,642	1,732,860	69.2%
Hays County	157,107	238,862	313,792	398,384	153.6%

*Sources: Texas Water Development Board; Texas State Library and Archives Commission, 2013. *Note that the Texas Water Development Board does not provide population projections for Bear Creek, Hays, or San Leanna.*

Given the pattern of continued population growth that has occurred in and around the project area, numerous transportation facilities and housing developments are planned within the areas encompassed by the combined RSA. **Table 7-3** lists some of the planned projects in the combined RSA. This is a partial list of planned projects as of April 2014. See also **Attachment B** which includes transportation, land use, and other planning maps from various jurisdictions.

Table 7-3: Planned Projects in the Combined RSA

Project Location	Description
Transportation Projects	
IH 35 from Travis County Line to Comal County line	Corridor study
US 290 W from RM 165 to Nutty Brown Road/Travis County line	Enhance roadway; widen roadway from 4 lanes to 6 lanes between RM 12 and Nutty Brown Road
SH 45SW from Loop 1 to FM 1626	Construct new location toll road
SH 45SW from FM 1626 to IH 35	Preliminary engineering analysis/environmental studies
RM 150 from RM 12 to FM 3237	Widen roadway from 2 lanes to 4 lanes
US 290/SH 71 from MoPac to RM 1826 (the "Y" at Oak Hill)	Study underway; improve roadway section and intersection configuration
Loop 1 Managed Lanes (Phase II)	Cesar Chavez to Slaughter, construct one managed lane in each direction
RM 967 from RM 1826 to IH 35	Widen roadway from 2 lanes to 4 lanes
FM 1626 from SH 45SW to IH 35	Widen roadway from 2 lanes to 6 lanes
FM 2770/Jack C. Hays Trail from RM 967 to RM 150	Widen roadway from 2 lanes to 4 lanes
RM 1826 from SH 45 to RM 150	Widen roadway from 2 lanes to 4 lanes
RM 1826/Elder Hill Bypass from RM 150 to RM 12 at Elder Hill Road (CR 170)	Construct new roadway
Creek Road/CR 190 from FM 165 to US 290	Enhance roadway
Darden Hill Road/CR 162 from FM 150 to RM 1826	Enhance roadway
Elder Hill Road/CR 170 from RM 12 to FM 150	Enhance roadway
Garlic Creek Parkway from SH 45S to RM 967	Construct new roadway
Goforth Street/CR 228 from RM 967 to IH 35	Enhance roadway
Mount Gainor Road/CR 220 from Gatlin Creek Road to Mount Sharp Road	Enhance roadway
Nutty Brown Road/CR 163 from US 290 to RM 1826	Widen roadway from 2 lanes to 4 lanes
Old San Antonio Road from Travis County Line to Cabelas Drive	Enhance roadway
Pursley Road/Creek Road/CR 198 from FM 165 to Mt Gainor Road	Enhance roadway
Robert Light Blvd from IH 35 to FM 2770	Widen roadway from 2 lanes to 4 lanes
Robert Light Blvd from FM 2770 to FM 1626	Construct new roadway
Sawyer Ranch Road/CR 164 from US 290 to Darden Hill Road	Widen roadway from 2 lanes to 4 lanes

Table 7-3: Planned Projects in the Combined RSA cont'd

Project Location	Description
Dripping Springs North US 290 Bypass from US 290 W to US 290 East	Construct new roadway
Roger Hanks Extension from US 290 W to RM 12	Construct new roadway
Dripping Springs Southeast Bypass from RM 12 to US 290 E	Construct new roadway
Escarpment Boulevard from SH 45 to FM 150 north of FM 3237	Construct new roadway
Dripping Springs Southwest Bypass/FM 150 from US 290 W to RM 12	Construct new roadway
Development Projects	
Buda – Silverado Crossing	New apartment complex – 300 units, 16.07 acres
Buda – Whispering Hollow	New subdivision – 642 lots, 183.9 acres
Buda – Elm Grove	New subdivision – 482 lots, 202.9 acres
Buda – Garlic Creek West Phase III	New subdivision – 826 lots, 202 acres
Dripping Springs – Rim Rock Completion	Subdivision expansion – 663 residential lots
Dripping Springs – Rutherford West	New subdivision – 246 residential lots
Dripping Springs – Reunion Ranch	New subdivision – 475 to 525 residential lots
Dripping Springs – O-Bar Ranch	New subdivision – 15 lots (100 acres each) in accordance with COA and Nature Conservancy development restrictions
Dripping Spring – Bella Vista (along Bell Springs Road)	New subdivision – 86 lots
Dripping Springs – Caliterra	New subdivision – 585 lots, 600 acres
Austin – Key Ranch (along Trautwein Road)	New subdivision – 156 lots, 366 acres
Driftwood – Driftwood Subdivision (along RM 1826)	New subdivision – 91 lots
Buda – Hudson Ranch*	New subdivision – 1,274 lots, 600 acres

Sources: Hays County Transportation Plan (adopted January 22, 2013; amended March 5 and June 24, 2013)
City of Buda Transportation Master Plan Update (February 2013)
CAMPO 2035 Update (October 2012)
RSA Map with comments from Roxie McInnis, Hays County Development Services Department, January 9, 2014.
*Note that according to a recent Austin American-Statesman article (12/4/ 2013), this development has been sold to the City of Austin for Water Quality Protection Lands.

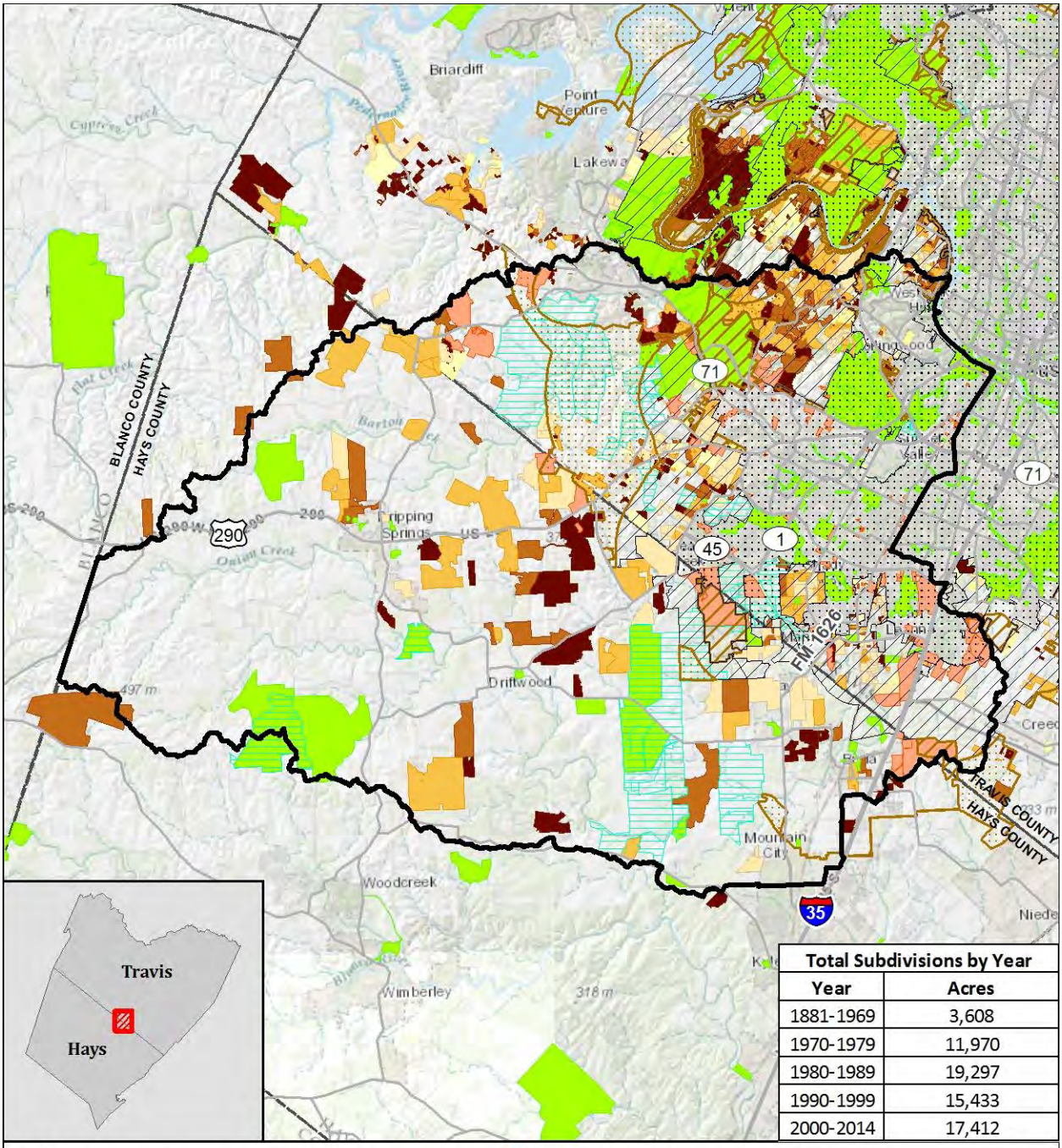
On January 10, 2014, a phone interview was conducted with Mike Weaver of Prime Strategies, who is a planning advisor to Hays County regarding transportation projects. Mr. Weaver indicated that the Hudson Ranch property in Buda was recently purchased by the City of Austin as part of Water Quality Protection Lands, so would no longer be expected to be developed. Mr. Weaver also indicated that all the projects in the Hays County transportation plan and the development plans obtained from Buda and Hays County would be expected to develop regardless of whether or not SH 45SW between MoPac and FM 1626 is constructed. The parcels that are planned for development have other options for transportation access. In addition, Mr. Weaver indicated that some land may be redeveloped for more intensive uses, but is already developed for some amount of residential land use such as Marbridge Farms. Another factor that plays a substantial role in whether or not additional land use development will take place is the availability of water. Obtaining well permits will continue to be more difficult. The County's new subdivision ordinances impose controls on development and the LCRA is providing fewer permits in the RSA according to Mr. Weaver. In the area of the RSA that is just east of IH 35 and near SH 45SE, several large developments are already underway including Sunfield and Estancia (Pers. Comm. Weaver, 2014).

In April 2014, the State was provided with planned development information near SH 45SW and the Bliss Spillar intersection. Four parcels are proposed for development southwest of SH 45SW and Bliss Spillar Road. The parcels are 156.6 acres, four acres, two acres, and 50.3 acres for a total of 212.9 acres. Proposed land uses would be retail (approximately 200,000 sq. ft.) and multi-family (525 units) (Pers. Comm. Hill Country Conservancy and CTRMA, April 2014). In addition, this developer proposes to dedicate 113 acres of parkland off of FM 1626 in association with the proposed developments.

According to the Dripping Springs City Planning Director: "there are only a few developments, primarily the remainder of the Rim Rock (663 residential lots) and Rutherford West (246 residential lots) subdivisions, Reunion Ranch (between 475 and 525 residential lots), and the O-Bar Ranch subdivision, which is only 15 lots of 100 acres each. The O-Bar is being developed under some fairly tight restrictions overall due to the COA and the Nature Conservancy having placed severe development restrictions on it" (Pers. Comm, Thompson, 2014).

COA tracks emerging development projects in its development jurisdiction. **Figure 7-1** shows shapefile information for those projects. **Attachment A** includes a table depicting each project and some of the available information about it (**Table A-1**). Note that this is a snapshot in time and is likely to change, and may not be a complete picture of developments that are underway. Approximately 8,224 acres of emerging projects are planned in the City of Austin within the groundwater RSA.

Figure 7-1: Historical & Ongoing Hays & Travis County Land Development by Decade (from 1973 in Hays County & 1881 in Travis County) & City of Austin Emerging Projects in the Combined RSA



Total Subdivisions by Year	
Year	Acres
1881-1969	3,608
1970-1979	11,970
1980-1989	19,297
1990-1999	15,433
2000-2014	17,412

Source: ESRI (2014), Hays Co (2009, 2014), Travis Co (2014), CoA (2011, 2013, 2014), TPWD (2011)

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Figure 7-1 also depicts past projects based on development year according to Hays and Travis counties' Development Services/GIS departments. A total of approximately 27,193 acres have been developed from 1970 to the present in Hays County and 40,528 acres have been developed (of which some are continuing to develop) in Travis County. **Tables A-2** (Hays County) and **A-3** (Travis County) in **Attachment A** list these subdivision developments and their acreages. Note that this is a snapshot in time and may not depict all past development projects in Hays or Travis counties within this RSA.

In addition to the information gathered through questionnaires and interviews for the RSA described above, on-line research was conducted to identify some of the numerous transportation, land use, and conservation plans that have some overlap with the RSA. **Attachment B** includes maps of planned transportation projects and future land use plans from the various political jurisdictions that fall partially within the RSA. These plans indicate that entities in the RSA are anticipating additional growth and are planning for it in terms of infrastructure, capital improvements, zoning, and future land use plans. These plans reflect the goals and visions for these communities in the future, and provide a visual reference for where various jurisdictions would apply their land development codes and subdivision development requirements, including environmental controls. In addition, maps are included that specifically represent conservation goals, such as those from the Hays County Regional Habitat Conservation Plan identifying key habitat areas for the Golden-cheeked Warbler, and the Capital Area Council of Governments (CAPCOG) Greenprint for Growth which was a multi-jurisdictional visioning process for participating central Texas counties. Maps in **Attachment B** include:

- *City of Austin Emerging Projects*
- *Imagine Austin Susceptibility to Change Map*
- *Bee Cave Future Land Use Plan and Thoroughfare Plan*
- *Buda 2030 Comprehensive Plan – Future Land Use Development Plan*
- *Buda 2030 Comprehensive Plan – Zoning Districts Map*
- *Buda Transportation Plan Map*
- *CAMPO Interactive Map*
- *Dripping Springs Comprehensive Plan Future Land Use Map*
- *Dripping Springs Transportation Plan Map*
- *Dripping Springs Zoning Map*
- *Hays County Transportation Plan Map*
- *Kyle Future Land Use Map from the Kyle Comprehensive Plan*
- *Travis County Capital Improvement Projects Map*
- *Hays County RHCP GWCA Focal Area Preserves*
- *Greenprint for Growth 2009 Composite Map (CAPCOG)*

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8.0 The Overall Effects of the Proposed Project Combined with Other Actions

8.1 Methodology

A combination of planner interviews, cartographic analysis, and technical expert research and data collection was used in order to assess the overall effects of the proposed project combined with other actions.

8.2 Golden-cheeked Warbler

Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, no impact to this species is anticipated as a result of the proposed project. There are an estimated 4,102 acres of potential Golden-cheeked Warbler habitat on developable land plus 447 acres of potential habitat on land for which developments have been proposed or are under construction within the geographic RSA, according to the Texas A&M model (2010). This constitutes 31 percent of the available potential habitat within the RSA. The rest of the potential habitat within the RSA falls on either COA WQPLs (approximately 4,427 acres) or undevelopable land (approximately 4,241 acres). Potential future developments on developable land with verified suitable Golden-cheeked Warbler habitat would have to be permitted and/or mitigated through one of the regulatory mechanisms in place such as the ESA, BCCP, and Hays County HCP. These are discussed in more detail in **Section 9.1**. The BCCP and Hays County HCP will set aside approximately 30,428 acres and up to 15,000 acres of Golden-cheeked Warbler habitat in Travis and Hays counties, respectively, over the course of their 30 year permit lifespan, ensuring the preservation of warbler habitat throughout the region. This is in addition to COA WQPLs that, while not set aside specifically to benefit Golden-cheeked Warblers, will still help to reduce habitat loss and fragmentation throughout the region of the proposed project.

According to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties* (TxDOT, SWCA, and Cambrian, 2014), “no direct or indirect impacts would occur to the Golden-cheeked Warbler as a result of construction of SH 45SW. Therefore, construction of the roadway would not contribute to the impacts this species has experienced or is expected to experience, as a result of past, present, and future actions.”

8.3 Barton Springs and Austin Blind Salamander

There would be no direct effects to the Barton Springs and Austin blind salamanders from the proposed project. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected as a result of the project. Reasonably foreseeable projects undertaken within the RSA would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs salamander or the Austin blind salamander or their habitat.

The geographic RSA for the salamanders covers approximately 261,289 acres. Within that area there are currently 23,214 acres (or 8.8 percent of the RSA) of impervious cover as compared to 237,975 acres of land that is still potentially permeable to groundwater. Of this impervious cover, 12,697 acres falls over the Edwards Aquifer Contributing Zone, 628 acres falls over the Edwards Aquifer Contributing Zone within the Transition Zone, 6,784 acres falls over the Edwards Aquifer Recharge Zone, and 23,314 acres falls over the Edwards Aquifer Transition Zone. An analysis of past trends of impervious cover is summarized in **Table 8-1.** The incremental effects from the proposed project to these species are negligible in the context of the overall cumulative effects of the reasonably foreseeable future projects assessed in this document.

According to the *Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties* (TxDOT, SWCA, and Cambrian, 2014), because of the stormwater controls and water quality BMPs included in the design of the roadway, the construction and use of SH 45SW is not expected to result in any direct or indirect adverse impacts to the Barton Springs salamander or Austin blind salamander. Therefore, construction of the roadway would not contribute to the impacts these species have experienced or are expected to experience, as a result of past, present, and future actions within the Barton Springs watershed."

8.4 Edwards Aquifer/Groundwater

Stormwater runoff and streams crossing the Recharge Zone are the main sources of recharge to the Edwards Aquifer. Consequently, the quality of these waters is directly related to the quality of water entering the aquifer. As development in the RSA continues, the potential for degradation of stormwater increases through increased impervious surface and additional point-source pollutant sources (e.g., septic systems, industrial facilities, accidental spills, and underground storage tanks). As a result, the potential for degradation of the Edwards Aquifer exists as well. As discussed earlier, groundwater sampling has confirmed the relatively high quality of water in the Edwards Aquifer. However, the detection of anthropogenic contaminants in some of the samples indicates the susceptibility of the aquifer to development and urbanization on the Recharge Zone and Contributing Zone (Mahler et al., 2006).

The proposed project would add a total of approximately 51.64 acres of impervious cover, of which 48.12 acres (93.2 percent of the increase) would be added within the Recharge Zone of the Edwards Aquifer. Research has shown a strong correlation between the imperviousness of a watershed and the health of its receiving streams. In a review of water quality literature, Schueler (1994) concluded that the research, conducted in many geographical areas, concentrating on many different variables, and employing widely different methods, has yielded a surprisingly similar conclusion – stream degradation occurs at relatively low levels of imperviousness (10 to 20 percent). Past activities have resulted in the development and changing land uses in the watersheds within the RSA. The extent of past growth is evident through an assessment of impervious cover in each watershed in the years 1970, 1990, and 2012.[1] As indicated in **Table 8-1**, the level of development in each watershed in the RSA is indicated by the percent of impervious cover shown. **Figure 8-1** presents the extent of impervious cover mapped in the years 1970, 1990, and 2012. Additional figures presenting mapped impervious cover are provided in **Attachment C**.

As the trend for growth in the Austin area continues, the trend for increased impervious cover in the watersheds in the RSA would be expected to continue. The various land use plans identified in **Section 7.0** indicate that the municipalities within the RSA anticipate future development, along with preservation of open space. As discussed earlier, the correlation between increased impervious cover and decreased surface water quality is strong. However, with current regulatory measures and future planning efforts to protect water quality, future development would be less likely to adversely affect surface and groundwater quality.

[1] The 1970 dataset included aerial imagery from Texas Natural Resources Information System (TNRIS) from 1970 and was supplemented with USGS data from 1973 and TNRIS data from 1974 for areas where 1970 aerial imagery was not available. The 1990 dataset included aerial imagery from TNRIS from 1990 and 1991. The 2012 dataset included aerial imagery from USDA National Agriculture Imagery Program. The methodology used to conduct this analysis of impervious cover over time can be found in the ***Methodology for Impervious Cover Change Detection over the Edwards Aquifer*** (2014), included in this report as Attachment D.

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Table 8-1: Impervious Cover within Groundwater Resource Study Area

Watershed	Contributing Zone			Recharge Zone			Transition Zone			Contributing Zone within Transition Zone			Total		
	Total Acreage	Impervious Acreage	Impervious Acreage/ Total Acreage (%)	Total Acreage	Impervious Acreage	Impervious Acreage/ Total Acreage (%)	Total Acreage	Impervious Acreage	Impervious Acreage/ Total Acreage (%)	Total Acreage	Impervious Acreage	Impervious Acreage/ Total Acreage (%)	Total Acreage	Impervious Acreage	Impervious Acreage/ Total Acreage (%)
Barton Creek															
1970	75,164	1,283	1.7%	8,132	560	6.9%	185	50	27.1%	0	0	n/a	83,481	1,893	2.3%
1990	75,164	2,974	4.0%	8,132	1,442	17.7%	185	56	30.3%	0	0	n/a	83,481	4,472	5.4%
2012	75,164	4,950	6.6%	8,132	1,858	22.8%	185	61	33.0%	0	0	n/a	83,481	6,869	8.2%
Williamson Creek															
1970	4,982	339	6.8%	6,173	155	2.5%	2,710	463	17.1%	161	28	17.4%	14,026	985	7.0%
1990	4,982	584	11.7%	6,173	990	16.0%	2,710	807	29.8%	161	35	21.7%	14,026	2,416	17.2%
2012	4,982	1,133	22.7%	6,173	1,901	30.8%	2,710	920	34.0%	161	45	28.0%	14,026	3,999	28.5%
Slaughter Creek															
1970	7,066	235	3.3%	7,232	41	0.6%	1,876	125	6.7%	426	5	1.2%	16,600	406	2.4%
1990	7,066	458	6.5%	7,232	411	5.7%	1,876	326	17.4%	426	76	17.8%	16,600	1,271	7.7%
2012	7,066	767	10.9%	7,232	1,371	19.0%	1,876	687	36.6%	426	167	39.2%	16,600	2,992	18.0%
Bear Creek															
1970	13,027	80	0.6%	15,955	79	0.5%	2,662	71	2.7%	460	1	0.2%	32,104	231	0.7%
1990	13,027	342	2.6%	15,955	395	2.5%	2,662	257	9.7%	460	4	0.9%	32,104	998	3.1%
2012	13,027	1,303	10.0%	15,955	570	3.6%	2,662	368	13.8%	460	176	38.3%	32,104	2,417	7.5%
Onion Creek															
1970	83,421	893	1.1%	19,032	88	0.5%	3,711	109	2.9%	1,890	43	2.3%	108,054	1,133	1.0%
1990	83,421	1,548	1.9%	19,032	203	1.1%	3,711	229	6.2%	1,890	176	9.3%	108,054	2,156	2.0%
2012	83,421	2,705	3.2%	19,032	561	2.9%	3,711	479	12.9%	1,890	190	10.1%	108,054	3,935	3.6%
Town Lake-Colorado River															
1970	0	0	n/a	33	10	29.9%	845	270	31.9%	0	0	n/a	879	280	31.9%
1990	0	0	n/a	33	13	38.9%	845	330	39.4%	0	0	n/a	879	343	39.0%
2012	0	0	n/a	33	14	41.9%	845	333	39.4%	0	0	n/a	879	347	39.5%
Bunton Branch-Plum Creek															
1970	0	0	n/a	0	0	n/a	2,869	91	3.2%	25	4	16.0%	2,894	95	3.3%
1990	0	0	n/a	0	0	n/a	2,869	165	5.8%	25	4	16.0%	2,894	169	5.8%
2012	0	0	n/a	0	0	n/a	2,869	219	7.6%	25	4	16.0%	2,894	223	7.7%
Total															
1970	183,660	2,830	1.5%	56,558	933	1.6%	14,858	1,179	7.9%	2,962	81	2.7%	258,038	5,023	1.9%
1990	183,660	5,960	3.2%	56,558	3,454	6.1%	14,858	2,170	14.6%	2,962	295	10.0%	258,038	11,825	4.6%
2012	183,660	10,858	5.9%	56,558	6,275	11.1%	14,858	3,067	20.6%	2,962	582	19.6%	258,038	20,782	8.1%

Source: Blanton, 2014.

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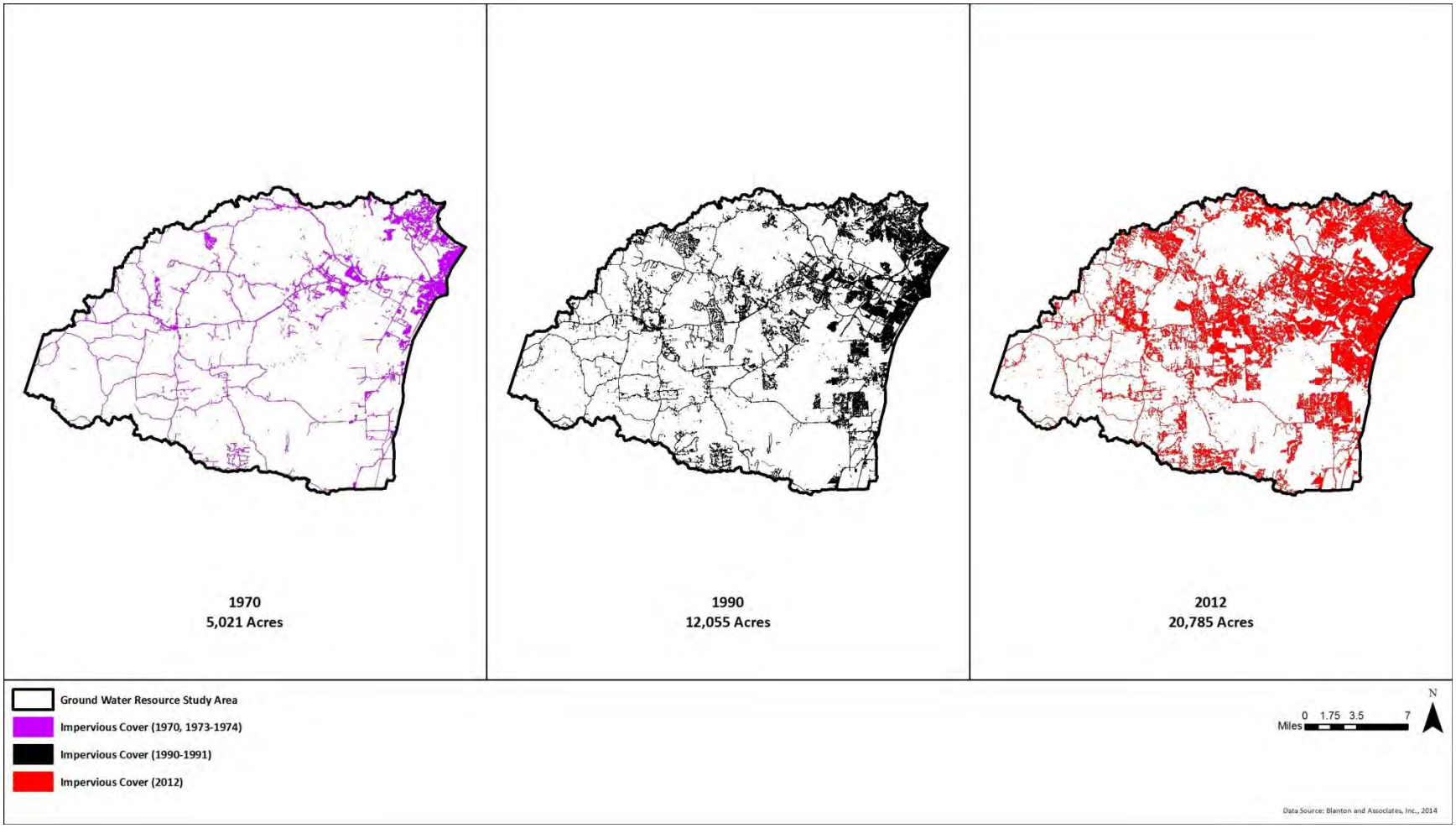
Figure 8-1: Impervious Cover within Groundwater Resource Study Area in 1970, 1990, and 2012



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8.5 Surface Water

Some localized surface water and groundwater impacts would be anticipated to occur as a result of the project's construction. Increased impervious cover from the construction of the proposed roadway, in conjunction with possible induced development in the RSA, could result in some reduction in water quality over time in area watercourses. Impervious cover channels pollutants more directly into creeks without the water purification benefit provided by infiltration and overland flow across vegetated areas. Impervious cover would also have the potential to reduce recharge entering the Edwards Aquifer, which could affect sensitive species in the aquifer.

Approximately 86 linear miles of creeks flow through the Mustang Branch – Onion Creek watershed. Approximately 116 linear miles of creeks lie within the Bear Creek watershed and approximately 103 linear miles of creeks lie within the Slaughter Creek - Onion Creek watershed. Anticipated development within the RSA could adversely affect water quality throughout the RSA, but would be in part mitigated by several water quality protection regulations to be discussed in **Section 9.0**.

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9.0 Minimization and Mitigation of Cumulative Effects

9.1 Threatened and Endangered Species

9.1.1 Golden-cheeked Warbler

The Golden-cheeked Warbler is one of the species addressed in the BCCP, an incidental take permit for Golden-cheeked Warblers, Black-capped Vireos, and six federally endangered karst invertebrate species under Section 10(a)(1)(B) of the ESA. The take covered by the permit would include direct and indirect takes associated with grading, clearing, or other earth-moving activities necessary for residential, commercial, or industrial development and infrastructure projects as well as indirect impacts, such as noise, predation, and harassment from the occupancy and use of these structures. As a part of the BCCP, approximately 30,428 acres of Golden-cheeked Warbler and Black-capped Vireo habitat will be protected within a preserve system called the Balcones Canyonlands Preserve (BCP). The habitat protected by the BCP is considered to be some of the highest quality and least fragmented habitat of any county in the Golden-cheeked Warbler's range. Areas covered by the BCCP in the event of incidental take include all of Travis County with the following exceptions: the BCP, portions of the Balcones Canyonlands National Wildlife Refuge (BCNWR) that fall within Travis County, and areas within city limits and planning jurisdictions of municipalities that are not participating in the BCCP. The BCCP will last for 30 years (COA, & Travis County, 1996).

Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW. Therefore, no impact to this species is anticipated as a result of the proposed project. TxDOT is investigating the possibility of participating in the BCCP for conservation benefit, although no impact to Golden-cheeked Warbler is anticipated as a result of the proposed project.

Other actions and developments within the RSA would be responsible for mitigation should suitable Golden-cheeked Warbler habitat be affected. The BCCP provides mitigation for new public schools, roads, and infrastructure project of the participating agencies (Travis County, City of Austin, and the LCRA). Landowners and developers may elect to participate in the BCCP to mitigate for development of GCW habitat rather than mitigating directly though the USFWS (Travis County, 2014). There are also other landowner participation options, such as "Land in Lieu of Fee" and conservation easements. Similarly, impacts to Golden-cheeked Warbler habitat in Hays County can be mitigated for through similar provisions under the Hays County HCP. Ultimately it will be up to the agency, landowner, or developer to mitigate for any losses to Golden-cheeked Warbler habitat that result from their action.

9.1.2 Austin Blind Salamander and Barton Springs Salamander

There are no direct effects to the Austin blind salamander and the Barton Springs salamander as a result of the proposed project due to the implementation of robust BMPs during construction and operation of SH 45SW, including erosion controls, sediment controls, and post-construction TSS controls, that would avoid or reduce impacts to water quality. Examples of BMPs that would be used during project construction include mulch logs, rock filter dams, and silt fences, which are described in detail in the ***Water Quality and Aquatic Resource Protection Technical Report***. Potential hazardous material removal would be addressed through the use of several structural and non-structural BMPs, including the placement of hazardous materials traps at key locations. During operation and maintenance of the SH 45SW facility, BMPs would be used in a series with each in the line removing additional TSS and other pollutants, including the use of PFC pavement and vegetated swales/filter strips. Pollutant removal rates through these "stacked" BMPs can exceed 90 percent, as discussed in the ***Water Quality and Aquatic Resource Protection Technical Report***. Where direct impacts are not anticipated, and where regulatory requirements minimize the potential for indirect effects, cumulative effects are not likely to occur.

Projects moving forward as a partial result of induced growth from the proposed project, and present or reasonably foreseeable projects (as discussed in **Section 7.0**), would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs salamander or the Austin blind salamander or their habitat significantly enough to be qualified as a take of the species. The ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (ESA, 1973). The Barton Springs salamander and the Austin blind salamander are not species listed for protection under the BCCP or the Hays County HCP. However, land set aside for the BCCP protects groundwater quality in the Barton Springs segment of the Edwards Aquifer, which indirectly benefits the salamanders. Furthermore, the COA has set aside more than 26,000 acres of WQPLs specifically to protect the water quality within the Edwards Aquifer, which will also indirectly benefit and protect the Austin blind salamander and the Barton Springs salamander. COA is continuing to purchase WQPL, as noted with their recent plans to purchase an additional 607 acres of land in northern Hays County to add to their WQPL total. These existing protections will help to mitigate for future effects to the listed salamander species. See the discussion in **Section 9.2** for further information for protections in place for groundwater quality.

9.2 Edwards Aquifer/Groundwater Resources

Mitigation for potential water quality impacts occurs in the form of regulations and ordinances. Two agencies – the TCEQ and the BSEACD – share responsibility for protecting the Barton Springs segment of the Edwards Aquifer. The individual and combined effect of these regulatory programs is to protect water quality and/or mitigate the adverse effects to water quality from development activities.

TCEQ regulations to protect the Edwards Aquifer are contained in the *Edwards Aquifer Rules* (30 TAC 213). These rules require developers who are planning to construct on the Recharge Zone or portions of the Contributing Zone of the Edwards Aquifer to prepare and submit an aquifer protection plan to the TCEQ for review and approval. The rules require the use of permanent stormwater BMPs that are able to remove 80 percent of the incremental increase of TSS in runoff from the site. The rules do not require the use of permanent BMPs for single-family residential development that has 20 percent or less impervious cover. Additionally, the TCEQ has issued two optional guidance documents, *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer* and *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates*. These documents provide optional enhanced water quality measures and BMPs for protecting the Edwards Aquifer that may be implemented in areas subject to the *Edwards Aquifer Rules*. The optional enhanced measures are consistent with the TCEQ's goal of non-degradation of groundwater quality and may be used to further protect the Edwards Aquifer, including public health and welfare, terrestrial and aquatic life, and the environment (TCEQ 2007).

The TCEQ's Total Maximum Daily Load (TMDL) Program works to improve water quality in impaired or threatened water bodies in Texas. A TMDL defines an environmental target by determining the extent to which a certain pollutant must be reduced. TMDLs are developed for surface waters that are quality-limited due to a pollutant or adverse condition. Based on the environmental target in the TMDL, the State develops an implementation plan to mitigate sources of pollution within the watershed and restore impaired uses. The Texas Water Quality Inventory and 303(d) List is an overview of the status of surface waters of the State, including concerns for public health, fitness for aquatic species and other wildlife, and specific pollutants and their possible sources. The 303(d) List, a subset of the Inventory, identifies waters that do not attain one or more standards for their use.

Water quality at wells and in the Edwards Aquifer is protected by the Safe Drinking Water Act of 1974 and the 1996 Amendments to the Act (Public Law 104-182), laws that protect drinking water and provide source water protection. The 1996 Amendments provided new and stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection. These rules required states to delineate source water areas of public water systems and assess the susceptibility of such source waters to contamination. The source water assessment results would then be used to implement source water protection programs. TCEQ's Source Water Protection Program (SWPP) was created by the 1996 Amendments to the Safe Drinking Water Act and sets into motion a voluntary process by which local governments and suppliers of drinking water are encouraged to take proactive steps to protect local drinking water supplies before costly treatment enhancements are required. These supplies are defined primarily as water systems serving at least 15 connections or at least 25 persons at least 60 days per year.

The BSEACD, a groundwater conservation district with authority in the RSA, regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2010). The drought management program allows the BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevation at an observation well.

The COA has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. The Save Our Springs Ordinance, which was adopted in 1992, requires non-degradation and includes impervious cover limits of 15 percent for all development in the Recharge Zone, 20 percent for development in the Barton Creek portion of the Contributing Zone, and 25 percent for development in the remaining portions of the Contributing Zone in Williamson, Slaughter, Bear, Little Bear, and Onion Creeks (COA, 2013f). The most recent COA ordinance was passed in 2013; this ordinance aimed to improve creek and floodplain protection, prevent unsustainable public expense on drainage systems, simplify development regulations where possible, and minimize the ordinance's impact on the ability to develop land (COA, 2013c). Another water quality protection mechanism regulated by the COA is the city's WQPL program; this program currently manages 26,527 acres within the Contributing and Recharge Zones of the Barton Springs segment of the Edwards Aquifer. The preservation of these sensitive tracts of land will not only help preserve the quality and quantity of water entering the aquifer, it will preserve wildlife habitat and native vegetation.

Sections 404 and 401 of the Clean Water Act include provisions and responsibilities for water quality protection measures and protection of wetlands. For Section 404 permits issued by the USACE, TCEQ is authorized to certify that these permits meet the State's water quality standards. TCEQ carries out this responsibility under the Section 404 permitting program and can require the installation of temporary and permanent stormwater BMPs as part of the conditions of a Section 404 permit.

9.3 Surface Water

Existing regulations and programs, and BMP recommendations put forth by various agencies are set in place to promote and maintain water quality in the area. These will aid in acting as control measures for both surface waters and groundwater for future development projects within the RSA.

9.3.1 Surface Water Regulations

The EPA's National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Clean Water Act (CWA), controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered

by the TCEQ, as part of the Texas Pollutant Discharge Elimination System (TPDES). A NPDES permit may be required if wastewater is discharged into the stormwater system. The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. The term "waters of the United States" has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as listed below:

- The territorial seas with respect to the discharge of fill material;
- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands;
- Tributaries to navigable waters of the United States, including adjacent wetlands; and
- Interstate waters and their tributaries, including adjacent wetlands.

Section 404 of the Clean Water Act gives the USACE authority to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Impacts to waters of the U.S. could require USACE authorization. If a linear transportation project places less than 0.5 acre of fill into waters of the U.S., it would typically be authorized under Nationwide Permit (NWP) 14 for Linear Transportation projects; impacts of 0.5 acre or more require an Individual Permit. Impacts authorized under NWP 14 which equal or exceed 0.1 acre require Pre-Construction Notification (PCN) to the USACE. Impacts to wetlands (of any amount) would also require PCN. Similar requirements are listed for various development projects in the Summary of the 2012 Nationwide Permits. Any future development project in the RSA would be required to comply with USACE regulations.

Floodplains are lowland areas adjacent to water bodies, which are inundated during flood events. Construction within a floodplain reduces its capacity for floodwater storage and infiltration, as well as its value as habitat. Under Executive Order 11988 Floodplain Management, the FEMA requires municipalities that participate in the National Flood Insurance Program to adopt floodplain ordinances that prohibit development in existing 100-year floodplain. Coordination with the local floodplain administrator may be required for any future developments.

In order to meet minimum control measures (MCM) set by the TCEQ, any project with construction on a TxDOT system within a municipal separate storm sewer system (MS4) area needs to have a Notice of Intent (NOI) submitted to the proper TxDOT district. Part of the Phase I MS4 area that serves the city of Austin is within the RSA. Travis County is also an MS4. TxDOT utilizes various Best Management Practices (BMPs) and programs to address these measures, as listed in **Table 9-1.**

Table 9-1: Methods to Address Minimum Control Measures Within a MS4 Area

MCM	BMP Example	Implementation Plan
MS4 Maintenance Activities	Structural Control Maintenance	Inspect structural controls at least once per year. Schedule follow-up actions as necessary.
Post-construction Storm Water Control Measures	Permanent Structure	Inspect permanent structure control.
Illicit Discharge Detection and Elimination	Update Storm Sewer Outfall Map	Map and screen all outfalls.
Pollution Prevention	Waste Handling	Ensure proper disposal of litter via collection and/or street sweeping. Ensure proper disposal of spoils via drainage ditches and structural controls.
Construction Site and Storm Water Runoff	Compliance with the Construction General Permit	Require compliance with the Construction General Permit.
Public Education/Outreach	Don't Mess with Texas program	Continue programs, which may include clean-ups, Adopt-a-Highway, etc.
Monitoring and Screening	Dry Weather/Wet Weather Monitoring	Utilization of a monitoring program.

Source: TxDOT Construction Storm Water Management Program (http://www.txdot.gov/inside-txdot/division/environmental/programs/swmp.html)

9.3.2 BMP Recommendations

Impervious cover in the project area would be minimized due to use of PFC pavement for the roadway. Removal of TSS exceeds the 80 percent reduction required by TCEQ, and also reduces total metals and total phosphorus levels (Barrett 2008). Numerous other structural and non-structural BMPs are proposed for the current project and detailed in the ***Water Quality and Aquatic Resource Protection Technical Report***.

According to the analysis summarized in **Table 8-1**, based on 2012 aerial photography, approximately 20,782 acres of impervious cover, or 8.1 percent, exist in the groundwater RSA. Development by others may be proposed within the RSA.

TCEQ has several accepted permanent BMPs that reduce the effects that vegetation removal can have on the environment:

- Vegetative Filter Strips – Vegetated sections of land with low slopes designed to accept runoff as overland sheet flow.
- Grassy Swales – Vegetated channels that convey stormwater and remove pollutants by filtration through grass and infiltration through soil. It has been determined that grassy swales are an effective, low maintenance alternative to structural controls (Barrett, et al. 1996).

The COA recognizes the importance of vegetation buffers, especially along streams. They have implemented 25-foot "Grow Zones" where mowing is prohibited along creeks to restore water quality, decrease erosion, and enhance wildlife habitat. Currently there are no areas in the RSA that are under the Grow Zone policy, but as the program continues to develop the City may implement new zones within the RSA. Approximately 4,930 acres (0.5 percent) of CWQZs and 5,654 acres (0.6 percent) of WQTZs are in the study area. Approximately 14,163 acres (16 percent) of WQPLs are within the RSA.

TxDOT has created Vegetation Management Guidelines (2013) in order to enhance environmental protections and mitigate erosion. Two levels of management are recommended for urban vs. rural roadways, but additional measures are recommended for special circumstances, such as special habitat or threatened and endangered species. All recommendations from those guidelines would be followed along current and future TxDOT roadways in the RSA, including mowing restrictions, adding trees and shrubs along ROW, and encouraging seed production.

TCEQ lists additional BMPs for construction and post-construction phases that future development projects would be required to consider, as discussed in the ***Water Quality and Aquatic Resource Protection Technical Report***. With implementation of the various BMPs, and requirements set by numerous authorities that govern within the RSA, it is likely that the SH 45SW project would minimally contribute to cumulative effects to water quality/quantity.

9.4 Various Municipal Codes including Land Development Regulations

As discussed in the Indirect Technical Report, proposed developments would be subject to various municipal land development codes that require environmental investigations or impose development restrictions such as impervious cover limits, in addition to county, state, and federal regulations that may apply.

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10.0 Conclusions

This analysis identified Golden-cheeked Warblers, Austin blind salamanders, and Barton Springs salamanders, and their habitats in addition to the Edwards Aquifer and surface waters; discussed the health of these resources and relevant trends; and identified specific RSA boundaries and appropriate temporal boundaries for the analysis. Direct and potential indirect impacts were summarized for each sensitive resource. Past, present, and reasonably foreseeable future actions were identified through research, interviews, and cartographic analysis. The proposed construction of SH 45SW was considered in conjunction with these other actions to consider aggregate impacts. Logical analysis was been utilized to appropriately describe sensitive resources that are within the RSAs for SH 45SW, and the extensive controls that have evolved over time to help protect these resources were also discussed.

Minimization of impacts to sensitive resources would be achieved through specific design measures and BMPs implemented for the proposed project, and similar requirements would be applicable to developers throughout a large percentage of the RSAs, especially where construction is proposed over the Recharge and Contributing Zones of the Edwards Aquifer. Mitigation measures are required for impacts to endangered species habitat, and there are Habitat Conservation Plans in place in Hays County and Travis County, in addition to the City of Austin, that provide a framework in which developers can comply with the Endangered Species Act. The larger municipalities that exist within the RSA all have land development code requirements and plans for their future land use and transportation networks, along with open space and park planning that generally reflect a common commitment to sustainable development. The conservation entities charged with protecting endangered species and sensitive resources have plans in place to continue to protect sensitive habitats. A large portion of land within the RSAs studied would be protected in perpetuity through conservation easements or WQPLs, specifically acquired for that purpose.

Based on this analysis, given the limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction, and the incremental contribution the proposed roadway would make toward induced development in the AOI, in the context of the continuing trends of land use development and conservation initiatives underway within the RSAs, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts.

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Attachment A
Past, Present, and Reasonably Foreseeable Future Projects

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Attachment A-1

Emerging Projects – City of Austin

A-1: Emerging Projects - City of Austin	
Name	**Description**
Avana	1,020 acres with nearly 800 homes, a 250-room resort hotel with 140 condominiums, 24 single family villas and an 18 hole golf course.
So La City Homes	62 urban townhomes on a 3 acre site.
Vistas of Austin, The	The 158-acre site will have 669 single family homes
Goodnight Ranch	The 705-acre site will have 1,000 apartment units; 4,000 single family homes; and a 250,000 sq.ft community center.
West 71 Office Park PUD	This 8.6 acre site will have 40,200 sq.ft in office condominiums space
Brodie 31 PUD	This 32-acre site will have 127,865 square feet of retail uses.
Cascades at Onion Creek, formerly Fox Hill Subdivision	The 215 acre site will include 467 single family residential units; 350 multi-family units; and 63 acres of open space.
Bungalows, The	14 residential units on 1.5 acres.
Zachary Scott II (Smart Housing)	This 270 acre site will have 651 single family homes.
Blackstone Vineyard	This 209-acre site will have 153 residential units.
Coldwater	The former mobile home park will have 225 apartments in a five-story building, along with restaurant space on the ground floor.
Parkway Village	This 23 acre lot will have retail uses.
Tarlton 360 Townhomes	A 75,819 sq.ft office building; a 8,300 sq.ft shopping center; a 3,500 sq.ft restaurant as well as 229 residential units.
Estancia Hill Country	A mixed use development on 559 acres.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
Sunfield	A mixed-use development with 5,311 single family homes and 1,660 multifamily homes on 1,087 acres.
Las Casa Verdes	This 2.19 acre project with 20 single family homes.
Barton Creek Office Park	This project will add 300,000 square feet of office space in two buildings on 13.6 acres.
South Park Meadows Retail Center	425 acres that will include 1.6 million sq.ft of retail space, 650 multifamily units, 330 single family units, 110 townhomes, office and medical uses.
Amarra	This project includes 132 single family homes on 365 acres.
Hollow at Slaughter Creek, The	The 40-acre site will have 216 residential units.
Encino Trace	A six story parking garage and 332,000 sq.ft. of office space in two buildings will be constructed on the 54-acre site.
Balfour Tract (6D Ranch)	A residential and retail development on 63 acres.
Circle C Golf Estates Phase II	79 single family homes will be built on this 44.7-acre tract.
Sweetwater Glen	The 53-acre site will have 253 single family condominiums.
Aviara	216 single family condominiums will be built on this 39.5 acre site on completion
Shady Hollow Gardens	This 35.5-acre multifamily subdivision will have 144 townhomes.
Brodie Springs II Ph 2	
Dakota Springs (aka Marbridge Estates)	This 112.5 acre subdivision will have 301 single family homes, with 33.5 acres dedicated to open space.
South Lamar Plaza	9 acres with 448 residential units; 18,000 sq.ft of retail and 47,000 sq.
Clawson Multi Family	40 units in 7 buildings with associated parking.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
Travis County Emergency Services District #5 Subdivision	
Double Creek Village	27.65 acres of the 44.8 acre site will have multi-family apartments while 17.22 acres will have retail uses.
Ranch House Apartments	272 multifamily units will be built on the 15.236 acre tract.
South Bridge Village II	The 5.7-acre site will have 39 single family townhomes.
Westgate Grove	This 9.39 acre development will have 61 single family detached condominium units.
Slaughter 100 tract 14A	This 36 acre site will have office uses.
Greyrock Ridge Commons (formerly Wildflower Commons)	The 177 acre site will include 387 single family homes on 103 acres and 55 acres of open space.
Ridgeview	The 93-acre site will include 197 single family homes and 36.6 acres of greenbelt/open space area.
Esquel Phase 1, Section 4	The 45 acre development will have 78 single family residences.
Reserve at Lynnbrook	The 11.5 acre development will have 34 single family residential units.
Seton Southwest Expansion	A 7,190 sqft expansion to the existing medical facilities will be built on the 58 acre parcel.
Oakhill Senior Living	The 6.72-acre site will have 142 senior living units.
Sweetwater Ranch	Around 1,800 homes will be built on the 1,400 acre site. The scenic ridges and canyons near the lake will be preserved as a greenbelt.
Villages of Manchaca	The 5.48-acre parcel will have 38 single family townhomes.
Valley View Park	The 1.19 acre lot will have 12 duplex units.
Meadows at Double Creek	The 30.6 acre lot will include 126 single family residences as well as retail on 3.2 acres.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
2717 South Lamar	This mixed use project will have 30 townhomes on 3.95 acres and 325 apartments with 7,250 sq.ft of retail on 6.4 acres.
704 at the Spoke (South Lamar Boulevard Mixed Use)	The 7.036-acre parcel will have 360 apartments; 16,000 sqft of specialty retail ; 12,000 sqft of restaurant space and 3,500 sqft for a coffee shop.
Escondera Section 4	the 8.76 acre parcel will have 35 residential condominiums.
Lightsey	The 4.7-acre tract will have 40 residential units.
Austin Seventy-One	The 30.9 - acre lot will have 13 single family homes and 15.9 acres will be used for commercial uses.
Double Creek Village	The 14.34 acre lot will have multifamily apartments.
Rocky Creek Ranch MUD	The 468-acre planned residential community is expected to have 400 homes and 325 acres of open space.
Landmark Southpark	The 24.12-acre site will have a total 570 apartment units.
Harper Park Hotel Tract	A 118-room hotel will be constructed at this 5.19 acre site.
Legends Way	This 108.25 acre subdivision will have 289 single family homes.
New Theatre @ Zach Scott	This 27.21-acre site will have a single-rake 418 seat theater.
Zilker Park Lofts	The 1.87-acre site will have 213 multifamily residential units.
Barstow Court	This 6.38-acre parcel will have 22 single family residential units on 4.16 acres.
Blarwood Forest	This 2-acre lot will have 14 single family homes.
La Vid Urban Homes	The 4.34-acre site will have 37 duplex condominium residential units.
6500 Manchaca	The 6.349-acre site will have 134 residential townhouses, 9,000 sqft of specialty retail, 4,000 sqft of office space and 5,000 sqft of restaurant space.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
Southpark Self Storage	This 2.1-acre parcel will have a 29,127 sqft of self-storage space built on it.
Lantana	This 16-acre site will have 73,107 sqft of medical office space.
Eskew Place	The 2.26-acre project will have 69 residential units as well as some commercial space.
Preserve at Thomas Springs Road, The	This 38.465-acre site will have 32 single family residential units.
Hills of Shady Hollow, The	The 77-acre site will have 208 single family residences, 35 acres of greenbelt and 5 acres of retail uses.
Avana Phase 2	This 149.12-acre tract will have 229 single family residential units.
Lost Creek	The 1.44-acre site will have 15 detached townhome units.
South Bridge Villas	This 7.4-acre site will have 36 multifamily apartments.
Covered Bridge PUD	The 38-acre site will have 250 apartments in addition to retail, offices, restaurant space, an assisted living center, and 2 single family homes.
Lelah's Crossing	The 42-acre site will have 224 residential units.
Fox Hill Apartments	This 22-acre site will have 288 multifamily apartments.
Cypress Creek at Ledge Stone	This site will have 234 single family homes and 244 multifamily apartments.
Trinity Place Apartments	This 9.5-acre site will have 152 apartments, with 32-one bedroom apartments, 104-two bedroom apartments and 16-three bedroom apartments.
Barton Trails	The 6.3-acre site will have 157 multifamily units.
Ravenscroft Commercial	The 4-acre site will have 11,790 sqft medical office, a 4,000 sqft convenience retail, a 5,000 sqft restaurant, and 7,723 sqft of general retail.
Travis County MUD 4 South Wastewater Treatment Plant	A wastewater treatment plant will be built on this 34-acre site.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
Sunflower	The 3.14-acre site will have 26 single family residential units.
Harlan Rezoning	This 0.396-acre site will have mixed use.
Grove, The	
Regents West Campus	The 18.27-acre site will have athletic fields and a sports building.
Harper Park Residential	The 17-acre site will have 250 multifamily residential units.
River Ridge Estates Ph 2 & 3	The 43.72-acre site will have 178 single family homes.
Overlook Estates	The 41-acre site will have 39 single family homes and a 6-acre greenbelt.
Skyview Studios	109 multifamily apartments with a 14,000 sqft Goodwill, a Goodwill Job Center, as well as parking.
Creeks Edge PP	The 58-acre site will have 31 single family residential units.
Spanish Oaks Sec 7 PP	The 59-acre site will have 41 residential units.
Skywest Ranch	The 98-acre site will have 79 single family residential units.
Hamilton I PP	The 443-acre site will have 225 residential lots on 325 acres.
Bella Fortuna PP	The 158-acre site will have 450 single family residential units on 93.86 acres, an acre of commercial retail uses and 36 acres of open space.
Circle C Ranch Tract 8A	This 18-acre site will have 36 single family homes on 6.5 acres.
Cedar Bluff Research Park Section 1	The 39.93-acre site will have 39 multifamily units.
Lightsey 2	The four acre site will have 34 duplex residential units.
Landmark Conservancy	The 22-acre site will have 240 multifamily units.
Stoneridge	The 2.53-acre site will have office buildings.

A-1: Emerging Projects - City of Austin cont'd	
Name	**Description**
J&J Worldwide Services	The 7.33-acre site will have 63,859 square feet of office space.
2807 Del Curto	The 2.80-acre site will have 15 single family residential units.
Manchaca Road Business Park Phase B	The 3.96-acre site will have 48,900 square feet of warehouse and office space.
Aria Memory Care	The 5.8-acre site will have a congregate living building.
Veritas Academy	The 91-acre site will have a 57,500 square feet private school.
Clawson Patio Homes	The 1.06-acre site will have single family residential units.
Clawson Patio Homes II	The 0.83-acre site will have multifamily residential units.
Lantana Tract 32	The 46.7-acre site will have 500 multifamily residential units.
2505 and 2507 Bluebonnet	The 1.05-acre site will have multifamily residential units.
Chisolm Trail Single Family Condominiums	The 35-acre site will have around 246 detached single family condominium houses.
Parkside Community School	The 12.2-acre site will have a private elementary school.
Lynnbrook Condos	The 3.87-acre site will have single family townhomes.
Westgate and Davis Lane	The 6.11-acre site will have residential condominiums.
West Oak	The 6.73-acre site will have 38 single family condominiums.
Circle C Child Development Center	The 6-acre site will have a 22,220 sqft daycare center.

Source: City of Austin GIS Department, 2013

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Attachment A-2

Subdivision Developments in Hays County

A-2: Subdivision Developments in Hays County							
Name	**Lots**	**Acres**	**Year Platted**	**Name**	**Lots**	**Acres**	**Year Platted**
North Forty	121	41	1973	Bell Springs Ranches	43	635	1991
Douglas Estates	51	435	1973	Triple Creek Ranch	56	135	1994
Chaparral Park	200	240	1973	Madrone Ranch	47	302	1994
Big Country	140	258	1974	Polo Club	93	152	1995
Oxbow Trails	78	174	1975	Ruby Ranch	177	1097	1995
Leisurewoods	300	352	1977	Vista Grande	49	230	1997
Hays County Oaks	360	871	1977	Creek of Driftwood	75	74	1997
Bear Creek Oaks	120	687	1977	Woodland Estates	58	127	1997
Heritage Oaks	233	556	1978	Onion Creek Ranch	76	423	1997
Cimmaron Park	328	194	1978	Bradfield Village	214	80	1998
Southwest Territory	105	124	1978	Creekside Park	170	83	1998
Oak Springs	47	155	1978	Ashford Park	115	37	1998
Mountain City Oaks	320	207	1978	Hidden Springs Ranch	50	174	1999
Bear Creek Estates Sec 2	52	221	1979	Sawyer Ranch	48	280	1999
Allegre Monantial	43	61	1979	La Ventana	583	585	1999
Sequoyah	200	80	1980	Copper Hills	49	61	1999
Goldenwood	105	389	1981	Springlake	180	686	1999
Rainbow Ranch	104	1722	1981	Elliot Ranch	112	546	1999
Bonita Vista	144	65	1982	Sierra West	99	382	2000
Sunset Canyon	1175	1742	1983	Arroyo Ranch	129	142	2001
Barton Creek Ranch	96	283	1983	The Preserve	49	244	2001
Goldenwood West	98	218	1983	Belterra	500	991	2002
Saddletree Ranch	117	412	1984	Cullen Country	210	62	2003
Oak Run West	46	135	1984	Rim Rock	545	755	2003

A-2: Subdivision Developments in Hays County cont'd							
Name	**Lots**	**Acres**	**Year Platted**	**Name**	**Lots**	**Acres**	**Year Platted**
Heritage Country	50	281	1984	Stoneridge	293	36	2004
Westcave Estates	320	270	1984	Meadow Park	100	44	2004
Hills of Texas Estates	120	153	1984	Whispering Hollow	128	222	2004
Coves of Cimmaron	270	177	1984	Highpointe	217	739	2005
Hills of Texas	120	39	1984	Howard Ranch	57	139	2005
Crosshouse	75	189	1985	Meadows at Buda	110	95	2005
Oak Forest	135	373	1985	Preserve at La Ventana	49	126	2005
Meadow Oaks	120	85	1985	Reunion Ranch	128	149	2005
Friendship Ranch	98	471	1986	Rutherford West	58	111	2005
Harmon Hills	63	382	1986	Bush Ranch	105	122	2006
River Oaks Ranch	88	1031	1987	Garlic Creek West	167	168	2007
Driftwood Falls Estates	63	66	1987	Chama Trace	46	98	2007
Kirby Springs	98	856	1989	Elm Grove	108	63	2007
Meadow Creek Ranch	75	243	1990	Sunfield	159	101	2008
Hill Country Ranches	226	2457	1990	**Total Acres:**		**27,193**	

Source: Hays County Development Services Department, 2014.

Attachment A-3

Subdivision Developments in Travis County

A-3: Subdivision Developments in Travis County					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Manchaca	11.31	1881	Steiner Ranch Ph 1 Sec 1	60.07	1988
Matthews Addition	17.89	1904	Paleface Park Ph 1 Sec C	70.46	1989
Town of Creedmoore	32.99	1907	Paleface Park Ph 1 Sec B	212.14	1989
Bruton Springs Subd	161.20	1912	Kinser-Wheeler	36.90	1989
Knollwood	8.30	1953	Estates Above Lost Creek Resub Lot 44 Blk B	1.87	1989
Panther Hollow No 1	13.59	1954	Seven Oaks Sec 3 Ph 1 Amend	27.05	1989
Baldwin's Point Resub	24.08	1954	Ben Crenshaw Golf Course	223.79	1989
Lakeland Park	22.69	1955	Estates Above Lost Creek Sec 2	2.01	1989
Manchaca Gardens	30.40	1955	Hills of Lost Creek Sec 4 PhA Am Lots 5-6 Ph A & Lot 26 Ph B	1.51	1989
Izaak Walton	7.57	1956	Ochs Acres	0.96	1989
Horseshoe Bend Estates	19.74	1956	Drummond Addn Amended	12.62	1989
Rio Vista Subd	26.51	1956	Mackie Subd	8.05	1990
Bowden	8.42	1956	Oak Run Estates Am Lots 51-53	4.15	1990
Big Bee Creek Subd No 2	8.76	1956	Ridge at Barton Creek	40.16	1990
Mrs. Rosa J. Spillman Estate	36.68	1956	Forest at Westlake	27.32	1990
S & S	18.00	1958	Kingston Subd	1.00	1990
Mooreland Addn	36.69	1958	Oak Hill Park Amended Lots 2 & 3	3.32	1991
Austin Lake Estates Sec 3	62.32	1959	Lewis Mountain Ranch Ph 2	46.04	1991
Austin Lake Estates Sec 2	66.05	1959	Summit at West Rim on Mount Larson	102.41	1991
Austin lake Estates Resub	2.28	1959	River Cove Subd	22.66	1991
Westwood Sec 1	15.68	1959	Blackburn Subd	4.97	1991
Lange Addn	14.45	1960	Klassen Addn	4.71	1991
Westoak Resub	8.52	1960	River Terrace	2.47	1991
Westlake Highlands Sec 2 Blk A-E	29.49	1960	Robinson Addn	7.38	1991

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Westlake Highlands Blk 1 & 2	12.07	1960	Rose Hill Subd.	9.94	1991
Geneva Estates Sec 1	56.44	1961	Slaughter Creek Acres Resub Lot 5	3.78	1991
Rivercrest Addn Sec 1	22.84	1961	Travis Settlement Sec 8	32.84	1992
Austin Lake Hills Sec 3	68.85	1961	Graef Road Estates	195.02	1992
Austin Lake Hills Sec 1	101.68	1961	Shady Hollow West AISD No 1	45.69	1992
Austin Lake Hills Sec 2	118.44	1961	John W. Woodruff Subd	14.23	1992
Westwood Sec 2	22.01	1961	Lewis Mountain Ranch Ph 3	36.68	1992
Barton Springs Estates Resub Lot 20	2.25	1962	Dominion Hill	37.86	1992
Lake Oak Estates No 2	70.24	1962	Barton Creek Club Driving Range	12.94	1992
Cardinal Hills Estates Unit 2	55.56	1962	Stauch Subd.	0.34	1992
Cardinal Hills Estates Unit 1	65.09	1962	Ravine Ph 1	27.31	1992
Lake Oak Estates Sec 1	44.21	1962	Davenport West Tr D Sec 1 Rob Roy Ph 3	68.49	1992
Silver Spur Ranchettes Sec 2	137.27	1962	Canyon Oaks	14.61	1992
Bothmer Addn	6.83	1962	J Hoover Mackin Addn	2.49	1992
Rockwood Subd	20.04	1963	Aqua Monte Sec 2 Amend Lots 9 & 10	4.47	1992
Lago Villa	5.29	1963	Burson Subd	9.94	1992
Manana West	6.52	1963	Boyer Acres	4.05	1992
Westwood Sec 3	12.42	1963	Diamond Sky Subd	55.08	1992
Wynnrock Estates Sec 1	76.90	1963	River Place Sec 3B	8.69	1992
Charles A. Garner Subd	2.91	1963	River Place Sec 3A	1.83	1992
George Milton, Jr. Subd	6.42	1963	Barton Creek Preserve Ph 1	19.67	1992
Aqua Verde Resub Lots L & M Blk G	0.19	1963	St Stephens School	245.33	1992
Westoak Sec 3	15.90	1964	Austin Lake Estates Sec 2 Amended	2.12	1992
Westlake Highlands Blk 2A	3.16	1964	Rocky Creek Estates Sec 2	70.50	1993
Lake Ridge Estates Sec 1	26.53	1964	Cravatt Subd	4.73	1993
Lake Austin Village	7.21	1964	Ridge at Thomas Springs Amend Lots 8-9	1.46	1993
Perkins Valley	14.77	1964	Willard Estates	3.71	1993
Sutherland Subd No 1	4.16	1964	Grape Creek Estates South	20.72	1993

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Aqua Verde	31.13	1965	Lookout Point	21.33	1993
Westlake Highlands Blk 3 Amend Lots 3 & 4	9.51	1965	Donna Glen Addn	3.27	1993
RN Goeth Subd	0.62	1965	Flying H Farms	9.55	1993
Westlake Highlands Sec 4	0.63	1965	McTeer Acres	4.10	1993
Aqua Monte Sec 2	24.24	1965	Lewis Mountain Ranch Ph 4	63.70	1993
Aqua Monte	23.75	1965	Patterson Place Sec 1	44.49	1993
Rolling Hills West	37.64	1965	Barton Creek Sec G Ph 1	88.46	1993
Rivercrest Addn Sec 2	20.04	1965	Lost Creek Sec 1 Amend Lots 14-15	1.14	1993
Westoak Sec 2 Resub Lots 16-19	5.84	1965	Hills of Lost Creek Sec 1 Resub Lot 2	0.59	1993
Rivercrest Sec 2 Resub Lot 66 Blk A & Lot 21 Blk D	0.46	1965	Bridgeview Terrace	10.04	1993
Akres Bonitos	1.89	1965	Rob Roy on the Lake Sec 1 Amended Lots 14 & 18	2.91	1993
Westlake Highlands Sec 2 Resub Lots 11-14	1.97	1966	Knight/Bash Subd	1.43	1993
Ridgecrest Subd	2.06	1966	Ravine Ph 2	2.03	1993
Westlake Highlands Lot 1 Blk 4	0.57	1966	Paddock at Commons Ford	35.72	1993
Westlake Highlands Sec 5 Ph 2 Revised	7.82	1966	VP Acres	12.01	1993
Hidden Hills Sec 1	31.11	1966	River Place Sec 3 Am Lot 11 Blk H	0.28	1993
Big Bee Creek	36.89	1966	Loma Graciosa Subd Resub Lot 7	7.05	1993
Big Bee Creek Subd No 2 Resub	4.62	1966	Madrones Subd	83.86	1993
Windy Cove Subd	9.66	1966	Barton Creek Preserve Ph 2	20.82	1993
Highland Creek Lake Subd Sec 1	56.28	1967	Barton Creek Preserve Ph 3	57.08	1993
Southview Estates	96.36	1967	Arrowhead Acres Addn	23.84	1993
Camelot Sec 1	29.63	1967	Jackies Gymnastics Subd	4.90	1993
Westlake Highlands Blk 6	7.92	1967	Crystal Mountain at Barton Creek Sec 2 1st resub am plat	46.76	1993
Lake Ridge Estates Sec 2	15.63	1967	Falls at Barton Creek Sec E Blk B	24.42	1993
Southwest Gate Addn	18.53	1967	Harkins/Wittig Resub Westview Est Sec 3 Lot 24	18.21	1993
Perkins Valley II	9.87	1967	Barton Creek Preserve Ph III	72.01	1993

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Mountain Creek Lakes Sec 1	117.50	1968	Barton Creek Preserve Ph III	72.73	1993
Pedernales Canyon Ranch Ph 1	471.36	1968	Lucky Lake Ranch Ph 1	9.91	1994
Hillside Springs	24.52	1968	Southwell Addn	4.13	1994
South View Estates Sec 2	66.79	1968	Rob Roy on the Lake Sec 3 Resub Lot 70 B	19.34	1994
Sigler Subd	2.39	1968	Lake Shore Annex #3	0.58	1994
Camelot Sec 2	22.68	1968	Senna Hills Sec 2	61.02	1994
Westlake Highlands Blk 3 Ph 2	1.80	1968	River Terrace Sec II	4.14	1994
Lake Ridge Estates Sec 3	24.77	1968	Tumbleweed Canyon	14.97	1994
Leigh Addn	1.01	1968	Kirchner Addn	1.78	1994
Freund Sleepy Hollow Lake Austin Subd	5.61	1968	River Place 7B	30.29	1994
Fulkerson Subd	3.22	1968	Overlook at River Place	25.15	1994
Perkins Valley Sec 4	7.67	1968	Penn Subd	1.14	1994
Mopac/360 No. 1	20.31	1968	River Pointe Am Lots 2 & 3	4.25	1994
Rayford Subd	3.07	1968	Reese Acres	0.06	1994
Offer Subd	2.98	1968	Preserve at Barton Creek	73.35	1994
Valley Lake Hills Sec 1	95.56	1969	Senna Hills Sec 1	11.97	1994
Spring Valley Estates	19.91	1969	Barton Cove Sec 1	5.04	1994
Blue Hills Estates	87.25	1969	Bosworth	1.42	1995
Camelot Sec 3	29.15	1969	Oconomowoc West Sec 1	64.18	1995
Westlake Highlands Blk 3 Ph 3	0.58	1969	Oak Run West Resub Lots 34-35	14.21	1995
High Oaks	10.74	1969	Shadowbye Acres	3.47	1995
Westlake Highlands Blk 3A	4.70	1969	Patterson Place on Crystal Creek	26.01	1995
Poole & Lane Subd	5.85	1969	Barton Creek Sec G Ph 1 Am Lot 30 & 31 Blk B	89.91	1995
Westlake Highlands Blk 3	2.22	1969	Island on Westlake	14.53	1995
Lake Ridge Estates Sec 4	21.43	1969	Davenport West Tr C Sec 3 St Stephens School	104.66	1995
Bruton Springs Reseb 50-51, 21 & 61	20.24	1969	River Hills Amend	19.90	1995

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Apache Shores Sec 2	217.08	1969	Akumal Subd	30.03	1995
Gary Patterson Subd	1.21	1969	City View Subd	1.21	1995
Mystic Oak Estates	53.90	1969	Senna Hills Sec 1A Amend Lots 57-64	2.35	1995
Southwest Gate Addn No 2	3.06	1969	Senna Hills Sec 1A	36.66	1995
Capitol View Estates	69.03	1969	Seven Oaks Sec 2 Ph 2	45.83	1995
Capitol View Estates Resub Lot 10, 11, 21, 22 & 23	23.07	1969	Austin Lake Hills Sec 1 Resub	2.00	1995
Capitol View Estates Resub Lot 14 & 15	8.78	1969	Manana West Sec 2 amended Plat Lots 9 & 10	10.30	1995
Bar S Ranch Subd #2	4.48	1969	Lake Pointe Ph 1A	17.32	1995
Bee Creek Hill Sec 1	16.38	1970	Lake Pointe Ph 1B Replat Lot 21 Blk H	2.27	1995
Twin Lake Hills	129.99	1970	Lake Pointe Ph 1A Resub Lot 15 Blk R	6.58	1995
Bee Creek Hill Sec 2 (remainder)	27.83	1970	Lake Pointe Ph 1B	51.34	1995
Southern Hills Sec 1	13.89	1970	Villas at River Place	16.02	1995
Westview Estates Blk C Amended	9.30	1970	Westminster Glen Ph 1A	8.53	1995
Geneva Estates Sec 1 Resub Lots 9-11 Blk A	3.43	1970	Panther Hollow East	9.69	1995
Westview Estates	62.58	1970	River Place Sec 10	10.77	1995
Scenic Brook Estates Sec 1	27.42	1970	River Place Sec 7C	0.39	1995
Hillside Springs Sec 2	40.70	1970	Steiner Ranch Ph 1 Sec 3	33.52	1995
Paisano Addn	2.00	1970	Illakee Subd	4.96	1995
Scenic View West Sec 2	4.12	1970	Two Creeks Addn	11.78	1995
Westlake Madrones Sec 1	1.61	1970	M.C. Graham Subd	1.79	1995
Cardinal Hills Estates Unit 7	110.78	1970	Southwest Hills Sec 2 & 3	17.81	1995
Cardinal Hills Estates Unit 6	47.82	1970	Southwest Hills Sec 2 & 3	14.77	1995
Cardinal Hills Estates Unit 11	101.07	1970	Edwards Crossing Ph A Sec 1	1.06	1995
Cardinal Hills Estates Unit 12	151.66	1970	Barton Creek Sec K	5.35	1995
Apache Shores Sec 4	18.71	1970	Hawthorn Ridge Subd	10.61	1995
W.E. Powell Subd	6.50	1970	Peak Lookout Place	1.71	1995
Slaughter Creek Acres Resub Lot 4 Blk C	3.01	1970	Ranchero Del L.A.	8.89	1995

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Slaughter Creek Acres Resub Lot 6 Blk C	1.55	1970	Best Technologies Center	69.37	1996
Slaughter Creek Acres Resub Lot 7 Blk E	3.55	1970	Scenic Ridge	38.36	1996
Slaughter Creek Acres Resub Lot 5 Blk F	3.39	1970	Angelwylde Sec 1	20.34	1996
Slaughter Creek Acres Resub Lot 4 Blk A	4.92	1970	Barton Creek Sec G Ph 2	74.98	1996
Perkins Park Sec 1	13.83	1970	Travis County MUD #4 Water Treatment Plant	2.29	1996
Slaughter Creek Acres Resub Lot 1,2 Blk E	2.00	1970	Lake Shore Addn Amended Lots 97 & 98	1.68	1996
Slaughter Creek Acres	15.44	1970	Jack Ball Estates	24.88	1996
Valley View West	10.91	1970	Lake Pointe Ph 2	61.37	1996
Inverness Point	23.91	1970	Lake Pointe Ph 1B Replat Lots 1-5 Blk Q	1.89	1996
Slaughter Creek Acres Resub Lot 6-7 Blk G	5.14	1970	Westcliff Sec 1A Am Lots 26 & 27	5.02	1996
Slaughter Creek Acres	3.42	1970	Long Canyon 3A	55.20	1996
Hazy Hills Ranchettes Sec 1	186.93	1971	River Place Sec 8	22.65	1996
Bear Creek Park	93.68	1971	Steiner Ranch Ph 1 Sec 4A	25.63	1996
Onion Creek Meadows	171.43	1971	Steiner Ranch Ph 1 Sec 4B	23.21	1996
Village Oak West	33.21	1971	Lake Country Estates Sec 2	18.37	1996
Granada Hills Amended Lots 3-8 Blk 3	165.33	1971	Lake Country Estates Amend Lots 7-10 Blk B	7.15	1996
Scenic Brook Estates Sec 1 Resub Lots 1-5 & 7-9	17.70	1971	Flint Rock Estates	8.73	1996
Scenic Brook Estates Sec 1 Resub Lot 30	2.14	1971	Barton Creek Preserve Ph 3 Am Lots 5 & 3A, 6A	23.39	1996
Scenic Brook Estates Sec 2 Re-Amended	79.06	1971	Glowka Acres Subd	6.64	1996
Scenic Brook Estates Sec 2 Re-Amended Resub Lot 7-11, 6 & 12	10.02	1971	Home Tech Subd	12.43	1996
Wilkerson Estates	65.08	1971	Austin Motor Mile Inc Subd	7.56	1996
McCormick Addn	1.02	1971	Salgado's Acres	3.92	1996
Knollwood Resub Lot 24-26	2.69	1971	Old Manchaca Subd	6.85	1996
Camelot Sec 3 Resub Lot 38-42	3.36	1971	Thornton Subd	0.33	1996
Camelot Sec 4	7.01	1971	Destiny Hills Sec 1	66.80	1997

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Canyon View West	3.12	1971	Southwest Territory Sec 3 Amended Lots 1,2,3	7.14	1997
Scenic View West Sec 3	0.40	1971	1626 Park Addn	20.14	1997
Canyon View Estates	8.04	1971	Scenic Brook Estates Sec 1 Resub Lots 10-11	6.17	1997
Westlake Highlands Blk 6A	0.95	1971	Estates of Lewis Mountain	44.87	1997
Westlake Highlands Blk 6A Resub Lots 3-4	0.79	1971	Barton Creek Sec E Ph 1	27.99	1997
Skyview Forest	4.36	1971	Palomino Ridge	70.02	1997
Smoky Ridge	4.33	1971	Gateway South Lot 2 at Barton Creek	6.38	1997
Price & Halton Addn	3.03	1971	Point at Barton Creek	73.48	1997
Apache Shores Sec 5	167.43	1971	Terraces at Barton Creek	19.45	1997
Slaughter Creek Acres Resub Lot 1 Blk G	3.24	1971	Barton Creek North Rim	60.67	1997
Slaughter Creek Acres Resub Lot 1-2 Blk F	7.81	1971	Barton Creek Club Third Replat	43.14	1997
Slaughter Creek Acres Resub Lot 6 Blk E	2.52	1971	Governor's Hill at Barton Creek	31.39	1997
Chappell Addn	6.60	1971	Barton Creek ABC Midsection	66.27	1997
Slaughter Creek Acres Resub Lot 2 Blk C	2.47	1971	Westview on Lake Austin Ph C Sec 5	16.99	1997
Slaughter Creek Acres Resub Lot 3 Blk C	3.00	1971	Summit Park Subd	10.08	1997
Slaughter Creek Acres Resub Lot 4 Blk E	3.50	1971	Lake Side Addn Resub Lot 27-28	3.00	1997
Slaughter Creek Acres Resub Lot 4 Blk F	4.99	1971	Carriage Crossing Sec 2	21.63	1997
Capitol View Estates Resub Lot 5	4.54	1971	Senna Hills Sec 4	26.54	1997
Penion Addn	5.44	1971	Senna Hills Sec 1B	9.85	1997
Slaughter Creek Acres Resub Lot 2 Blk G	4.58	1971	Aqua Monte Sec 2 Am Lot 5 Blk EE	4.13	1997
Slaughter Creek Acres Resub Lot 1-3 Blk A	19.63	1971	Austin Lake Estates Sec 1	90.08	1997
Norde Addn	5.02	1971	Saratoga Point	11.11	1997
Slaughter Creek Acres Resub Lot 5 Blk E	3.48	1971	River Terrace III	5.84	1997
Slaughter Creek Acres Resub Lot 2 Blk D	3.67	1971	Lake Pointe Sec 3 Ph 1	11.22	1997
Slaughter Creek Acres Resub Lot 8	2.80	1971	Lake Pointe Sec 3 Ph 4	13.86	1997
Rayford Subd #2	2.58	1971	Lake Pointe Sec 5	34.58	1997
Hamilton Hills	131.39	1972	Lake Pointe Ph 4A	28.00	1997

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Long Branch Valley	117.90	1972	Lake Pointe Ph 4B	6.30	1997
Shady Hollow Addn	56.77	1972	River Place Sec 11	53.15	1997
Twin Creek Park	42.78	1972	Glenlake 2A	18.97	1997
Arroyo Doble Sec 2	24.33	1972	Stoneridge Place Subd	5.19	1997
Arroyo Doble	15.20	1972	Sandbird Subd Sec 2 Am Lot 1-3	3.00	1997
Onion Creek Meadows Resub Lot 13-14	2.63	1972	Steiner Ranch Ph 2 Sec 3A	62.15	1997
Granada Hills Amend Resub Lots 132-133	2.00	1972	Steiner Ranch Ph 2 Sec 3B	16.88	1997
Westview Estates Sec 2	81.41	1972	Steiner Ranch Ph 1 Sec 4C	15.96	1997
Isabel Addn	1.91	1972	Illakee II Subd	9.27	1997
Scenic Brook Estates Sec 1 Ph 2	50.67	1972	Pawnee Peak Subd	10.03	1997
Scenic Brook Estates Sec 1 Resub Lot 13	2.07	1972	Wild Cherry Subd	9.74	1997
Scenic Brook Estates Sec 1 Resub Lots 24-29	5.55	1972	Crystal Mountain Executive Park	4.87	1997
Lost Creek Sec 1	75.66	1972	Brazos-Colorado Subd	9.66	1997
Camelot Sec 2 Ph 2	4.19	1972	Slaughter Creek Acres Resub Lot 5-6 Blk C	1.99	1997
Camelot Sec 1 Resub pt Lot 8	3.77	1972	Rob Roy on the Creek Sec 7 Replat	2.66	1997
Knollwood Resub Lot 10-11	3.60	1972	Westview on Lake Austin Ph C Sec 5	14.53	1997
Knollwood Resub Lot 18-22	6.92	1972	Barton Creek Sec J Ph 1	27.31	1997
Knollwood C Resub Part Lot 1	4.25	1972	Robie Acres, Second Amended plat	5.01	1997
Knollwood A	0.89	1972	C Bar Ranch Lakeview Acres Resub Pt Lot 1	0.77	1997
Knollwood B	1.01	1972	Shady Hollow West	59.52	1998
Westlake Highlands Sec 6	12.74	1972	Hill Country Ph 2A Am Lots 14 & 15	2.55	1998
Scenic View West Sec 4	9.78	1972	Michael Dale Subd	6.81	1998
Spence Addn	7.72	1972	Overlook at Lewis Mountain Sec 1	47.82	1998
Wild Basin #2	0.41	1972	Nassour Acres	15.73	1998
Lake Ridge Estates Sec 2A	1.98	1972	St Gabriel Catholic School	31.37	1998
Aqua Monte Sec 2 Resub Pt Blk E & D	10.98	1972	Barton Creek ABC West Ph 1	147.13	1998
Hillside Vista	7.90	1972	Cabin Ridge Estates	61.42	1998

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Rolling Hills West Sec 2	3.74	1972	Westview on Lake Austin Ph C Sec 2 Replat	43.84	1998
Apache Shores Sec 6	112.55	1972	High Oaks Amend Lots A & C	4.18	1998
Wilkerson Estates Resub Lot 12	7.47	1972	Westview on Lake Austin Ph B Amend Lots 27 & 28	1.22	1998
Wiley Pope Subd	6.50	1972	Buell-Rude Subd	1.90	1998
Capitol View Estates Resub Lot 4	4.51	1972	Rockcliff Bend Subd	2.99	1998
Webers Hill	5.76	1972	Sterling Acres	24.38	1998
Sutherland Addn	14.10	1972	Werkenthin Sec 4	12.28	1998
Lot 1-A Lane Addn	2.49	1972	Werkenthin Sec 2	9.34	1998
Rolling Hills West Resub Lots 4-5 Blk E	0.73	1972	Werkenthin Sec 1	17.23	1998
Hill Top Manor	17.02	1972	HA Reed Subd Resub Tr 1	6.25	1998
Hill Top Manor	2.12	1972	Werkenthin Sec 3 Amend Lots 1-13 Blk D&F	35.45	1998
Hill Top Manor	0.28	1972	Werkenthin Sec 5 Amend Lots 40-43 Blk D	22.46	1998
Hazy Hills Ranchettes Sec 2	72.97	1973	Werkenthin Sec 6	8.04	1998
Lick Creek Ranch Ph 2 Sec 1	117.26	1973	Oak Shores on Lake Austin Sec 4	13.28	1998
Shady Hollow Addn Sec 2 Ph 1	94.30	1973	Resaca Boulevard Street Dedication	2.95	1998
Twin Creek Park Sec 2	20.74	1973	Lake Pointe Sec 3 Ph 2	8.28	1998
Arroyo Doble Sec 3	16.49	1973	Lake Pointe Ph 4C	2.32	1998
Westview Estates Sec 3	147.23	1973	Lake Pointe Sec 3 Ph 5	7.02	1998
Hudson Tract Resub	1.05	1973	Lake Pointe Ph 1E	0.29	1998
Sigler Subd #2	2.97	1973	BHN Subd	1.97	1998
Camelot Sec 1 Resub Lot 1	2.37	1973	River Place Sec 21	21.48	1998
Camelot Sec 2 Resub Lot 22	2.04	1973	River Place Sec 22	45.94	1998
Camelot Sec 1 Resub Lot 9A	3.60	1973	River Place Sec 13	59.64	1998
William J Darilek Subd	2.75	1973	River Place Sec 12	31.55	1998
Camelot Sec 1 Resub Lot 15	1.07	1973	Westminster Glen Ph 1D	51.48	1998
Camelot Sec 2 Resub Lot 21	1.00	1973	Westminster Glen Ph 1E	42.54	1998

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Westlake Highlands Sec 7	15.32	1973	Westminster Glen Ph 1C	25.03	1998
RA House One	1.12	1973	Westminster Glen Ph 1B	9.28	1998
Westridge Estates	41.74	1973	Steiner Ranch Ph 1 Sec 5B	24.26	1998
Austin Lake Estates Sec 2 Resub Lots 9 & 10 Blk 7	0.63	1973	Steiner Ranch Ph 1 Sec 5C	44.38	1998
Stone Subd Resub Lot 1	2.28	1973	Riverfront Estates	26.50	1998
River Ridge	49.70	1973	Steiner Ranch Ph 1 Sec 4E	37.12	1998
Travis Oaks Trails	41.00	1973	Steiner Ranch Ph 2 Sec 3C	23.97	1998
Cardinal Hills Estates Unit 11 Rev Lot 23	4.06	1973	Steiner Ranch Ph 2 Sec 3D	17.82	1998
Apache Shores Sec 7	109.68	1973	Steiner Ranch Ph 1 Sec 5A	22.72	1998
Apache Shores Sec 7 Am Lot 57, 58	1.96	1973	River Bend	210.93	1998
C&D Addn	2.52	1973	Apache Shores Sec 6 Am Lots 7-10	2.13	1998
Appaloosa Run	115.61	1973	Palomino Ridge Amend Lots 9 & 10	10.50	1998
High Road View	1.26	1973	151 Acre Tract Subd	137.34	1998
Long Branch Valley Sec 2	85.67	1974	Lake Shore Addn Resub Lot 80	11.11	1998
Golden Lake Estates	12.68	1974	Madrone Ranch	189.94	1999
Kellywood Estates	13.18	1974	Barton Creek Sec J Ph 2	240.49	1999
Arroyo Doble Estates Sec 1	56.30	1974	Scenic Brook Estates Re-Amended Lots 2 & 3	3.34	1999
Arroyo Doble Sec 2 Resub 8 & 17 Blk A	4.05	1974	Scenic Brook Estates Sec 2 Re-Am Resub Lot 39	3.33	1999
Village Oak West Resub Lots 12 & 13	0.61	1974	West Austin Athletic Club	9.60	1999
Glen-Ledge Park	18.79	1974	Barton Creek Sec G Ph 2 Resub Lots 51-54 Blk B	2.22	1999
Southwest Hills Addn	18.67	1974	Summit at West Rim on Mount Larson Blk D Sec 1	36.31	1999
Mary Beth Gartner Addn	2.00	1974	Bishops Bend	8.71	1999
Hines & Bookout Subd	1.66	1974	Sendero Luminoso	5.53	1999
Barton Valley Resub Lot 7	7.29	1974	Simmit at West Rim on Mount Larson Blk D Sec 4	1.51	1999
Buie Subd	1.69	1974	Commons Ford Canyon	19.43	1999

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Camelot Sec 5	10.84	1974	Jacarandas at the Creek	6.50	1999
Barton Valley	40.88	1974	Fleecie Purnell Estate Subd	46.45	1999
Fortunes Valley	28.85	1974	Lake Pointe Sec 9 Amended Plat	39.00	1999
Barton Valley Resub Lot 6	5.49	1974	Lake Pointe Sec 3 Ph 3	10.79	1999
Camelot Sec 3 Resub Lot 57	3.85	1974	Strawn Subd	7.07	1999
Casa Diablo	2.44	1974	Lake Pointe Sec 7	40.16	1999
Woodlake Trails	22.48	1974	Lake Pointe Sec 4	12.76	1999
New Land	1.00	1974	Lake Pointe Ph 1C	0.28	1999
Anken Addn	1.00	1974	Lake Pointe Ph 1A Replat Lot 6 Blk O	0.31	1999
Manchaca Gardens Resub Lots 2-9 Blk B	5.66	1974	Lake Pointe Ph 1B Replat Lot 5 Blk O	0.32	1999
Slaughter Creek Acres Resub Lot 1 & Lot A Resub Lot 2	5.00	1974	River Place Golf Course	0.28	1999
Slaughter Creek Corner	3.78	1974	River Place Golf Course	202.79	1999
Fred Lucksinger Subd	11.78	1974	River Place Sec 15	78.75	1999
Ballard & Sons Inc Addn	0.83	1974	Westminster Glen Ph 1D Replat Lot 56-58	5.63	1999
Rolling Hills West Sec 4 1st Resub Lots 4-5	0.77	1974	Westminster Glen Ph 1C Replat Lots 18-20	4.01	1999
Granada Hills Resub Lot 177	0.71	1974	Westminster Glen Ph 1E Replat Lot 95-97	5.09	1999
Arroyo Doble Sec 3 Resub 5 & 6 Blk B	1.22	1975	Westminster Glen Ph 1E Replat Lot 82-84 & 88-90	6.04	1999
Knollwood Sec 2 Resub Part Lot 1,2,7	20.88	1975	Coldwater Sec 4 Ph C	1.49	1999
Brewer & Grandinetti Resub	0.99	1975	River Place Sec 10 Am Lots 11-13 Blk A	1.26	1999
Westlake Highlands Sec 8 Amended	27.15	1975	Stoneridge Price Subd	5.05	1999
Camelot West	4.43	1975	John H. Carrell Subd	3.00	1999
Dittmar-Hanson Subd	8.86	1975	JLG Subd	2.98	1999
Granada Estates Sec 1	102.04	1975	Flint Valley	5.22	1999
Westlake Highlands South Section	2.64	1975	Rob Roy West	1.97	1999
Crosswind	116.62	1975	Barrow's Lakeside Addn, Am Lot 2	3.12	1999
Louie T Bailey Subd	2.67	1975	Simmons-Williams	10.00	2000

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Lake Shore Addn Resub Lot 22	0.21	1975	Paleface Park Ph 1 Sec C Resub Lots 9 &10	17.63	2000
Luciano Castro Subd	19.27	1976	Werkenthin Sec 1 Blk C Lots 1 & 2 Amd	3.16	2000
Arroyo Doble Sec 4	50.08	1976	Werkenthin Sec 5 Blk F Lot 24 Amd	1.05	2000
Blue Hills Estates Resub	6.03	1976	Sonesh Estates	59.56	2000
Rawhide Ridge	7.28	1976	United Methodist Church Subd	9.24	2000
Appaloosa Run Resub Lots 35 & 36	39.95	1976	Barton Creek Sec M	181.49	2000
Lost Creek Sec 2	124.38	1976	Waldorf School	19.45	2000
Lost Creek Sec 2 Resub Lot 1 & 27	7.29	1976	Southwest Hills Sec 4	27.09	2000
Lake Side Addn Resub Pt Lot 47	6.71	1976	Hazelhurst Subd	77.34	2000
Slow Turtle Subd	20.18	1976	Overlook at Lewis Mountain Sec 2	48.05	2000
Wild Basin Wilderness	7.16	1976	Castle Ridge Acres	4.03	2000
Wild Basin #2	0.41	1976	Lake Side Addn Am Lots 40-42, 45, 46, 49, 50, 53 & 54	59.16	2000
Oestrick Addn	4.58	1976	Rivercrest Addn Sec 3	8.73	2000
Gentry Estates	5.74	1976	Seven Oaks Sec 4	55.36	2000
Austin World of Archery	43.20	1976	St Tropez Amended Lots 85A, 87A-B, 87E	2.29	2000
Boggy Creek Addn	52.20	1976	Summit at West Rim on Mount Larson Blk C	4.65	2000
Jerry Green Subd	0.87	1976	Senna Hills Sec 5B	38.46	2000
Wunneburger Estates I	2.66	1977	Tumbleweed Trail Estates Amend Lots 4 & 5	2.26	2000
Kellywood Estates Sec 2	20.09	1977	Werkenthin Sec 6 Amend Lots 35-38	2.65	2000
Arroyo Doble Sec 2 Resub Lot 2-3 Blk D	0.54	1977	Werkenthin Sec 2 Amend Lots 11-22	8.01	2000
Oak Hill Fire Dept Subd Lots 1&2 Ridge at Thomas Springs	0.32	1977	Porsch Subd	8.01	2000
Forest Park	22.77	1977	Seven Oaks Sec 5	232.77	2000
Granada Estates Sec 1 Resub Lots 16 & 17	1.97	1977	Lake Ridge Heights	8.86	2000
Camelot Sec 1 Resub Lot 12	2.90	1977	Werkenthin Sec 2 Amend Lots 11-14 Blk C	4.47	2000
Barton Valley Resub Lot 11-13 & 15-17	36.89	1977	Bruton Springs Subd Resub Lot 46	7.98	2000

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Camelot Sec 1 Resub Lot 13	2.40	1977	Lake Pointe Sec 8	4.52	2000
Hills of Lost Creek Sec 1	5.72	1977	Lake Pointe Sec 10	40.87	2000
Camelot Sec 2 Resub Lot 30	2.25	1977	Coldwater Sec 1 Am Lots 1&2	29.95	2000
Camelot West Sec 2	0.56	1977	Angelwylde Sec 2	11.11	2000
Baker Hills	12.52	1977	Angelwylde Sec 2	41.45	2000
Westlake Highlands Sec 2A	4.92	1977	Hood-Davis	5.26	2000
Kellam Westlake Highlands	0.50	1977	Gaines Ranch Subd & Gaines Ranch Subd II	15.62	2000
Larry Jameson Subd	7.67	1977	Troy Dale Patterson Subd	1.55	2000
HA Reed Subd	2.00	1977	Illakee III Am Lots 1 & 2	7.31	2000
Lake Ridge Estates Sec 2B	1.00	1977	Angelwylde Sec 3	15.21	2000
Austin Lake Estates Sec 1 Resub Lot 1 & 24	0.52	1977	Angelwylde Sec 3	21.52	2000
Manana West Sec 2	11.17	1977	Peyton Brooke at Rob Roy Replat	3.40	2001
Smoky Ridge Annex	2.23	1977	Bee Creek Commercial Center Sec 1	10.45	2001
Atkinson-North Lot 4 Blk A Oak Shores on Lake Austin Sec 4	1.66	1977	Tiburon Hills	26.48	2001
Barton Springs Estate Amended	3.10	1977	Roughin Hills	9.83	2001
Mountaintop Acres	51.23	1977	Lometa de la Luna	8.30	2001
Cherry Mountain Ph 2	21.06	1977	Charles Bell Subd	33.63	2001
Malone Addn Sec 3	2.00	1977	Scenic Brook Estates Sec 1 Amend Lots 19-21	2.62	2001
Mount Addn	0.78	1977	Cedar Ridge Estates	27.91	2001
Wild Basin Oaks	5.62	1977	Terraces at Barton Creek Amend Lots 6-8 Blk A	4.35	2001
Vista Oaks Sec 1	34.63	1978	Barton Creek Sec G Ph 2 Amend Lots 46-47 Blk B	1.59	2001
Long Branch Valley Sec 3	105.19	1978	Tierra Madrones Amend Lot 4 & Lot 2 Blk A Gardns of Westlake	3.92	2001
Southwest Territory Sec 1	38.58	1978	Rob Roy 360	16.82	2001
Southwest Territory Sec 3	7.88	1978	6836 Bee Caves Business Park	6.96	2001
Pittman Addn	3.91	1978	Kugler Subd	1.76	2001

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Thaxton Road Subd	37.90	1978	High Canyon Estates	15.22	2001
Larry L Vickers	10.05	1978	Seven Oaks Sec 2 Ph 2 Amend Lots 10 & 11	6.21	2001
Arroyo Dobe Est Sec 1 Resub Lts 1-8 B, Lot 1 C, Lts 1-5 D	43.38	1978	Lake Pointe Sec 6	17.16	2001
Verver Addn.	1.42	1978	River Place Sec 16	53.79	2001
Arroyo Doble Sec 2 Resub 3A & 4 Blk D	1.07	1978	Steiner Ranch Ph 1 Sec 8	215.33	2001
Granada Estates Sec 4	24.70	1978	Steiner Ranch Ph 2 Sec 5	218.89	2001
Granada Estates Sec 2	54.76	1978	Enclave at Kollmeyer Springs Subd	19.99	2001
Hill Country Ph 1	3.16	1978	11505 Texas 71 Ph 1	166.81	2001
Ridge at Thomas Springs	31.84	1978	Bluffs of Flintrock	10.35	2002
Glen at Thomas Springs	24.80	1978	Spillman Ranch Ph 1 Sec 5	17.53	2002
Granada Estates Sec 3	35.37	1978	Travis Settlement Business Park	29.83	2002
Granada Estates Sec 5	21.60	1978	Laws Addition No.2	1.60	2002
Smokey Mountain Oaks	52.17	1978	Travis Settlement Sec 3 Resub of Lots 177,178,179,181,182,18	13.18	2002
Lost Creek Hilltop	22.12	1978	Travis Settlement Sec 3 Resub Lots 176 & 177	4.66	2002
Lost Creek Blvd	12.27	1978	Frnka	3.06	2002
Hills of Lost Creek Sec 3	18.18	1978	Valley Lake Hills Sec 1 Rev Lots 14 & 15 Block DD	0.35	2002
Lost Creek Sec 1 Resub Pt Lot 42 Blk 14	15.99	1978	Davenport West - Block B Lot 33 &34	19.75	2002
Valley at Lost Creek Ph 2 plus common area	1.38	1978	Flintrock at Hurst Creek Sec 8 Amended	0.68	2002
Bull Mountain Ph 1	13.57	1978	Twin Lake Hills Replat Lots 60 & 61	0.47	2002
Brooks Place	0.85	1978	Las Lomitas	88.34	2002
Rosalie K Rogers Subd	0.72	1978	Twin Lake Hills Replat of Lots 112 & 113 Blk PP	0.41	2002
FC Maseles Subd	2.62	1978	Twin Lake Hills, Replat Lots 33 & 34	0.59	2002
Laguna Loma	6.63	1978	Harp Subd	9.26	2002
Rio Robles Sec 1	34.80	1978	Cloyd Land	4.88	2002
Lake Ridge Estates Sec 2 Resub Lot 6-8	1.74	1978	Barton Creek Sec H	20.00	2002

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Deer Creek	53.38	1978	Foothills of Barton Creek	87.20	2002
Glenlake Ph 1	213.75	1978	Davenport West Tr C3 Sec 2 Point at Rob Roy Am 9&10	5.67	2002
Milstead Addn	1.34	1978	Birdlip Subd	42.92	2002
Round Mountain Sec 2	1.07	1978	Seven Oaks Sec 2 Ph 2 Amend Lots 2 & 3 Blk B	5.93	2002
Majestic Hills Ranchettes 2	17.57	1978	River Place Sec 26	70.75	2002
Southland Oaks Sec 1	55.60	1978	Westminster Glen Ph 3	88.34	2002
Slaughter Creek Acres Resub Lot 3 Blk B	2.99	1978	Gomillion's Subd	8.27	2002
Slaughter Creek Acres Dorsey Resu Lot 3 Blk G	4.72	1978	Steiner Ranch Ph 1 Sec 9	155.32	2002
Nations Rainbow Canyon	0.54	1978	River Ridge Amend Lots 2-4	0.90	2002
Stone Subd Resub Lot 2	5.11	1978	River Dance Ph 1	101.74	2002
Majestic Hills Ranchettes	83.16	1978	Foley Subd	7.34	2002
Stone Subd	1.67	1978	Capital View Estates Resub Lot 16	4.29	2002
Bruton Springs 1st Resub Lots 5, 6	1.29	1978	Foothills of Barton Creek Am 36A Blk E	5.04	2002
La Tierra De Los Pedernales Sec 1	15.20	1979	Medway Ranch Sec 1	36.25	2002
La Tierra De Los Pedernales Sec 2	13.90	1979	Nalle Woods	0.01	2003
Clover Hill	111.95	1979	Highland Creek Lakes Sec 1 Replat of Lots 54 and 53 Blk H	0.38	2003
Arroyo Doble Estates Sec 2A	12.77	1979	Broken Oar Ranch	9.70	2003
Shady Hollow Sec 2A Ph 1	33.57	1979	Mountain Creek Lakes Sec 1 Rev Lots 38 & 39 Blk O	0.67	2003
Shady Hollow Sec 5 Ph 1	33.07	1979	Twin Lake Hills Replat of Lots 1&2, Blk YY	1.21	2003
Shady Hollow Sec 5 Ph 2	27.89	1979	Mountain Creek Lakes Sec1 Resub of Lots 5&6, Blk M	0.46	2003
Hinton Estates	2.46	1979	Twin Lake Hills Rev Lots 3, 4, 5 & 6 Blk XX	1.12	2003
Spring Valley	36.96	1979	Cypress Ranch Commercial	8.45	2003
Larson Estates	66.93	1979	Tres Vistas	38.02	2003
Hal Haralson Subd	15.00	1979	Spanish Oaks Sec 5	5.06	2003
Tanglewood West	34.68	1979	La Vista	10.04	2003

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
McKownville II	85.21	1979	Porter Subd No 2	20.75	2003
Sunrise Country	82.92	1979	Amarra Drive (Wynton Place)	5.49	2003
Valley at Lost Creek Ph 3 plus common area	2.98	1979	Angelwylde Place	4.64	2003
Hills of Lost Creek Sec 9	11.89	1979	J&S Subd Resub Lot 1 Blk B J Hoover Makin Addn	2.46	2003
Hills of Lost Creek Sec 7A	19.54	1979	High Road	2.85	2003
Valley at Lost Creek Ph 1 plus common area	4.57	1979	6D Ranch	613.32	2003
Hills of Lost Creek Sec 2A	0.57	1979	Werkenthin Sec 5 Amend Lot 45	5.56	2003
Best Part of Lost Creek	0.85	1979	Seven Oaks Sec 2 Ph 2 Amend Lots 15-17	6.47	2003
Bull Mountain Ph 2	18.07	1979	Seven Oaks Sec 2 Ph 2 Resub Lot 1 Blk A	6.58	2003
Robin Estates	2.32	1979	Westminster Glen Ph 3 Am Lots 47-50	10.89	2003
Bee Cliffs	2.08	1979	River Place Sec 22 Am Lots 142-145	1.02	2003
Bull Mountain Ph 1A	2.16	1979	Steiner Ranch Ph 1 Sec 6B	80.89	2003
Rob Roy Ph 2	349.79	1979	Steiner Ranch Ph 1 Sec 10A	780.62	2003
Rob Roy	204.60	1979	Steiner Ranch Ph 1 Sec 6D	56.73	2003
Lillian & Richard Creasy Subd	1.61	1979	Steiner Ranch Ph 1 Sec 6C	39.94	2003
Capitol Ridge Addn	17.21	1979	Steiner Ranch Ph 1 Sec 6F	77.22	2003
Briarpatch	16.07	1979	Steiner Ranch Ph 1 Sec 6A Replat	28.19	2003
Richard J Kaiser Subd	1.55	1979	Steiner Ranch Parkside	73.32	2003
Westlake Crossroads	18.86	1979	Steiner Ranch Ph 1 Sec 10B	85.39	2003
Barton Valley Sec 2	5.53	1979	Steiner Ranch Ph 1 Sec 6E	72.06	2003
Lost Valley Estates	11.96	1979	Overlook at Kollmeyer Springs Subd	13.16	2003
Mercado Heights	3.16	1979	Apache shores Sec 7 Am Lot 44-45	1.41	2003
Bluff Springs Estates	11.64	1979	Apache Shores Sec 7 Am Lot 15-17	1.64	2003
Valdez Acres	1.02	1979	Fox Creek Estates	11.25	2003
Johnie F Plumley Addn	0.50	1979	11505 Texas 71 Ph 2	25.19	2003
Barton Creek Square	0.42	1979	Barton Creek Sec H Ph 3	13.98	2003
Barrow's Lakeside Addn	4.73	1979	Nalle Woods Subd	45.85	2003

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Peter's & Joyce's Addn	4.27	1979	Cyrus Subd	12.73	2004
Southwest Territory Sec 2	3.19	1980	Robichaux Addn	2.04	2004
Conroy Park No 1	13.77	1980	Travis Oak Trails Am Lots 4 & 5 Blk B	0.68	2004
Shady Hollow Sec 3A Ph 3	19.69	1980	Flint Rock Hill Resub Lot 2	2.62	2004
Shady Hollow Sec 3A Ph 2	20.65	1980	Lakehurst Rev Lt 15 & 16 Tr 6	0.42	2004
Shady Hollow Sec 3A Ph 1	25.51	1980	Travis Vista Business Park	9.08	2004
Shady Hollow Sec 2A Ph 2	64.46	1980	Highland Creek Lakes Rev Lots 69, 70, 71 Blk H	0.97	2004
Chaparral Village Amended	0.16	1980	Sky Forest	12.11	2004
Granada Estates Sec 6	70.46	1980	Round Mountain Amend Lot 21 & 22	1.49	2004
Hills of Lost Creek Sec 5	28.22	1980	Overlook at Flintrock Falls	5.85	2004
Bluffs of Lost Creek	47.95	1980	West Cypress Hills Ph 1 Sec 1	67.56	2004
Lost Creek Sec 4	1.33	1980	Spanish Oaks Sec 3	19.98	2004
Emerald Bay	4.72	1980	Spanish Oaks Sec A	27.81	2004
Napier Addn	1.75	1980	Cypress Banks	11.91	2004
Lake Ridge Estates Sec 2C	1.65	1980	Exa Preslar Subd	11.47	2004
Penny L Baker Subd	2.14	1980	Barton Creek Sec N	59.78	2004
RLD Addn	5.56	1980	Alexan Mountain View	29.83	2004
Lakeside Terrace Lot 9-18 Lake Austin Village	10.44	1980	Old Bee Cave Subd	37.05	2004
Hardin Subd	12.21	1980	Collings Subd	13.08	2004
Malone Addn Sec 4	0.55	1980	Barton Creek ABC West Ph 2	120.25	2004
Francis Benoit Subd	1.35	1980	Wimberly Place	8.09	2004
Malone Addn Sec 5	0.50	1980	Wimberly Place	3.99	2004
Velasquez Subd	1.24	1980	Davenport West Tr C3 Sec 2 Point at Rob Roy Am 6&7	6.55	2004
Live Oak Community Cemetery	7.24	1980	Eanes Canyon Estates	12.84	2004
Chaparral Village	3.98	1980	Sterling Acres Amend Lots 10 & 11	2.00	2004
Barton Creek Bluff Sec 1	9.88	1980	River Place Sec 25	47.34	2004
Walter Thomas Jones Subd	2.66	1981	Panther Hollow Creek Ph 1	20.49	2004

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Ashley Oaks	74.26	1981	Gomillion's Subd Resub Lot 1 & 2	4.33	2004
Fox Run Ridge	66.85	1981	Schmidt Addn	12.27	2004
MCI West	6.99	1981	Steiner Ranch Ph 1 Sec 6G	78.20	2004
Crystal Creek	17.79	1981	Steiner Ranch Pardside Amend Lot 88 & 93	2.58	2004
Barton Bend	74.98	1981	Spanish Oaks Ph 2B	36.48	2004
Barton Creek Highlands	29.06	1981	Tierra Del Caballo Sec 1	8.10	2004
Lost Creek Sec 3A	79.22	1981	Kato's Place	9.04	2004
Estates Above Lost Creek	318.37	1981	Slaughter Creek Acres Replat Lot 6B Blk E	2.50	2004
West Rim	81.12	1981	Fitzhugh Ranch Sec 1 Am Lt 11, 12 Blk A & Lt 39 Blk A	5.94	2004
Bull Mountain Ph 4 Sec 1	37.59	1981	Perkins Subd	2.80	2004
Woodlake Trails Amended	14.66	1981	Greenshores on Lake Austin Ph 1	0.73	2004
Tumbleweed Trail Estates	3.41	1981	River Place at Panther Hollow Creek Ph 1	6.04	2004
Long Canyon 1A	127.97	1981	Exa Preslar Subd	2.01	2004
Glenlake Ph 2	142.05	1981	Greenshores on Lake Austin Ph 1	86.87	2004
Barton Creek Bluffs Sec 5	48.41	1981	Cypress Ranch Blvd Roadway Dedication	5.69	2004
Barton Creek Bluffs Sec 3	46.88	1981	West Cypress Hills Ph 1 Sec 1 Replat Lots 7 Blk 1	0.52	2004
Cedar Bluff Research Park Sec 1	110.06	1981	Capitol View Estates Resub Lot 26	5.00	2005
Willis Subd	10.00	1981	Vista Royale Ph 3	5.69	2005
Manchaca Commercial Park	12.92	1981	Rland Subd.	12.78	2005
Wild Wood Hills II	5.34	1981	Vista Royale Ph 1	38.36	2005
Texas Commerce Bancshares Subd	5.55	1981	11505 Texas 71 Ph 1 Replat Lt 10 Blk D	1.49	2005
Bluebell Ridge	87.25	1982	Spanish Oaks Replat Lot 5 Blk A	4.69	2005
DC Estates	13.13	1982	Preserve at Barton Creek Amend Lots 5,6,7, Blk A	3.84	2005
Blue Hills Estates Sec 2	5.82	1982	Lake Pointe Ph 5A Replat Lots 62, 63 Blk A & Lot 13 Blk N	0.82	2005
Oak Hill Park	1.04	1982	Bee Creek Vistas	14.01	2005

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Glen-Ledge Park 1A	11.08	1982	Ranches at Hamilton Pool	823.41	2005
Glen-Ledge Park 2A	11.69	1982	Senna Hills Sec 7	28.64	2005
McDonell Estates	4.89	1982	Turner Addn.	2.65	2005
George Bauer Subd	2.02	1982	Vista Verde	7.25	2005
Levbarg Estates	9.99	1982	Harbor Hill	9.65	2005
Barton Valley Sec 8 plus 1/2 vac street	6.72	1982	Travis Settlement Sec 1 Ph 1 Resub Lots 1-31 & 45-54	17.57	2005
Barton Creek Highlands Sec 1A	4.95	1982	Rimrock Trail	14.52	2005
Lost Creek Sec 4A	5.21	1982	Barton Creek Sec G Ph 2 Amend Lots 2-3 Blk D	1.10	2005
Hills of Lost Creek Sec 4 Ph A	36.86	1982	Barton Creek Sec H Ph 2	70.41	2005
Hills of Lost Creek Sec 4 Ph B	30.90	1982	Barton Creek Sec E Ph 2	27.84	2005
Lost Creek Estates Ph 1B	24.69	1982	Summit at West Rim on Mount Larson Blk D Sec 1 Am 18-20	4.13	2005
Bunny Run One	1.88	1982	Whitethorn Subd Amend Lots 5&6	4.37	2005
Lost Canyon Ranch #2	6.81	1982	Perro Cafe	2.00	2005
Tumbleweed Place	3.00	1982	Werkenthin Sec 6 Amend Lots 31-34 Blk D	7.20	2005
Leavitt Subd	2.11	1982	Austin Lake Hills Sec 1 Resub Lot 1 Blk 49	4.15	2005
Robbin Road Addn	0.99	1982	River Place Sec 17	13.92	2005
El Seems Estates	1.98	1982	Webb Addn	2.95	2005
Freund-Keeworth Subd	2.03	1982	Preserve at Lost Gold Cave Ph 2	12.17	2005
Cielito De Catros Subd	29.66	1982	Preserve at Lost Gold Cave Ph 1	10.74	2005
John Gray Subd	4.63	1982	Rio Vista Parcel 3A	18.54	2005
Harold Hicks Subd	7.99	1982	Steiner Ranch Ph 1 Sec 7A	130.45	2005
Welch Addn	1.07	1982	Steiner Ranch Ph 1 Sec 7B	85.51	2005
Rob Roy Ph 3	37.79	1982	Longhorn Village at Steiner Ranch	55.18	2005
Stagecoach Ranch Sec 5	48.09	1983	Steiner Ranch Ph 1 Sec 10C	48.16	2005
Stagecoach Ranch Sec 1	23.88	1983	Steiner Ranch Ph 1 Sec 8E	7.14	2005
Stagecoach Ranch Sec 3	148.06	1983	River Dance Ph 2	147.49	2005

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Hammett's Crossing	230.64	1983	Apache Shores Sec 6 Am Lot 2-4 Blk U	1.55	2005
Coulver Estates	156.91	1983	Scanlon Addn	1.06	2005
Hawks Hill Subd	5.76	1983	Greenshores on Lake Austin Ph 2	1.00	2005
Shady Hollow Sec 3B	49.50	1983	Greenshores on Lake Austin Ph 3	0.54	2005
Hills of Lost Creek Sec 8	35.18	1983	Greenshores on Lake Austin Ph 2	42.52	2005
Crystal Mountain at Barton Creek Sec 1	88.97	1983	Greenshores on Lake Austin Ph 3	31.17	2005
Rob Roy on the Lake Sec 3	30.68	1983	Senna Hills Sec 6	31.39	2006
Rob Roy on the Lake Sec 1	224.13	1983	Spanish Oaks Sec 5B	4.41	2006
Rob Roy on the Lake Sec 2	206.84	1983	Crosswind Subd., Rev Lots 74 & 81	3.22	2006
Lake Ridge Estates Sec 3A	1.42	1983	Spanish Oaks Sec 3B	17.23	2006
Rio Robles Sec 2	90.03	1983	Belvedere Ph 1	140.49	2006
Long Canyon Ph 1A Am Lot 9 & 10	3.34	1983	Spanish Oaks Sec 7	60.32	2006
Glenlake 3 PUD	19.09	1983	Pedernales Summit Parkway Road Dedication	0.57	2006
Rio Vista Ph 1 Sec 1	2.88	1983	Vaught Ranch Sec 2	95.12	2006
Malone Addn Sec 6	1.91	1983	Sweetwater Sec 1 Blk B Lot 17 A	12.21	2006
Estates Above Lost Creek Sec 3	1.57	1983	Sweetwater Sec 2 Pedernales Summit Parkway Ph a	0.19	2006
Travis Settlement Sec 2	132.82	1984	River Dance Ph 3	65.86	2006
Travis Settlement Sec 7	69.20	1984	Cypress Creek Ranch	1151.76	2006
Ralph K. Williams	7.84	1984	Spanish Oaks Sec 3C	8.69	2006
Travis Settlement Sec 5	141.53	1984	Lodge at Hammett's Crossing	35.68	2006
Travis Settlement Sec 3	141.72	1984	Travis Settlement Ph 1 Sec 2	91.31	2006
Travis Settlement Sec 1	102.17	1984	Overlook on Bee Creek	19.68	2006
Travis Settlement Sec 4	120.26	1984	Spanish Oaks Sec 8	53.57	2006
Travis Settlement Sec 6	110.00	1984	Ranches at Hamilton Pool, Rev Lots 8,9,14,15 Blk !	182.44	2006
Turnersville Estates	39.47	1984	Amarra Drive Ph 1	34.67	2006
Arroyo Doble Sec 2	30.10	1984	Yachtman Resub Lot 5 Blk A Fleecie Purnell Estate	31.90	2006

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Shady Hollow Sec 6 Ph A	28.97	1984	West Cypress Hills Ph 1 Sec 3A	28.02	2006
Shady Hollow Sec 4	33.30	1984	West Cypress Hills Ph 1 Sec 2	29.42	2006
Shady Hollow Sec 6 Ph B	28.14	1984	Noack Hill	7.96	2006
Shady Hollow Sec 6 Ph C	36.60	1984	Esquivel Subd	7.20	2006
Shady Hollow Sec 6 Ph D	26.15	1984	Draper Subd	5.00	2006
Arroyo Doble Sec 2C	16.10	1984	Pedernales Electric Coop Circle Dr Austin	66.44	2006
Granada Estates Sec 6 Amend Lots 38-39 Blk L	1.13	1984	Southwest Hills Sec 4 Am Lots 6-8 Blk B	3.04	2006
Kenny Addn	3.49	1984	Bee Cave West	9.80	2006
Watson-Fuller Oaks	4.09	1984	Rob Roy West Am Plat	33.48	2006
Ryswyk Estates	40.45	1984	Estates Above Lost Creek Amend Lots 43-45 Blk A	8.73	2006
Signal Hill Subd Ph 2	16.01	1984	Senna Hills Sec 11	23.77	2006
Summit Subd	5.00	1984	Bruton Springs Amend Lot 37, 15 Sterling Acres	8.05	2006
Critter Canyon	35.53	1984	Werkenthin East	4.00	2006
Rob Roy on the Creek Sec 1	41.21	1984	Werkenthin Sec 5 Resub Lot 44 Blk D	1.52	2006
Rob Roy on the Creek Sec 5	88.48	1984	Coldwater Sec 4 Ph B	22.01	2006
Rob Roy on the Creek Sec 6	157.32	1984	Coldwater Sec 4 Ph A	24.66	2006
Hills of Lost Creek Sec 10	26.50	1984	Westminster Glen Ph 1E Am Lot 88-89 A	4.03	2006
Barton Creek West Blk 4	183.58	1984	Panther Hollow Creek Ph 2	20.46	2006
Barton Creek West Blk 1	62.29	1984	River Place Sec 26 Resub Lot 1 Blk B	9.08	2006
Barton Creek West Blk 5	115.15	1984	River Place Sec 22 Am Lots 168 & 169 Blk A	0.51	2006
St. Michaels Academy	49.98	1984	River Dance Sec 5	66.19	2006
Bluffs of Lost Creek Am Lot 57-58	0.89	1984	River Dance Sec 4	35.50	2006
Rob Roy on the Creek Sec 3	47.88	1984	Apache Shores Sec 2 Am Lot 521, 522	0.57	2006
Green Park Sec 3	38.01	1984	FM 1626 Office Warehouse Subd	13.20	2006
Luth Subd	5.48	1984	Enclave at Alta Vista South	100.64	2006
West Rim Amend Lots 8-9	1.33	1984	Estates of Rockcliff	4.66	2006

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Rob Roy on the Creek Sec 2 Lot 104 Blk A	12.55	1984	Pecan Bottom on the Lake	1.02	2006
Davenport Ranch Ph 6 Sec 1	60.26	1984	Belvedere Ph 2	93.03	2007
Bee Creek Hills Addn	41.60	1984	Spanish Oaks Sec 9	93.09	2007
Westlake Highlands Blk 1A Amend Lots 3-4	5.83	1984	Silver Spur Ranchettes Sec 2 Resub Lot 5	36.79	2007
Scott-Thomas Subd	1.72	1984	11505 Texas 71 Amend Lots 6 & 7 Blk A	0.88	2007
Josephine Subd	0.84	1984	Lakehurst Rev Lots 50-52 & 49 & .3 ac.	5.04	2007
Lednicky Subd	4.07	1984	Spanish Oaks Golf Villas	18.96	2007
Westcliff Sec 1A	59.06	1984	Amarra Drive Ph 2	89.22	2007
Long Canyon 2C	8.45	1984	Colonia Serendipity	23.49	2007
River Place Water Storage Site	11.09	1984	River Dance Sec 4 partial vacation & replat	22.94	2007
River Place Sec 1	43.73	1984	CC Carlton Subd	10.44	2007
River Place Treatment Plant	13.79	1984	Edelmon Estates	19.97	2007
River Place Sec 3	17.72	1984	Barton Creek Sec H Ph 4	103.69	2007
Signal Hill Subd Ph 1	3.51	1984	Senna Hills Sec 10	10.60	2007
Watson Park IIIA	8.37	1984	Austin Lake Estates Sec 1 Amend Lots 3 & 4 Blk 15	0.69	2007
Shady Hollow Estates Ph B	38.84	1984	Steiner Ranch Ph 1 Sec 10D	35.30	2007
Shady Hollow Estates Sec 3	10.08	1984	River Dance Ph 6A	84.96	2007
Shady Hollow Estates Sec 1	163.88	1984	River Dance Ph 6B	21.80	2007
Southland Oaks Sec 2	60.88	1984	Palomba Addn No 2 Amend Replat Lots 2-7	8.12	2007
Oak Run Estates	134.36	1984	Lynnbrook Condo Subd	3.85	2007
Rob Roy on the Creek Office Park	5.22	1984	Malone Addn Sec 1 Am Lot 7&8 Blk A	1.86	2007
Rob Roy on the Creek Office Park	10.07	1984	Malone Addn Sec 1 Am Lot 7&8 Blk A	9.81	2007
Saddletree Ranch Sec 3	215.19	1985	Olympic Heights Outlot #2	0.90	2007
West Cave Estates Sec 2	69.97	1985	Belvedere 2A	3.30	2007
West Cave Estates Sec 1	51.27	1985	Steiner Ranch Ph 1 Sec 10D	25.28	2007
Woods of Bear Creek	63.91	1985	Steiner Ranch Ph 1 Sec 10D	2.93	2007
Jesse Castro No 2	9.70	1985	Steiner Ranch Lake Club	2.63	2008

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Hunters Ridge	36.99	1985	Senna Hills Sec 8	12.62	2008
Arroyo Doble Sec 2B	8.13	1985	Travis Settlement Sec 4 Rev Lots 256 & 257	8.99	2008
Fleeman Estates	12.57	1985	Hollow at Slaughter Creek Sec 1	29.55	2008
Hill Country Ph 2A	116.34	1985	Woods of Greenshores Sec 1	59.78	2008
Granada Oaks	68.29	1985	Moughanni Subd	9.44	2008
Centex-Larson Subd	17.42	1985	Belvedere Ph 3	37.85	2008
Ledgeview Addn	9.80	1985	Villas on Blacksmith Cove	13.06	2008
Oak Run West	116.44	1985	Overlook at Pawnee Pass	3.18	2008
Maxson-Grant Subd	10.04	1985	Slaughter Creek Acres Resub Lot 1 Blk D	5.05	2008
Rob Roy on the Creek Sec 8	8.39	1985	Miller Subd	0.47	2008
Barton Club Drive	3.05	1985	Belvedere Ph 4	52.51	2008
Barton Creek West Blk 3	173.42	1985	Palisades West Amended Plat of the Amended Plat	22.35	2008
Barton Creek West Blk 2	124.60	1985	River Dance Ph 7A	39.71	2008
Barton Creek West Blk 1A	7.42	1985	Cherry Mountain Ph 2 Resub Lots 1-3, 9, 10	12.09	2008
Estates of Barton Creek Sec 2A	10.10	1985	River Dance Ph 7B	41.24	2008
Estates Above Lost Creek Amend Lot 39 & 40	2.35	1985	Vincent Subd	4.51	2008
Hills of Lost Creek Sec 2 Am Lot 12-13	0.78	1985	Greenshores on Lake Austin Ph 2 Am Lots 32, 33, 34, 39	3.12	2008
Voelzel Acres	2.35	1985	Senna Hills Sec 9	11.92	2009
Lakeplace Subd	9.38	1985	Hilltop Manor Rev Lot 1 Blk FFF & 19 RR Twin Lake Hills	0.72	2009
Tierra Madrones	47.15	1985	Amarra Drive Ph 3	233.43	2009
BF&Q Subd	2.21	1985	RGK Commercial Unit A Lot 15 B Blk 2	2.12	2009
Mount Larson South Ph 2A	17.70	1985	Bee Creek Hill Estates	8.92	2009
Little Bee Creek Estates	3.19	1985	Schuknecht Subd	4.79	2009
St Tropez PUD	17.47	1985	Grace Hill	2.92	2009
Rockcliff Estates PUD	13.87	1985	Lone Star Bank Subd	9.70	2009

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Long Canyon 2B	386.28	1985	Sutter Hall Subd	10.81	2009
River Place Sec 9	65.95	1985	River Terrace IV	2.17	2009
Westminster Glen Ph 1	107.59	1985	Belvedere Ph 1 Rev Lots 38, 40 Blk D	2.52	2009
Hennig Heights I	35.90	1985	Belvedere 2A Rev. Lots 107, 108 & 109 Blk A	8.46	2010
Shady Hollow Estates Sec 2 Amended	99.16	1985	Montebella Subd	41.82	2010
Guajardo Subd	12.41	1985	Belvedere Ph 5	15.60	2010
Malone Addn Sec 7	10.19	1985	Tres Vistas Rev Lots 23 & 24	2.13	2010
Highway 290 West Addn	5.98	1985	Noack Hill, Rev. Lot 3,4 Blk A	2.13	2010
Bee Creek Hills Addn Lot 1A	1.96	1985	Summit 56	0.36	2010
Malone Addn Sec 7	4.58	1985	Touba Estates	15.98	2010
David S. Minter Addn	0.54	1985	Crooked Cedar Ranch	10.02	2010
Malone Addn Sec 7	4.50	1985	O&A Guerra Subd	2.98	2010
The Preserve	48.15	1985	Sweetwater, Pedernales Summit Parkway Sec 1	7.29	2010
River Place Sec 5	15.04	1985	Angelwylde Sec 3 Resub Lot 9	40.35	2011
Mason	5.20	1986	Rocky Creek Ranch Sec 1 Replat	159.15	2011
West Cave Estates Sec 4	282.64	1986	Sola Vista Sec 1	1.02	2011
Fitzhugh Ranch Sec 1	59.02	1986	Ridgeview Ph 1	59.83	2011
Texana Oaks	24.87	1986	Belvedere 2A Rev. Lots 31, 32 Blk D	2.37	2011
Southneast Park Addn	4.96	1986	NOAH ESTATES	6.49	2011
St. Alban's Addn	14.74	1986	Lake Pointe Ph 1B Rev Lots 6,7 Blk Q, Lot 7A Blk Q Ph 1E	0.60	2011
Enclave at Shady Hollow	6.07	1986	Travis County EMS #5	13.61	2011
Appaloosa Run Sec 1A	11.51	1986	Travis Settlement Sec 6, Rev 368-370 pt Lots 367, 371	10.31	2011
Overlook Estates Ph 1	80.13	1986	West Cypress Hills Ph 1 Sec 4 Cypress Ranch Blvd	2.94	2011
Ramar Addn	1.51	1986	West Cypress Hills Ph 2 Sec 1 Cypress Ranch Blvd	1.41	2011

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Lost Creek Sec 2 Am Lot 19-20	1.21	1986	West Cypress Hills Ph 3 Sec 1 Cypress Ranch Blvd	1.65	2011
Whitehorn Subd	10.70	1986	Hazy Hills Office Park	18.57	2011
Toro Canyon	9.99	1986	West Cypress Hills Ph 1 Sec 4a	31.32	2011
Smith-Holley Addn	2.78	1986	Kellywood Estates Sec 2 Resub Lot 2	4.06	2011
Bee Creek Hills Addn Lot 29A	1.05	1986	Steiner Ranch Ph 1 Sec 10D Resub 303-315 Blk A & Lot 4 Blk F	17.94	2011
McBrine Subd	7.71	1986	Caldwell-Abeyta	7.76	2011
Lake Shore Annex #2	2.99	1986	Sweetwater Sec 1 Village G 1	20.98	2012
Austin Lake Hills Sec 3 Amend Lots 13 & 14	0.88	1986	Sweetwater Sec 1 Village G 2	19.25	2012
Sunrise Terrace	2.05	1986	Ragan Subd	9.08	2012
Oak Shores on Lake Austin Sec 1	9.71	1986	Reserve at Lynnbrook	11.71	2012
Oak Shores on Lake Austin Sec 3	8.77	1986	West Cypress Hills Ph 1 Sec 4a Rev Lots 5,6,7,8,9 Blk C	5.56	2012
Long Canyon Ph 1A Am Lot 12 & 13	2.38	1986	Bart Cr Sec H, am 54 B Ph 2 & Lt 12 Blk G Est Ab Lost Cr	3.46	2012
River Pointe Subd	70.66	1986	Overlook Estates Ph 2	40.94	2012
Bokros Buffer Subd	3.93	1986	Rocky Creek Ranch Sec 2	66.45	2012
Oak Shores on Lake Austin Sec 2	4.00	1986	Spicehenge Subd.	22.06	2012
Lake Country Estates	21.59	1986	Amended Spanish Oaks Sec 3C Lot 35	0.79	2012
Wild Basin Point	12.25	1986	Sweetwater Sec. 1 Village H	14.33	2012
Fairway Oaks Resub Lots 1-11	7.77	1986	Sweetwater Sec 1 Village H2	3.97	2012
Caudill Addn	0.89	1986	Sweetwater Sec 2 Vilage F-1	11.36	2012
Hacienda Del Corazon	24.88	1987	Stoneridge Park	4.49	2012
Rob Roy Rim Condos	41.35	1987	Marbella Subd	117.26	2012
Crystal Creek Amend Lots 7, 9-11	8.26	1987	Sweetwater Sec 1 Village A Replat	9.64	2013
Baldwin Subd	5.99	1987	Belvedere Ph 3 Rev Lots 83 & 84	2.03	2013
Common Ford Commercial Park	7.63	1987	River Place Sec 9 Lot 1 Resub	15.29	2013
Eanes Ridge	9.32	1987	Sola Vista Sec 2	37.18	2013

A-3: Subdivision Developments in Travis County cont'd					
Name	**Acres**	**Year**	**Name**	**Acres**	**Year**
Loma Graciosa Subd West Lake Green Am Lots 5 & 6 Lot 2	15.56	1987	Belvedere Ph VI	41.69	2013
Flint Rock Hill Subd	10.33	1987	Spanish Oaks Sec 11	45.65	2013
Geisler Addn	6.13	1987	West Cypress Hills Ph 2 Sec 2	6.94	2013
Monte Verde Subd	10.82	1987	Montebella Sec 2	3.09	2013
Fox Creek	47.85	1987	West Cypress Hills Ph 1 Sec 4a Rev Lot 4 Blk C	0.20	2013
Lake Shore Addn Resub Pt Lots 20, 21	0.73	1987	Sola Vista Sec 3	35.79	2013
Tierra De Las Brisas	9.91	1988	Vistancia Sec 2	22.87	2013
Coldwater PUD Sec 2	77.18	1988	Vistancia Sec 3	10.07	2013
Circle Drive Subd	2.93	1988	Belvedere Ph VII A	15.51	2013
Lewis Mountain Ranch Ph 1	87.51	1988	Sweetwater Ranch Sec 2 Village F2	10.51	2013
Westlake Hills Presbyterian Church	35.54	1988	Bella Colinas Sec 1	32.33	2013
Wild Basin Subd	2.38	1988	Agroland	4.75	2014
SUBTOTAL ACRES	20,230		Preserve at Thomas Springs Road	28.32	2014
			SUBTOTAL ACRES	20,298	
			TOTAL ACRES	**40,528**	

Note: This list does not include subdivisions for which a development year was unavailable from Travis County Transportation and Natural Resources Department.

Attachment B
Transportation, Land Use and Other Planning Maps from Various Jurisdictions

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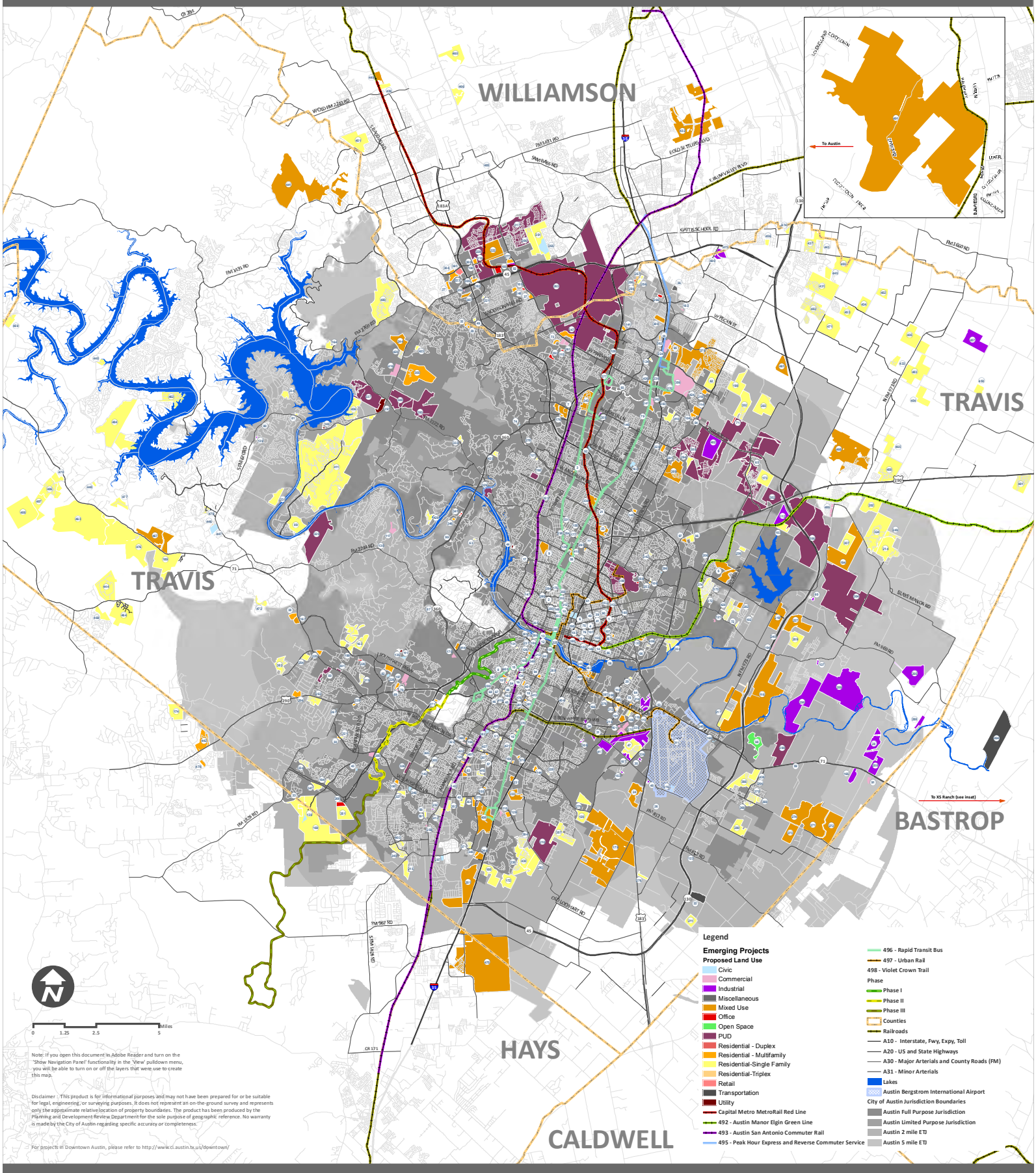
Prominent development projects in planning or construction phases in and around Austin.



Note: If you open this document in Adobe Reader and turn on the "Show Navigation Panel" functionality in the 'View' pulldown menu, you will be able to turn on or off the layers that were use to create this map.

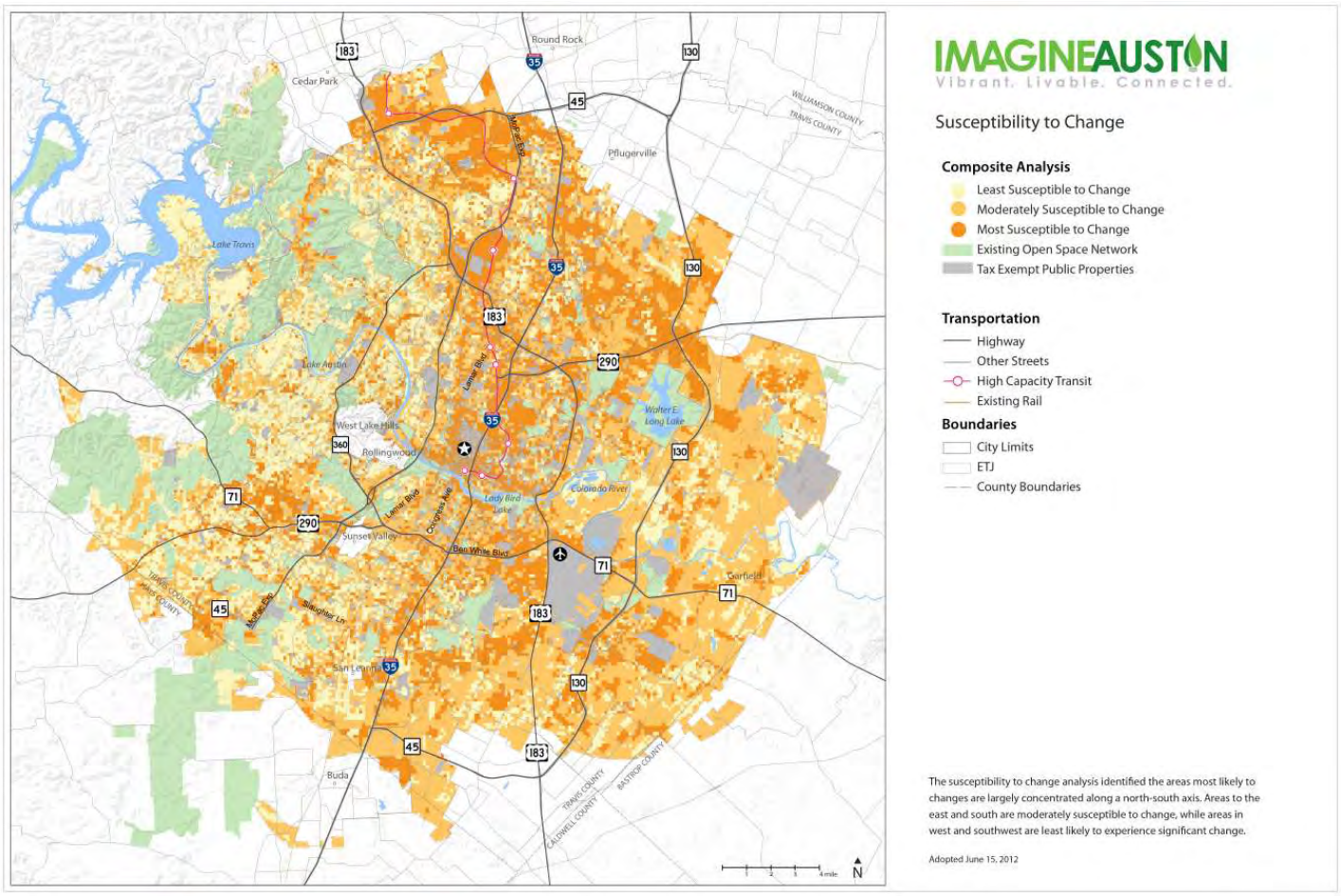
Disclaimer : This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. The product has been produced by the Planning and Development Review Department for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.

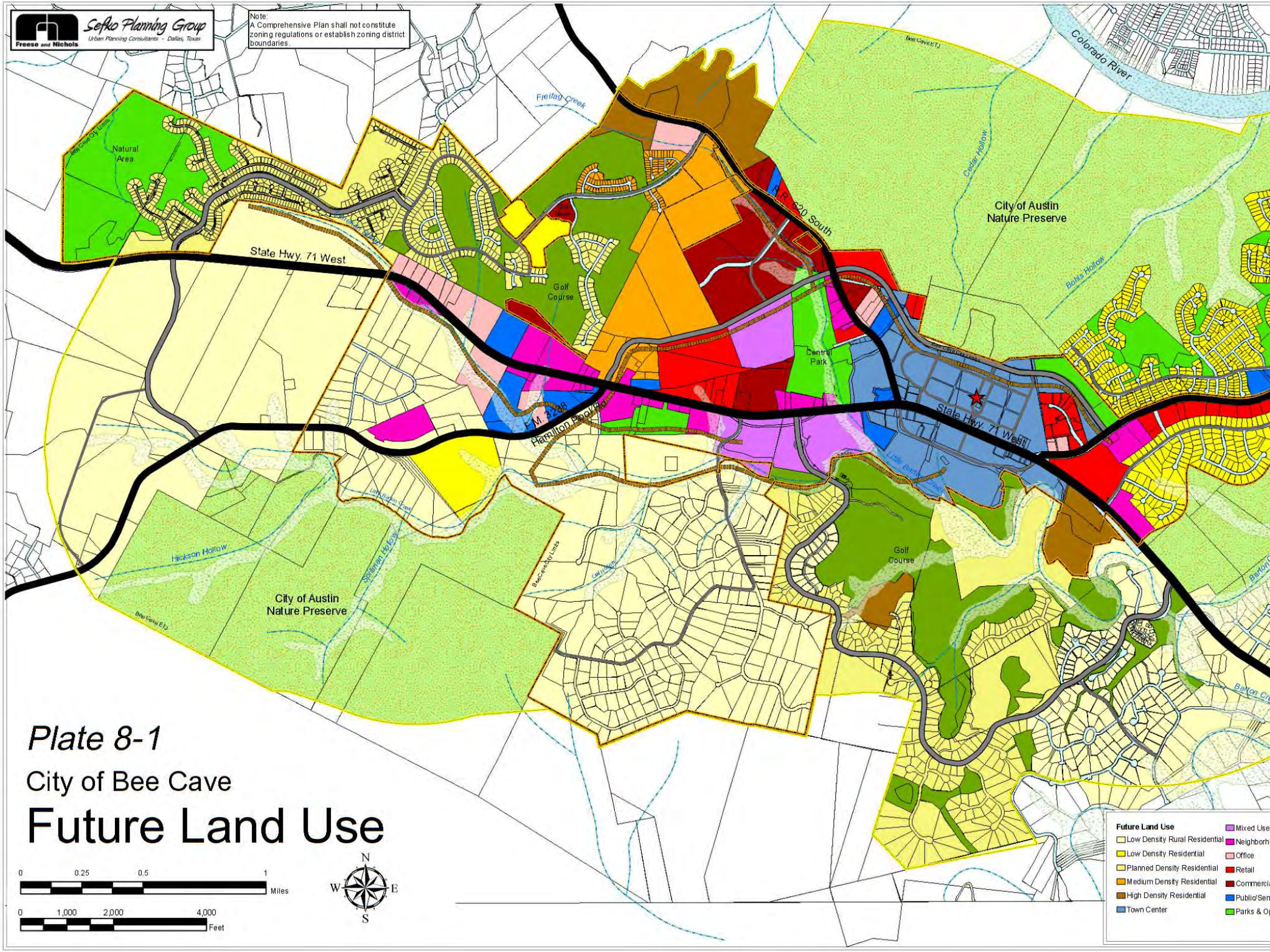
For projects in Downtown Austin, please refer to http://www.ci.austin.tx.us/downtown/

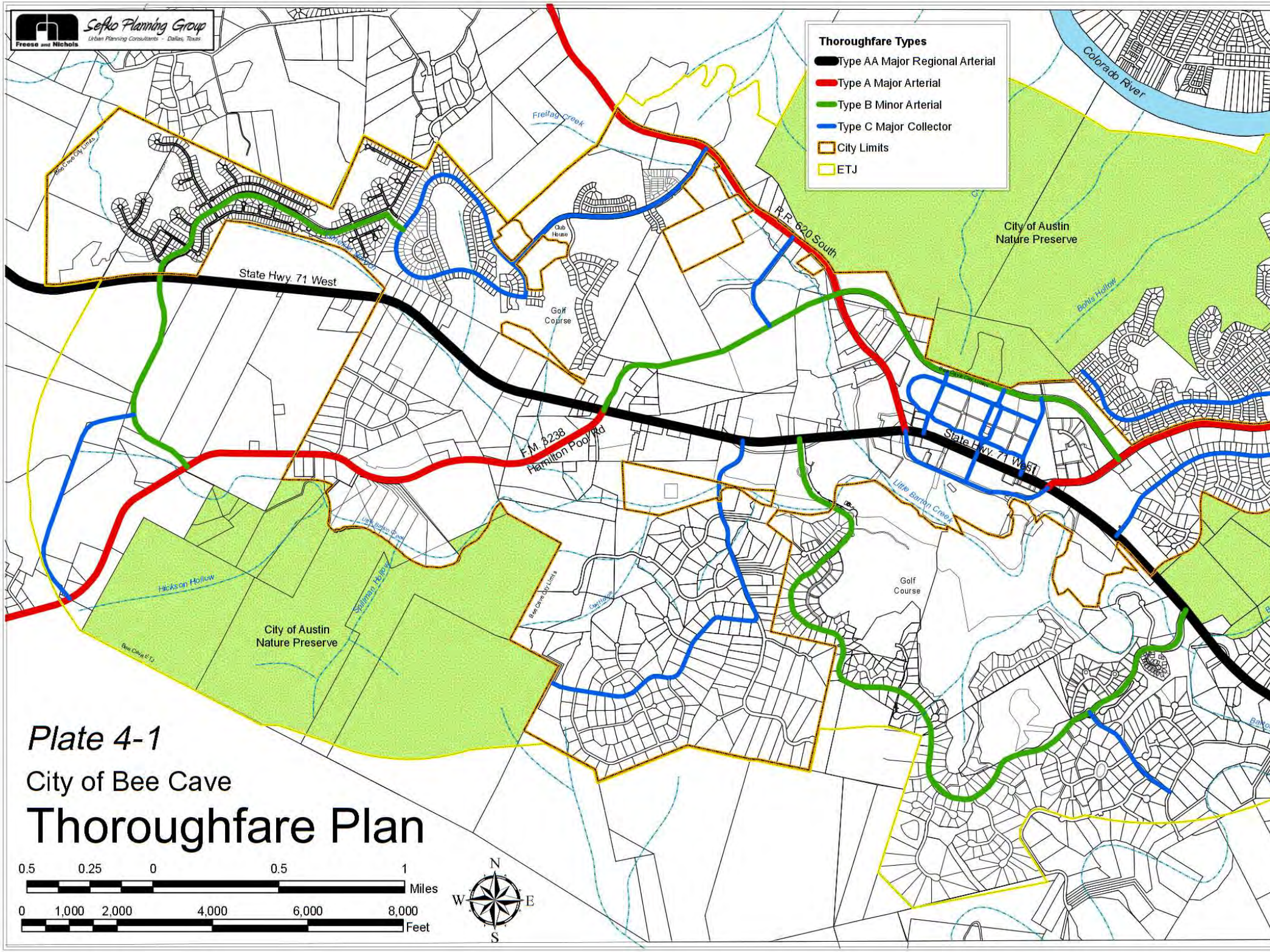
Emerging Projects

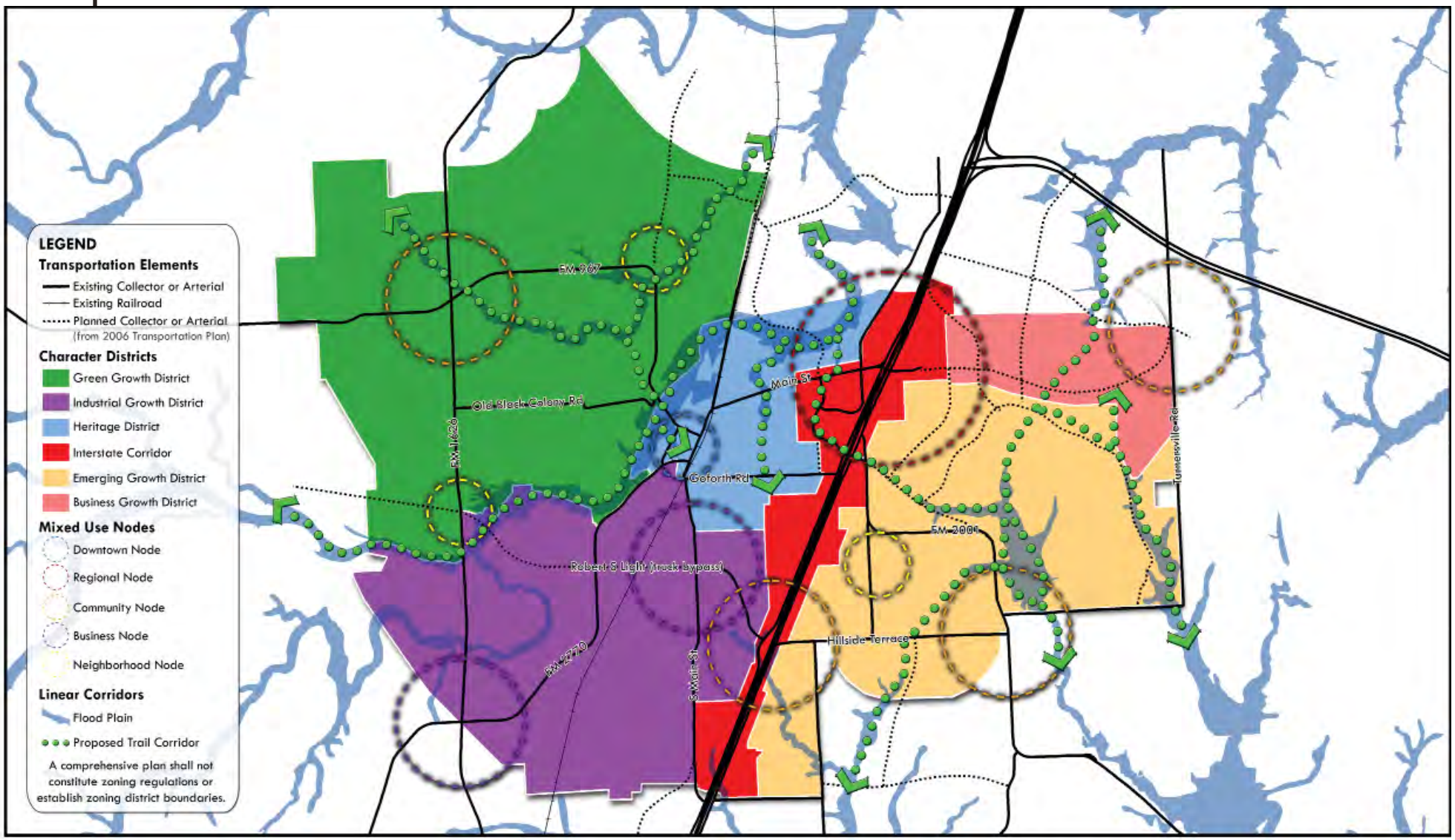
GIS Data Sources : City of Austin, Travis County, Bastrop Central Appraisal District, Travis Central Appraisal District.
Data Source: Media sources like newspapers, websites as well as site and subdivision permits.

Produced by the Planning and Development Review Department, City of Austin, November 2013.
If you have questions or comments about Emerging Projects, Austin 2013, please contact Surbhi Bakshi at Surbhi.Bakshi@austintexas.gov or at (512) 974-6458.


IMAGINEAUSTIN
Vibrant. Livable. Connected.
Susceptibility to Change
Composite Analysis
Least Susceptible to Change
Moderately Susceptible to Change
Most Susceptible to Change
Existing Open Space Network
Tax Exempt Public Properties
Transportation
Highway
Other Streets
High Capacity Transit
Existing Rail
Boundaries
City Limits
ETJ
County Boundaries
The susceptibility to change analysis identified the areas most likely to changes are largely concentrated along a north-south axis. Areas to the east and south are moderately susceptible to change, while areas in west and southwest are least likely to experience significant change.
Adopted June 15, 2012
Round Rock
Cedar Park
Pflugerville
Lake Travis
Lake Austin
West Lake Hills
Rollingwood
Sunset Valley
Lady Bird Lake
Colorado River
Walter E. Long Lake
Bee White Blvd
Garfield
San Leanna
Buda
Lamar Blvd
Mopac Exp
Slaughter Ln
Decker Ln
WILLIAMSON COUNTY
TRAVIS COUNTY
HAYS COUNTY
CALDWELL COUNTY
BASTROP COUNTY
183
130
45
35
290
71
360
N


Sefko Planning Group
Urban Planning Consultants - Dallas, Texas
Freese and Nichols
Note:
A Comprehensive Plan shall not constitute zoning regulations or establish zoning district boundaries.
Colorado River
Bee Cave ETJ
Freitag Creek
Natural Area
Bee Cave City Limits
State Hwy. 71 West
Golf Course
F.M. 3238
Hamilton Pool Rd.
R.R. 620 South
City of Austin Nature Preserve
Cedar Hollow
Burks Hollow
Central Park
Little Barton Creek
Hickson Hollow
Spillman Hollow
Barton Creek
Plate 8-1
City of Bee Cave
Future Land Use
0 0.25 0.5 1 Miles
0 1,000 2,000 4,000 Feet
N
W E
S
Future Land Use
Low Density Rural Residential
Low Density Residential
Planned Density Residential
Medium Density Residential
High Density Residential
Town Center
Mixed Use
Office
Retail
Parks & Op


Sefko Planning Group
Urban Planning Consultants - Dallas, Texas
Freese and Nichols
Thoroughfare Types
Type AA Major Regional Arterial
Type A Major Arterial
Type B Minor Arterial
Type C Major Collector
City Limits
ETJ
Colorado River
Freitag Creek
R.R. 620 South
City of Austin
Nature Preserve
Bohls Hollow
State Hwy. 71 West
Club House
Golf Course
F.M. 3238
Hamilton Pool Rd
Little Barton Creek
Hicks on Hollow
Spillman Hollow
Bee Cave City Limits
Bee Cave ETJ
Golf Course
Plate 4-1
City of Bee Cave
Thoroughfare Plan
0.5 0.25 0 0.5 1
Miles
0 1,000 2,000 4,000 6,000 8,000
Feet
N
W
E
S



Buda Future Land Development Plan

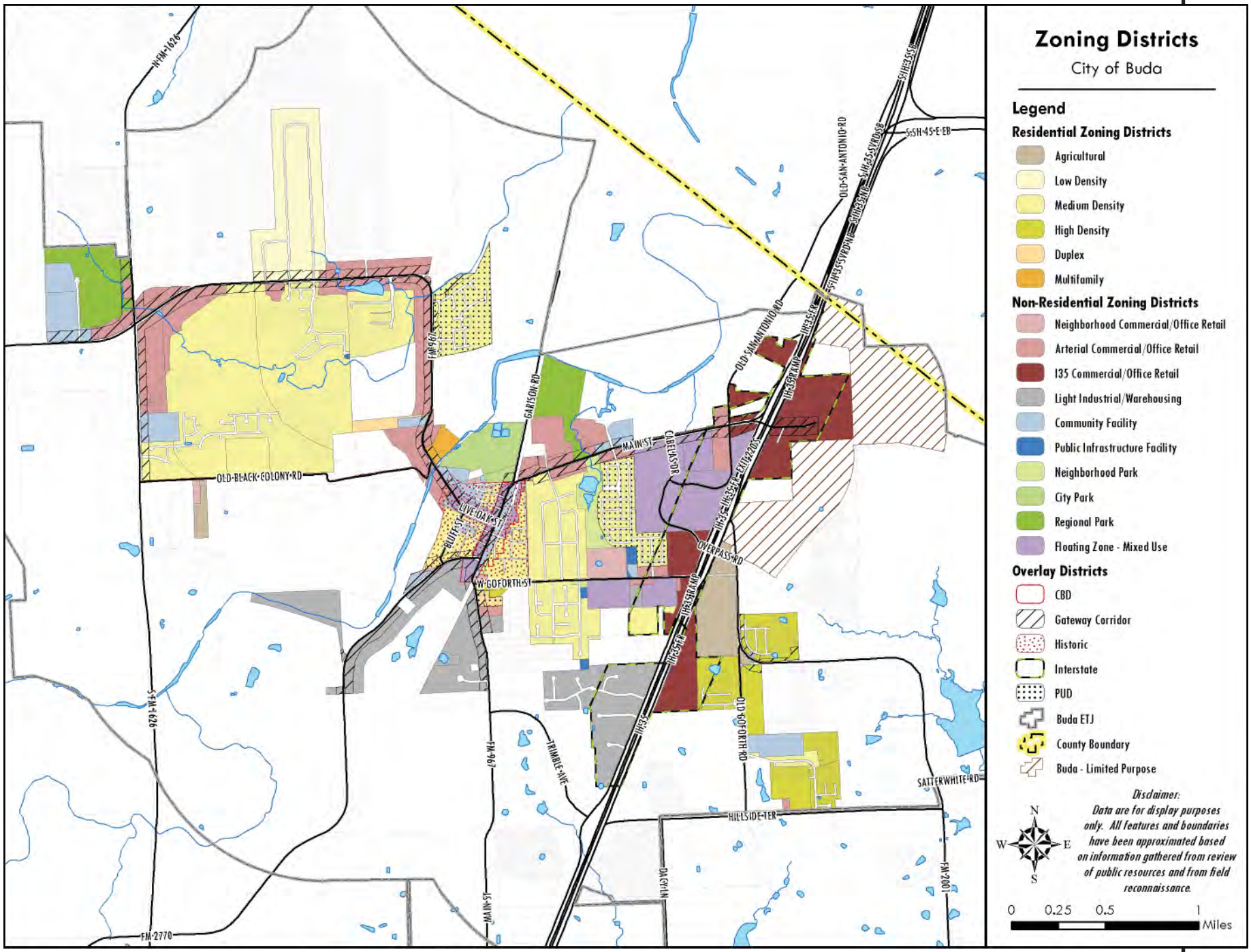
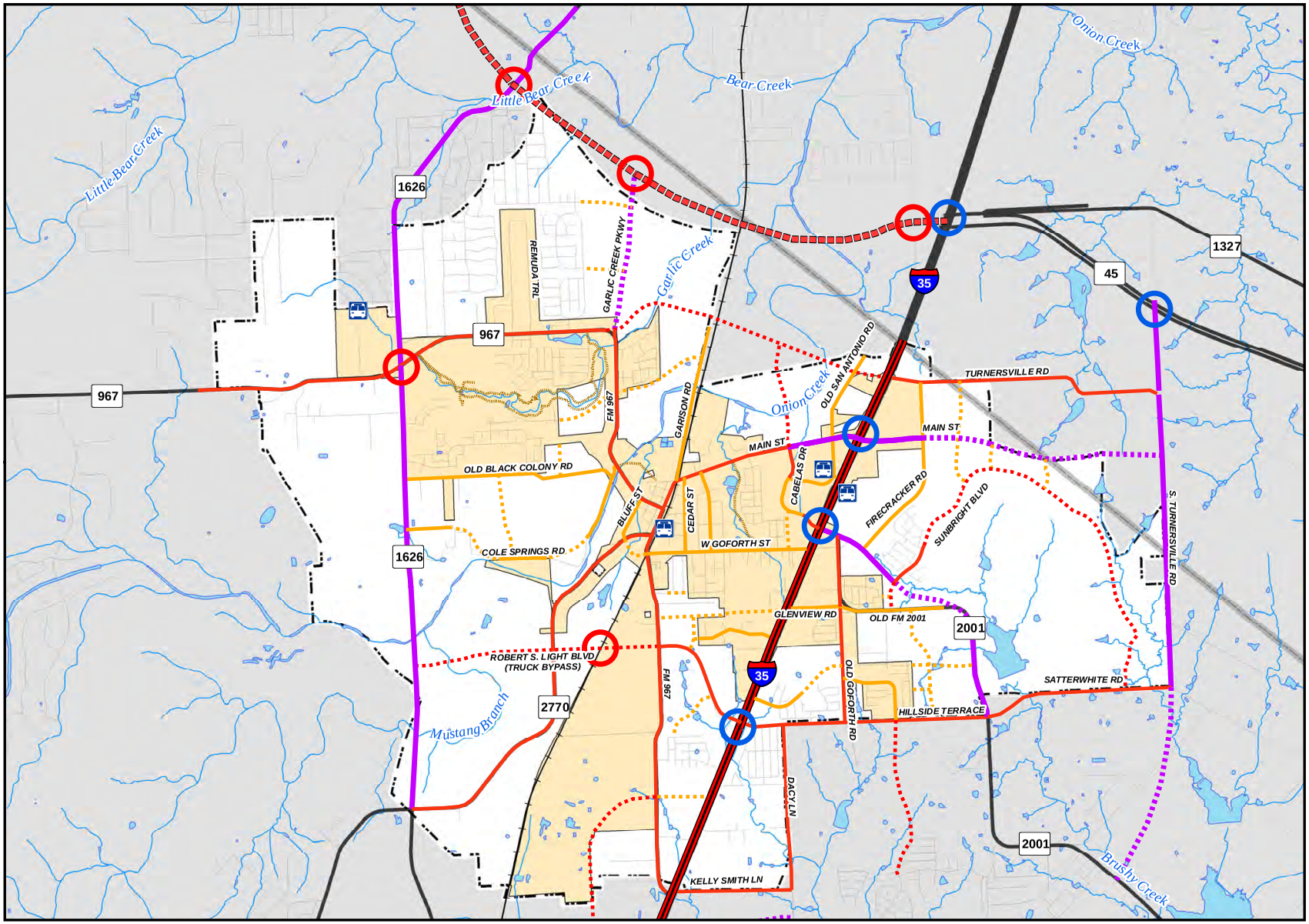

Zoning Districts
City of Buda
Legend
Residential Zoning Districts
Agricultural
Low Density
Medium Density
High Density
Duplex
Multifamily
Non-Residential Zoning Districts
Neighborhood Commercial/Office Retail
Arterial Commercial/Office Retail
I35 Commercial/Office Retail
Light Industrial/Warehousing
Community Facility
Public Infrastructure Facility
Neighborhood Park
City Park
Regional Park
Floating Zone - Mixed Use
Overlay Districts
CBD
Gateway Corridor
Historic
Interstate
PUD
Buda ETJ
County Boundary
Buda - Limited Purpose
Disclaimer:
Data are for display purposes only. All features and boundaries have been approximated based on information gathered from review of public resources and from field reconnaissance.
N
W
E
S
0
0.25
0.5
1
Miles
N-FM-1626
S-FM-1626
FM-967
GARISON RD
OLD-BLACK-COLONY-RD
MAIN-ST
CABELAS-DR
LIVE-OAK-ST
BLUFF-ST
W-GOFORTH-ST
OVERPASS-RD
OLD-SAN-ANTONIO-RD
S-SH-45-E-EB
TRIMBLE-AVE
OLD-GOFORTH-RD
SATTERWHITE-RD
HILLSIDE-TER
DACY-LN
FM-2001
FM-2770

EXHIBIT 3 - Transportation Master Plan



Grade Separations

- Exist. Overpass
- New Overpass

Roadway Network Classification

	ROW*
New Highway	
Highway	
New Parkway	120'
Parkway	120'
New Arterial	(70'-110')
Arterial	(70'-110')
New Collector	(60'-90')
Collector	(60'-90')

*ROW varies based on typical section. Please refer to the Major Roadway Planning Guide for ROW widths of individual segments.

8' Off-Street Trail*

On-street Pedestrian and Bicycle Facilites shown in Exhibits 2a & 2b.

Potential Park and Ride

Legend

- Railroad
- River/Creek
- Lake/Pond/Reservoir
- County Boundary
- Buda City Limit
- Buda ETJ

N

CITY OF BUDA

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

CAMPO

Enter an Address with City and State... Search

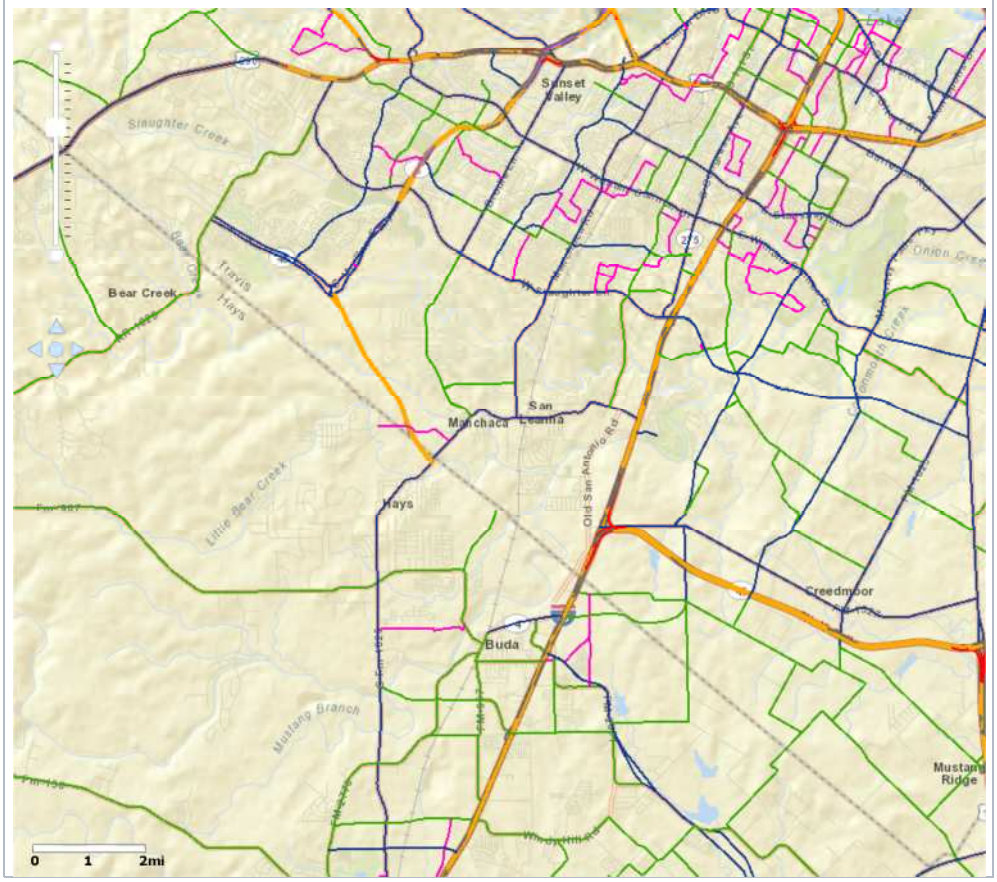
Clear Graphics Layer Information Help Disclaimer

CAMPO Interactive Map

Table of Contents

Layers Searches

- Planning
- Bicycle/Pedestrian Infrastructure
- Crashes
- Performance of Road Systems
- Traffic Counts
- Transportation Infrastructure
  - Improved Roadways
  - 2010 Roadways
  - 2035 Roadways
  - 2010 Transit Routes
  - 2035 Transit Routes
  - Deficient Bridges
- Environmental
- Political/Service Boundaries
- Streets, Aerials and Topos



Legend

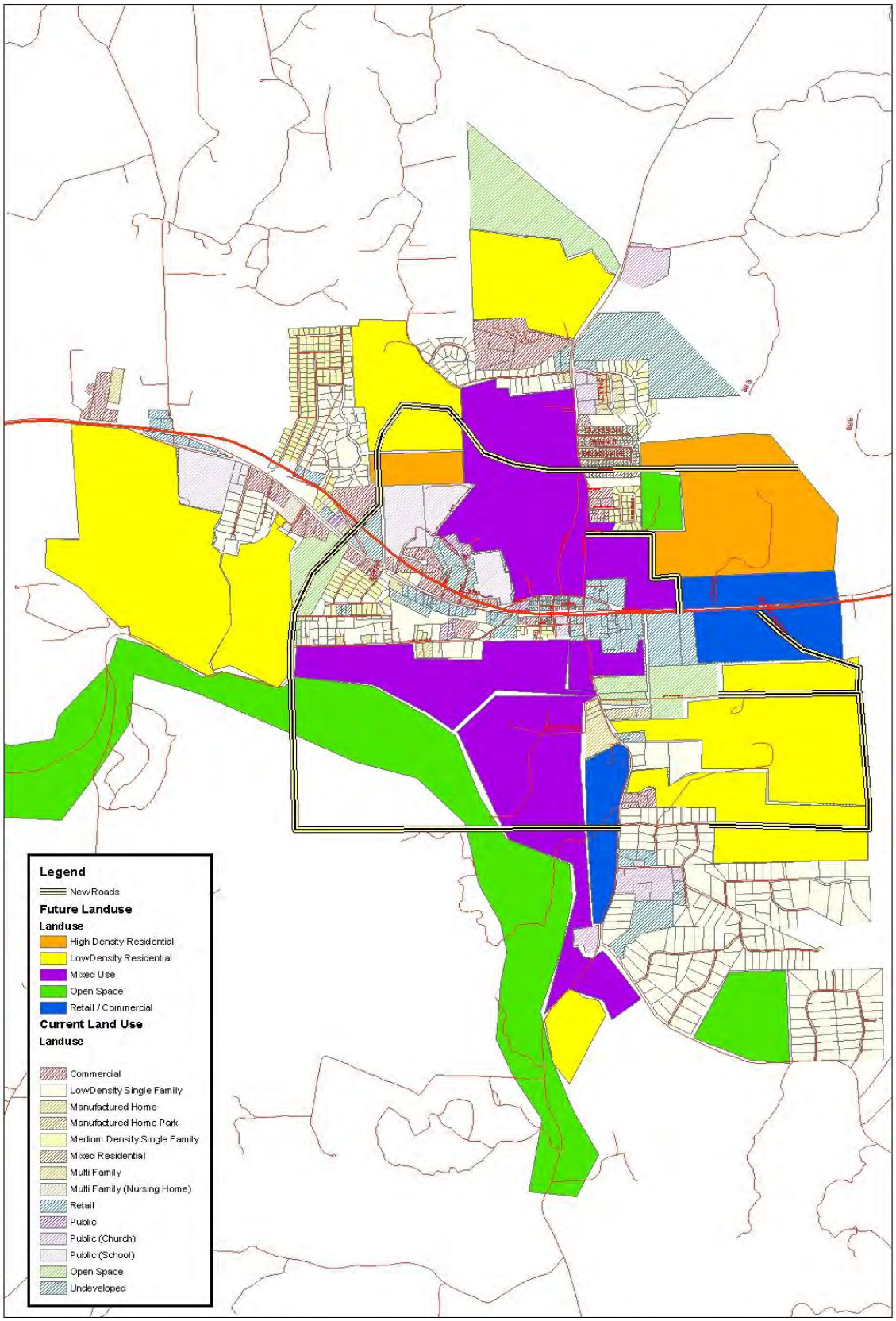
Transportation Infrastructure

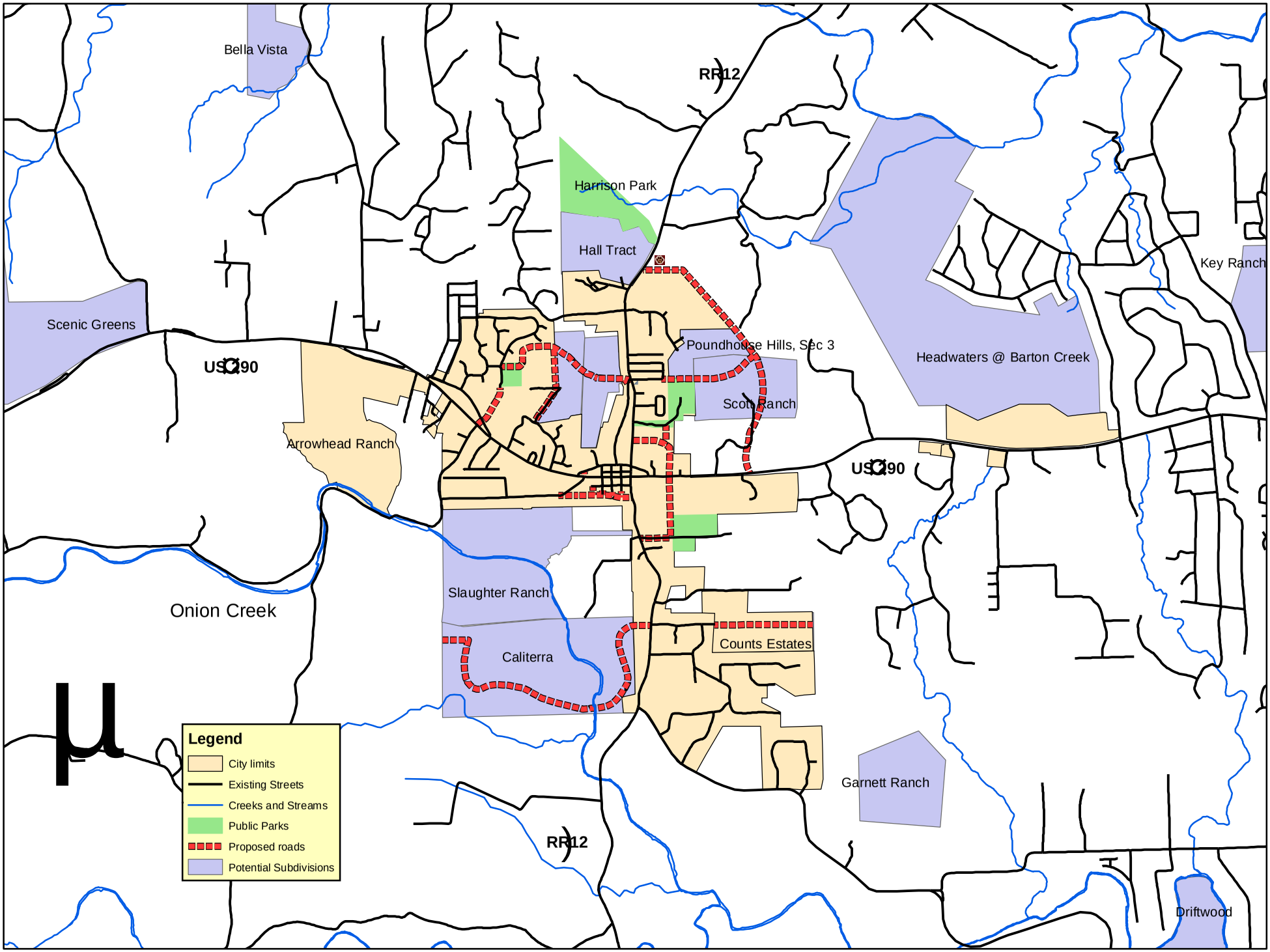
2035 Roadways

- Managed Lanes
- Major Arterial
- Minor Arterial
- Frontage Road/Ramp
- Collector/Local
- Highway
- Express Lane

CAMPO Service Area

Proposed Future Land Use Map





City of Dripping Springs
Transportation Plan (February 12, 2008)

DISCLAIMER:
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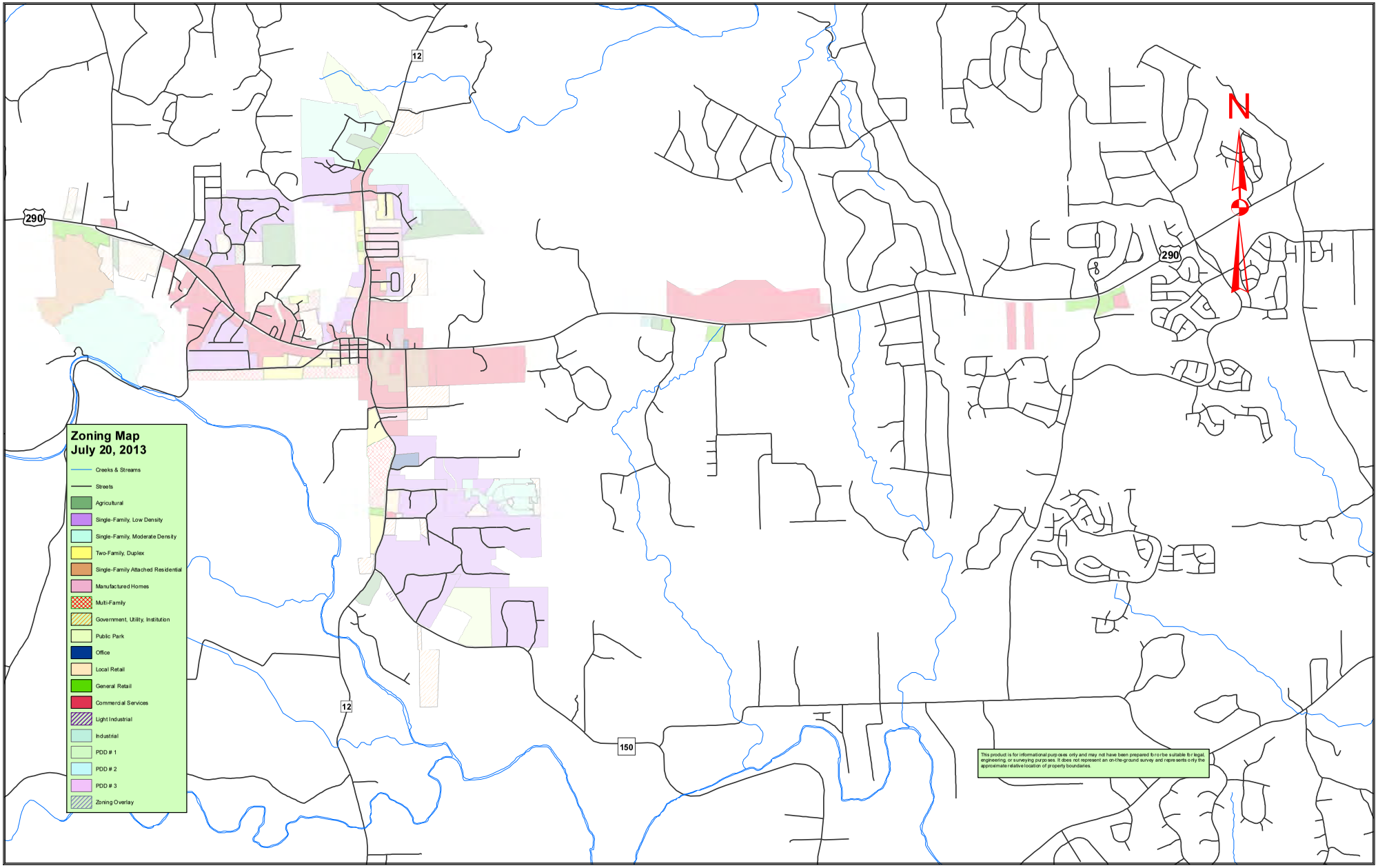
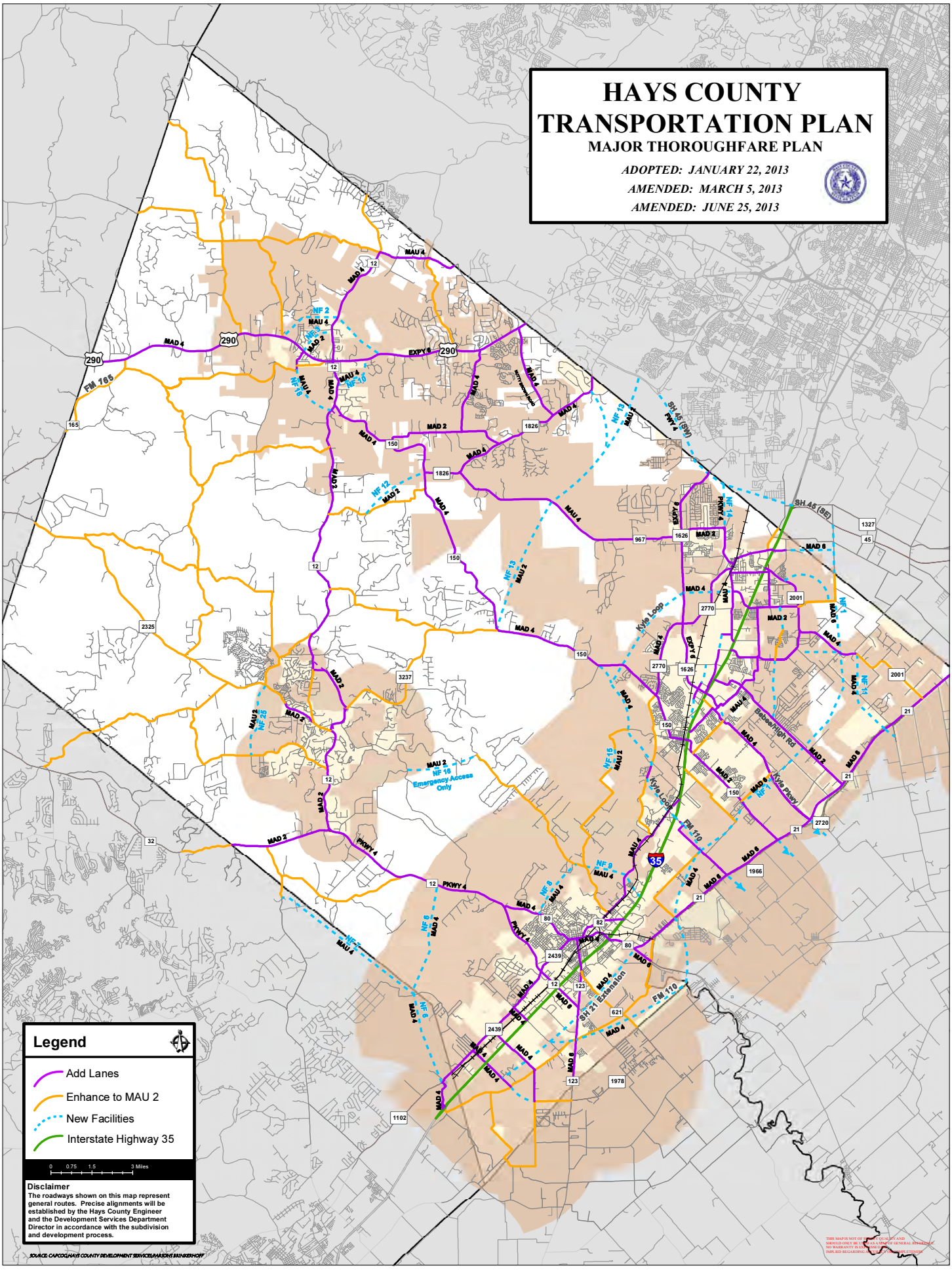
Hays County assumes no liability for misinterpretation or misuse of any data represented in any format. No warranty is expressed or implied regarding accuracy or completeness.


Zoning Map
July 20, 2013
Creeks & Streams
Streets
Agricultural
Single-Family, Low Density
Single-Family, Moderate Density
Two-Family, Duplex
Single-Family Attached Residential
Manufactured Homes
Multi-Family
Government, Utility, Institution
Public Park
Office
Local Retail
General Retail
Commercial Services
Light Industrial
Industrial
PDD # 1
PDD # 2
PDD # 3
Zoning Overlay
N
290
12
150
This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.


HAYS COUNTY
TRANSPORTATION PLAN
MAJOR THOROUGHFARE PLAN
ADOPTED: JANUARY 22, 2013
AMENDED: MARCH 5, 2013
AMENDED: JUNE 25, 2013
Legend
Add Lanes
Enhance to MAU 2
New Facilities
Interstate Highway 35
0 0.75 1.5 3 Miles
Disclaimer
The roadways shown on this map represent general routes. Precise alignments will be established by the Hays County Engineer and the Development Services Department Director in accordance with the subdivision and development process.
SOURCE: CAPCOG,HAYS COUNTY DEVELOPMENT SERVICES,PARSONS BRINKERHOFF
Kyle Loop
Kyle Pkwy
Bebee/High Rd
SH 45 (SW)
SH 45 (SE)
SH 21 Extension
FM 165
FM 110
Emergency Access Only
NF 16
NF 2
NF 10
NF 12
NF 13
NF 14
NF 15
NF 25
NF 9
NF 8
NF 6
NF 7
NF 1
NF 11
MAD 4
MAD 2
MAD 6
MAU 4
MAU 2
EXPY 6
PKWY 4
PWY 4
290
35

The Districts of the Future Land Use Plan

Each district of the Future Land Use Plan was created to manifest land use in a consistent, yet unique manner, fostering a clearly recognizable sense of place. This sense of place in turn reinforces the meaning, and therefore community, established within the various areas of the City of Kyle.

The land use districts of the Future Land Use Plan are grouped into three general categories. These categories articulate the primary determinant of the nature of each district. This determinant guides and directs decisions made regarding form, function, boundaries, density, and acceptable uses within the given district. The districts of the Future Land Use Plan are categorized as:

- Landscapes preserve and promote environment
- Communities preserve and promote neighborhoods
- Nodes preserve and promote commercial development

Future Land Use Plan Map Graphic

Figure 2 displays the 15 land use districts designed for Kyle, as well as the two corridor conditions. Each one of the Landscapes, Communities, and Nodes will be described in greater detail on the following pages. The Corridor Conditions are conceptually illustrated on the Land Use Plan graphic in Figure 2 as a series of hatched areas, marking land that directly interfaces with key roadways, including existing roadways and those identified by the Thoroughfare Plan element of this Comprehensive Plan document.

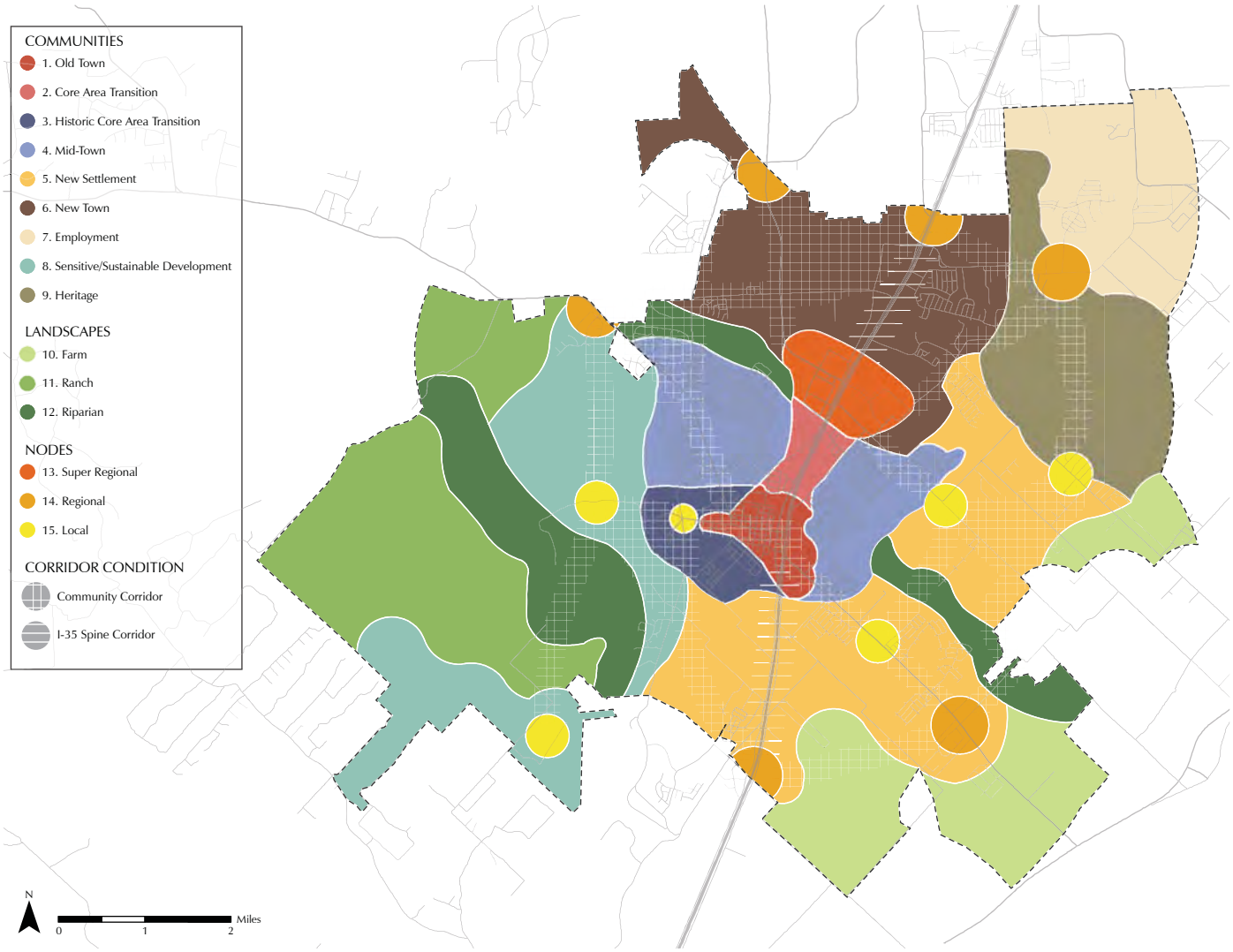


Figure 2: Kyle Future Land Use Plan.

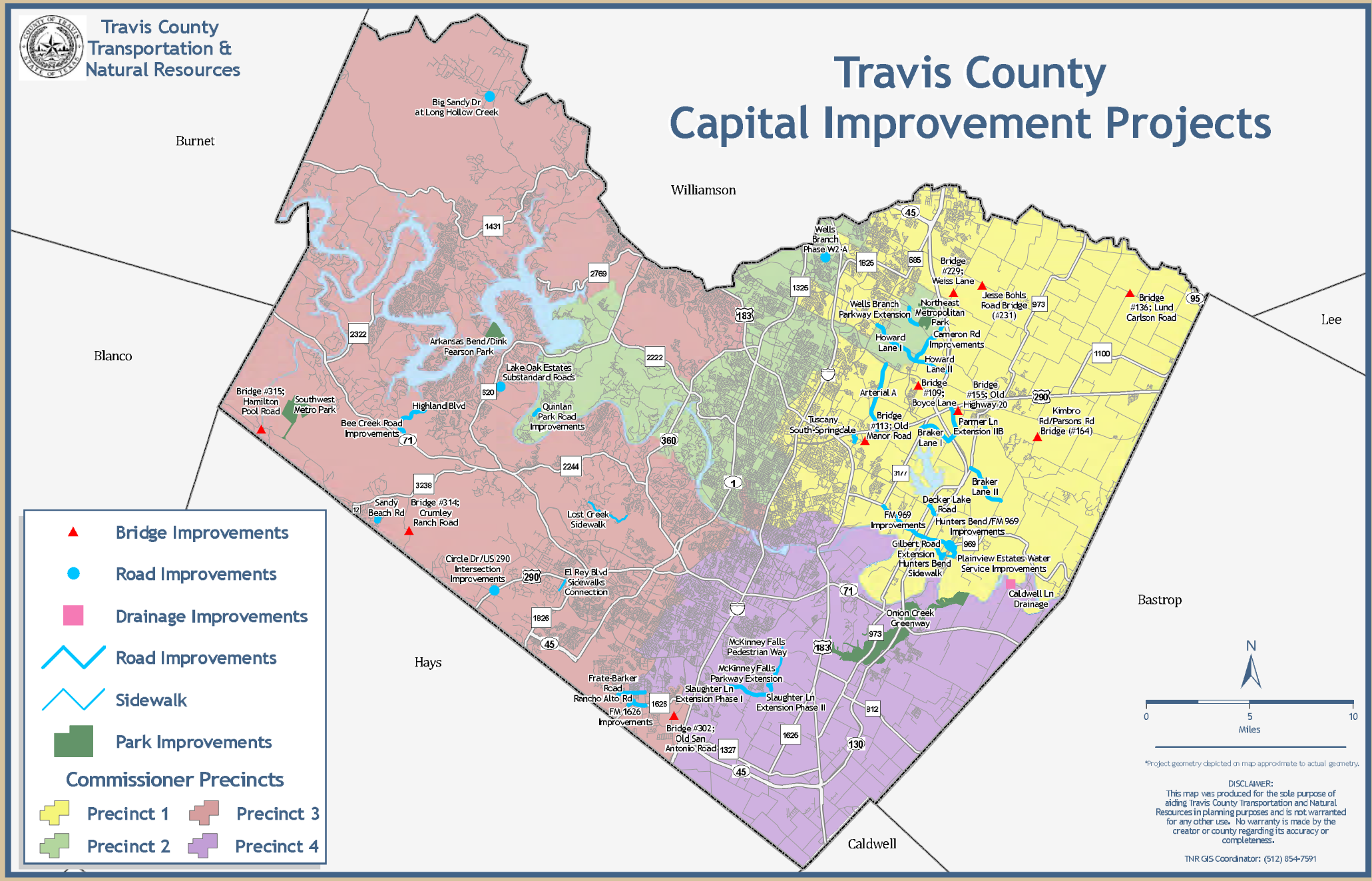
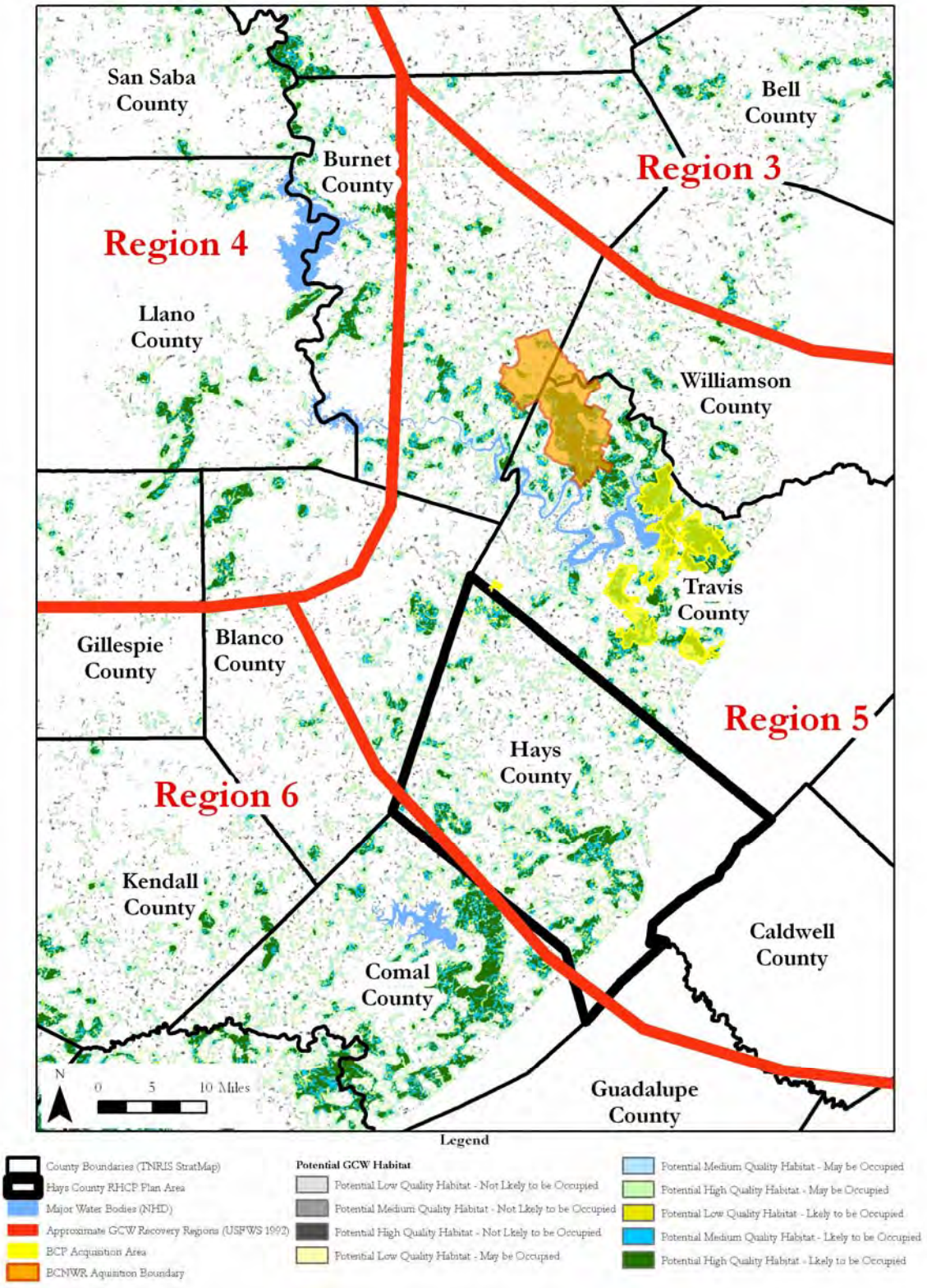
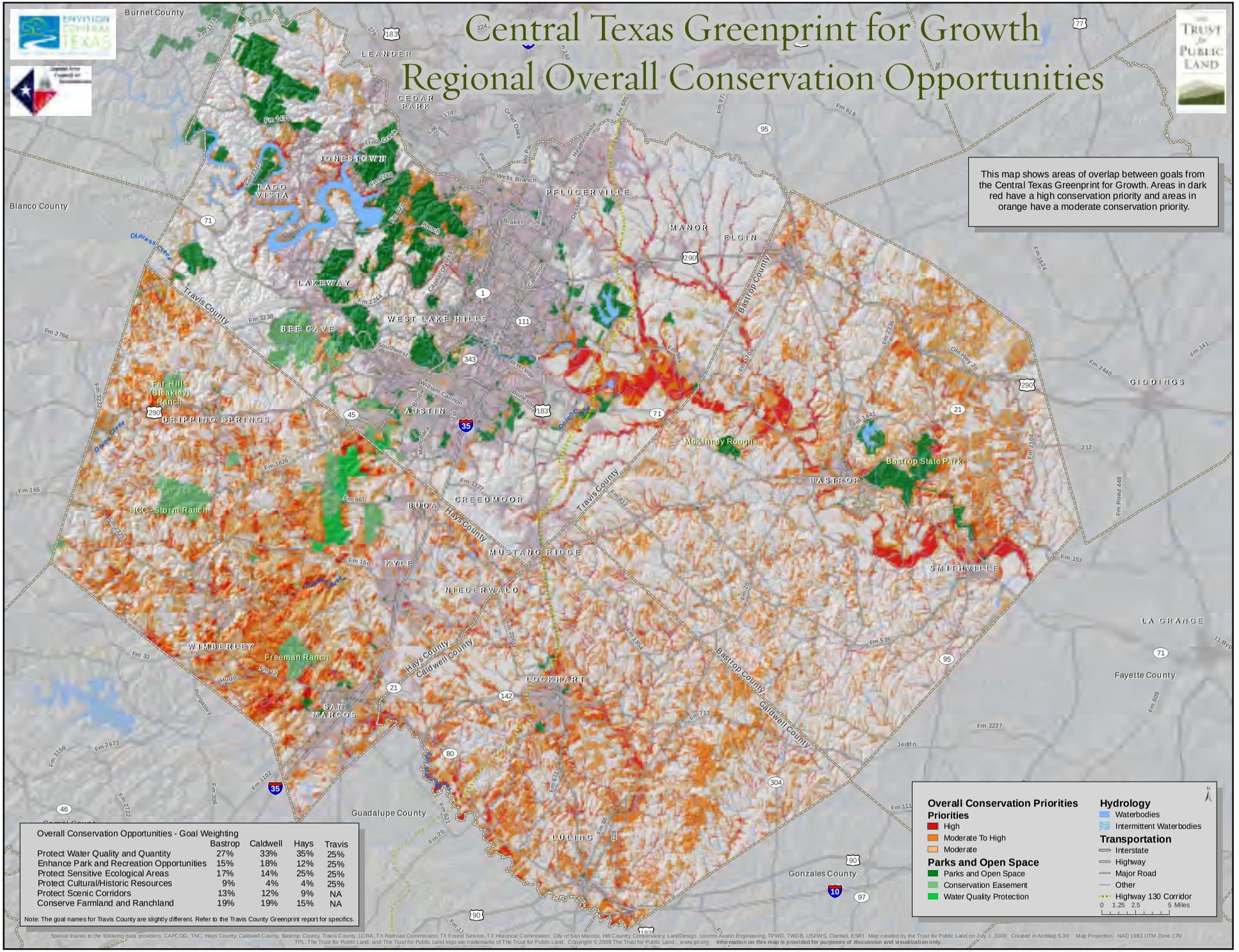

Travis County
Transportation &
Natural Resources
Travis County
Capital Improvement Projects
Burnet
Williamson
Lee
Blanco
Hays
Bastrop
Caldwell
Big Sandy Dr at Long Hollow Creek
Wells Branch Phase W2-A
Bridge #229; Weiss Lane
Jesse Bohls Road Bridge (#231)
Bridge #136; Lund Carlson Road
Wells Branch Parkway Extension
Northeast Metropolitan Park
Cameron Rd Improvements
Howard Lane I
Howard Lane II
Arkansas Bend/Dink Fearson Park
Lake Oak Estates Substandard Roads
Bridge #315; Hamilton Pool Road
Southwest Metro Park
Highland Blvd
Bee Creek Road Improvements
Quintan Park Road Improvements
Arterial A
Bridge #109; Boyce Lane
Bridge #155; Old Highway 20
Kimbro Rd/Parsons Rd Bridge (#164)
Tuscany South-Springdale
Bridge #113; Old Manor Road
Braker Lane I
Parmer Ln Extension IIB
Braker Lane II
Decker Lake Road
FM 969 Improvements
Hunters Bend/FM 969 Improvements
Gilbert Road Extension
Hunters Bend Sidewalk
Plainview Estates Water Service Improvements
Caldwell Ln Drainage
Onion Creek Greenway
Bridge #314; Crumley Ranch Road
Sandy Beach Rd
Lost Creek Sidewalk
Circle Dr/US 290 Intersection Improvements
El Rey Blvd Sidewalks Connection
McKinney Falls Pedestrian Way
McKinney Falls Parkway Extension
Slaughter Ln Extension Phase I
Slaughter Ln Extension Phase II
Frate-Barker Road
Rancho Alto Rd
FM 1626 Improvements
Bridge #302; Old San Antonio Road
Bridge Improvements
Road Improvements
Drainage Improvements
Road Improvements
Sidewalk
Park Improvements
Commissioner Precincts
Precinct 1
Precinct 2
Precinct 3
Precinct 4
N
0
5
10
Miles
*Project geometry depicted on map approximate to actual geometry.
DISCLAIMER:
This map was produced for the sole purpose of aiding Travis County Transportation and Natural Resources in planning purposes and is not warranted for any other use. No warranty is made by the creator or county regarding its accuracy or completeness.
TNR GIS Coordinator: (512) 854-7591

Figure 3-3. Golden-cheeked Warbler Focal Area Preserves in Recovery Region 5.



Central Texas Greenprint for Growth
Regional Overall Conservation Opportunities



Overall Conservation Opportunities - Goal Weighting

	Bastrop	Caldwell	Hays	Travis
Protect Water Quality and Quantity	27%	33%	35%	25%
Enhance Park and Recreation Opportunities	15%	18%	12%	25%
Protect Sensitive Ecological Areas	17%	14%	25%	25%
Protect Cultural/Historic Resources	9%	4%	4%	25%
Protect Scenic Corridors	13%	12%	9%	NA
Conserve Farmland and Ranchland	19%	19%	15%	NA

Note: The goal names for Travis County are slightly different. Refer to the Travis County Greenprint report for specifics.

Special thanks to the following data providers: CAPCOG, TNC, Hays County, Caldwell County, Bastrop County, Travis County, LCRA, TX Railroad Commission, TX Forest Service, TX Historical Commission, City of San Marcos, Hill Country Conservancy, LandDesign, Looms Austin Engineering, TPWD, TWDB, USFWS, Claritas, ESRI Map created by the Trust for Public Land on July 1, 2009 Created in ArcMap 9.3® Map Projection: NAD 1983 UTM Zone 17N
TPL, The Trust for Public Land, and The Trust for Public Land logo are trademarks of The Trust for Public Land. Copyright © 2009 The Trust for Public Land. www.tpl.org Information on this map is provided for purposes of discussion and visualization only.

Attachment C
Impervious Cover Figures

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Figure C-1: Aquifer Zones and Impervious Cover (1970) within the Groundwater RSA

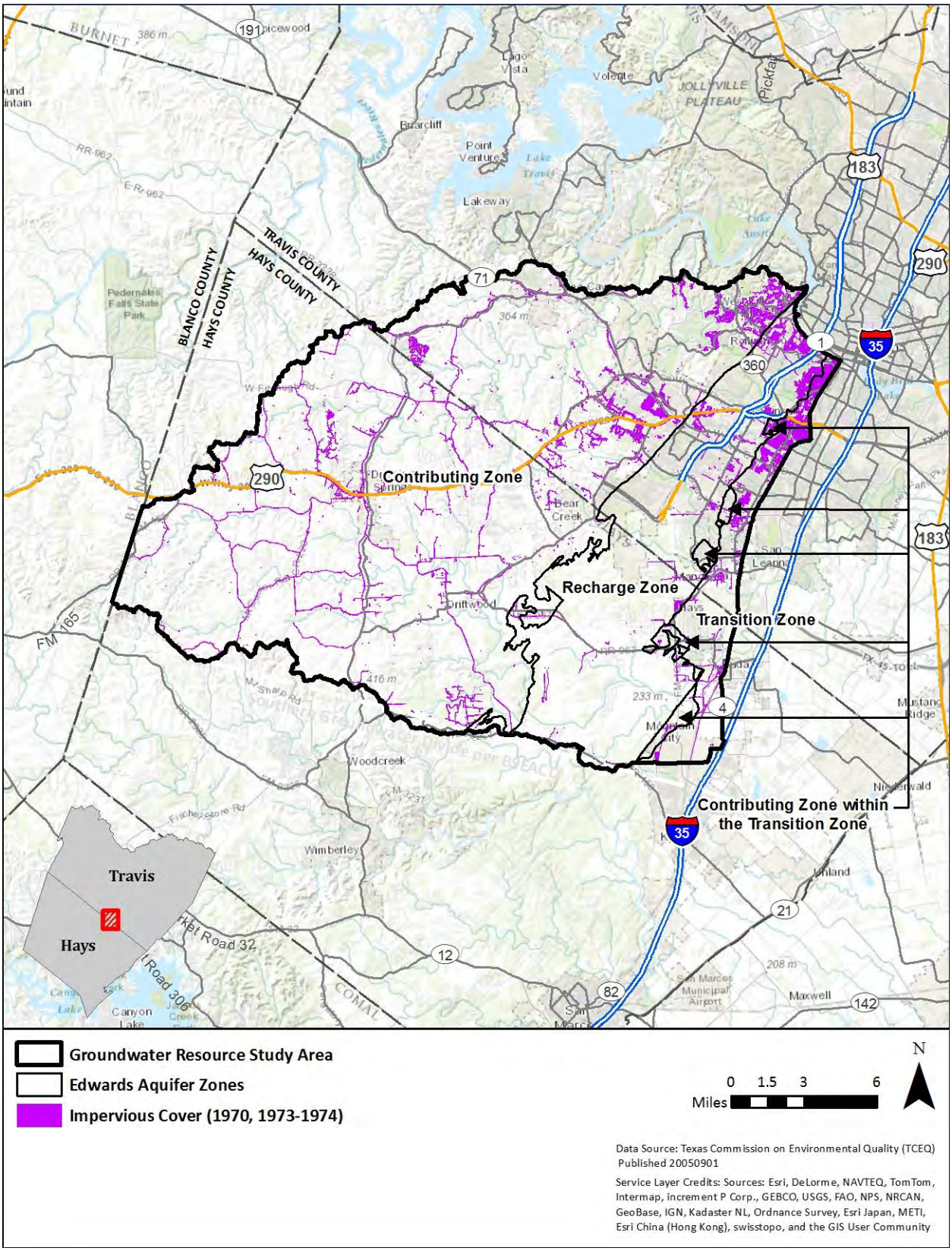

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Figure C-2: Watersheds and Impervious Cover (1970) within the Groundwater RSA

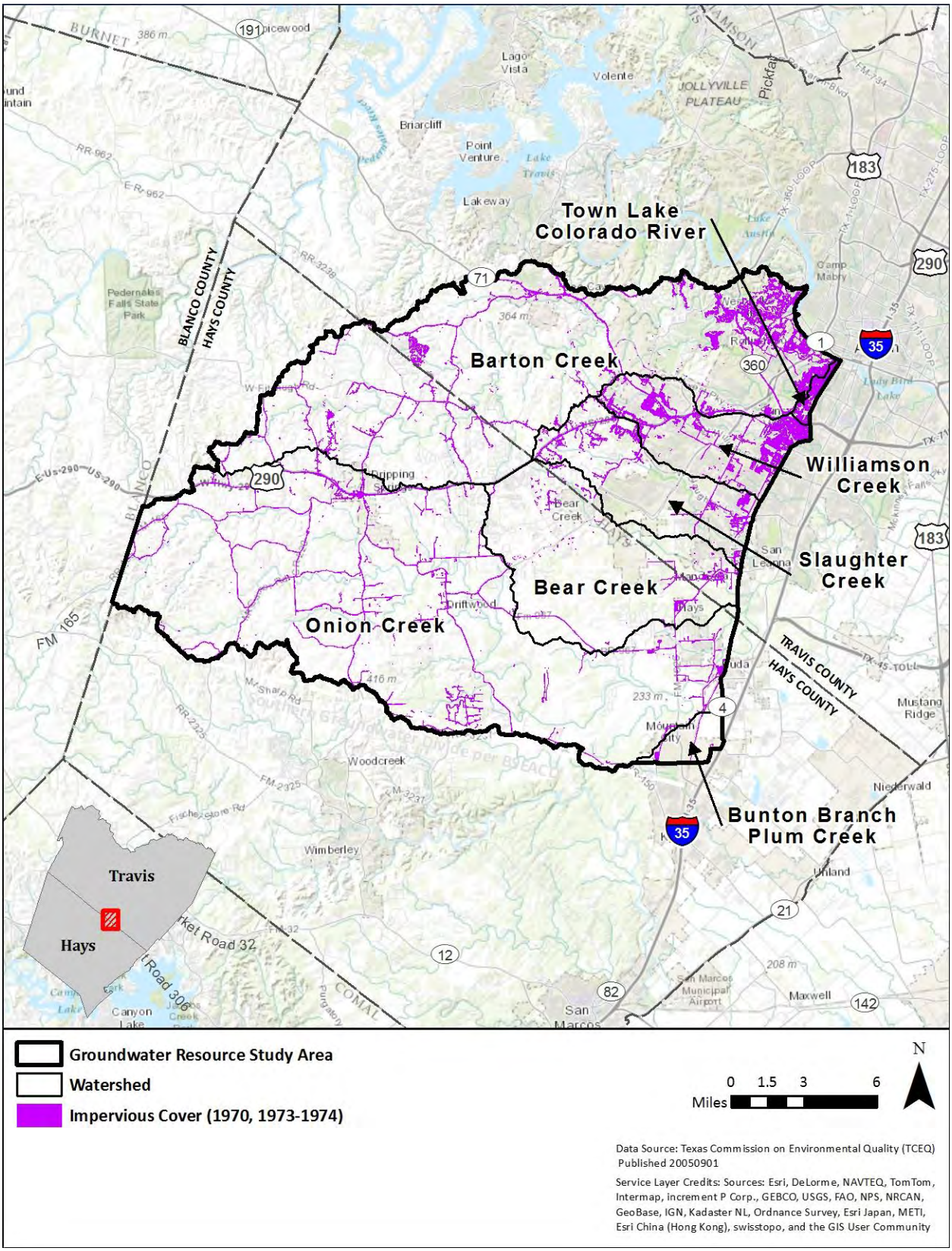

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Figure C-3: Aquifer Zones and Impervious Cover (1990) within the Groundwater RSA

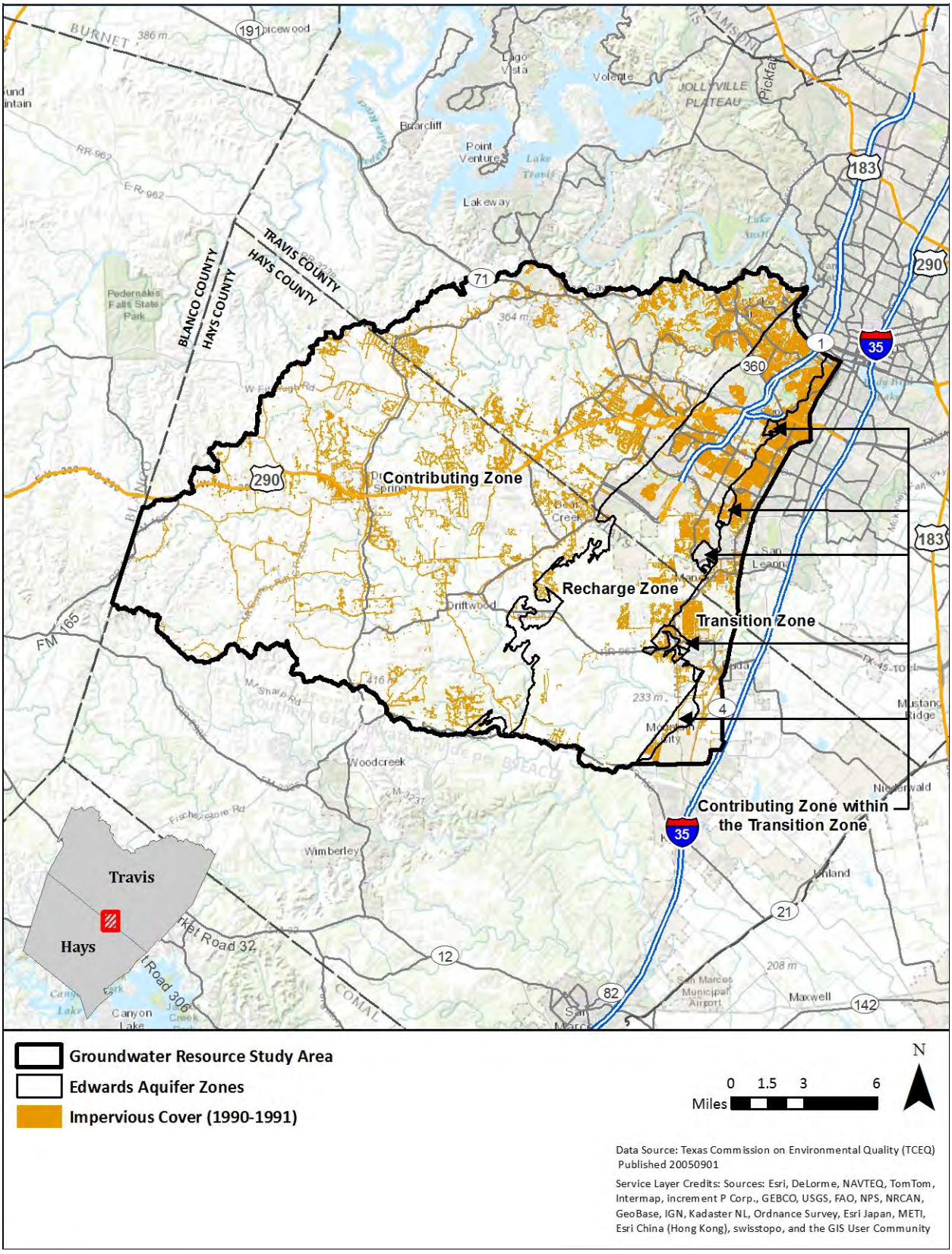

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Figure C-4: Watersheds and Impervious Cover (1990) within the Groundwater RSA

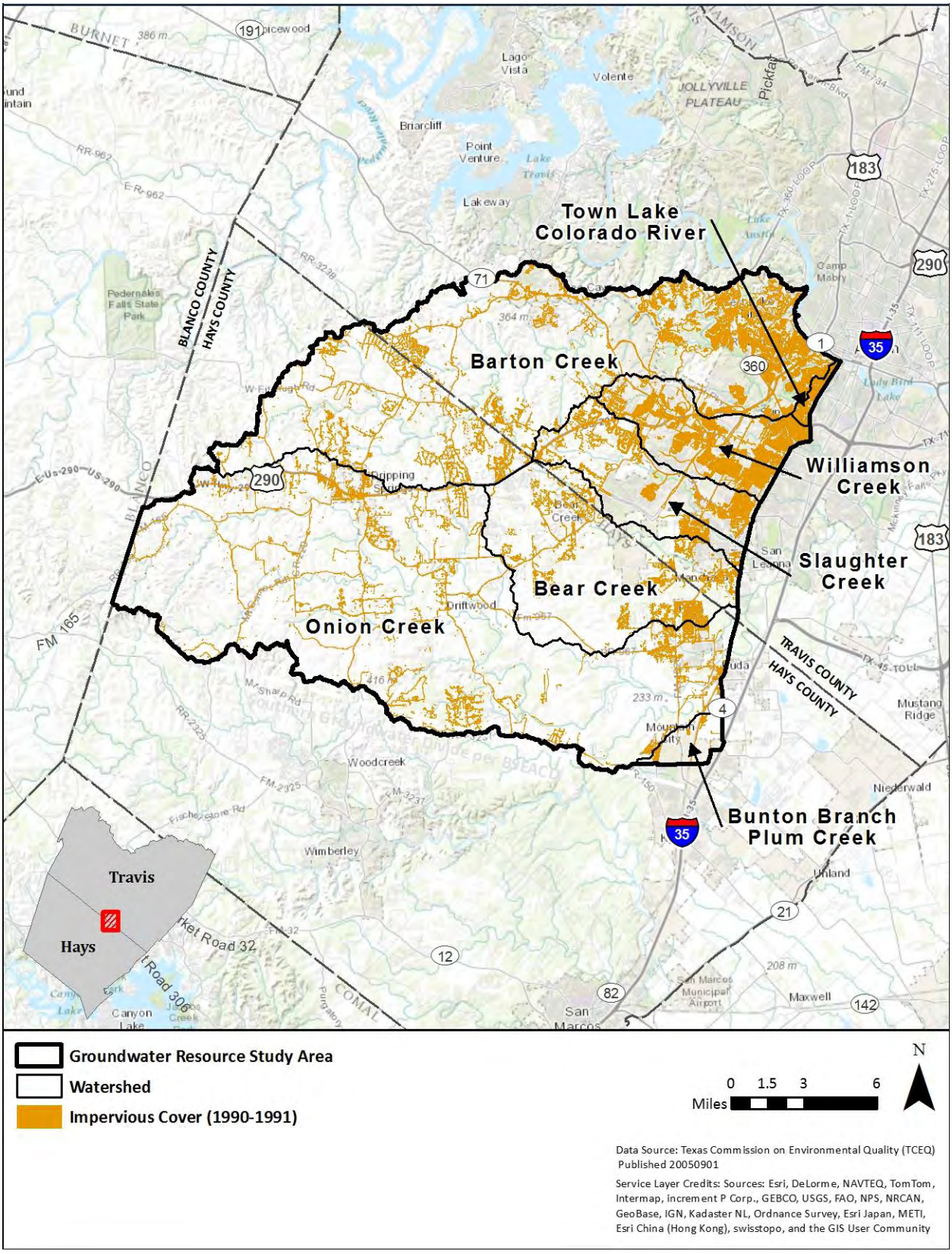

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Figure C-5: Aquifer Zones and Impervious Cover (2012) within the Groundwater RSA

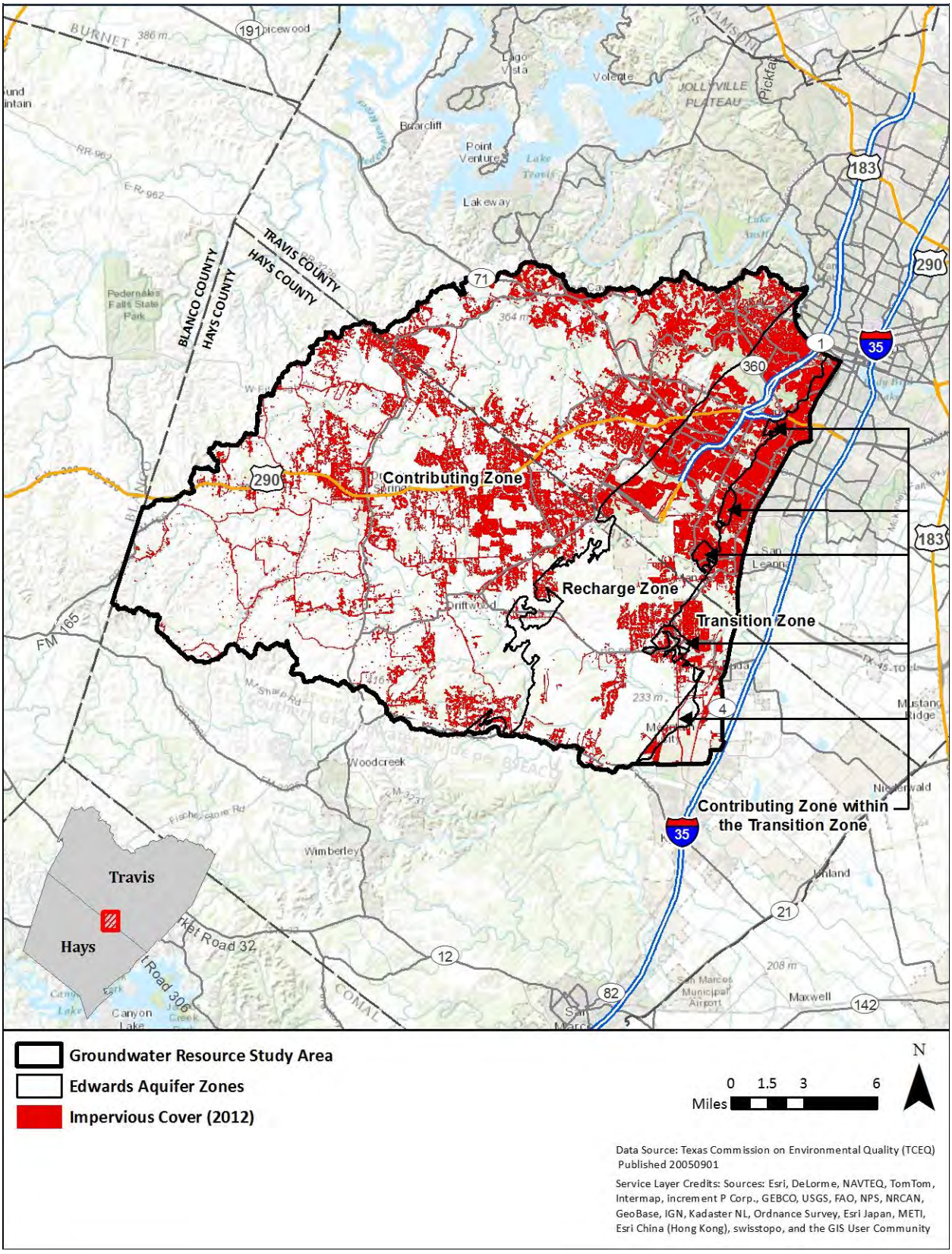

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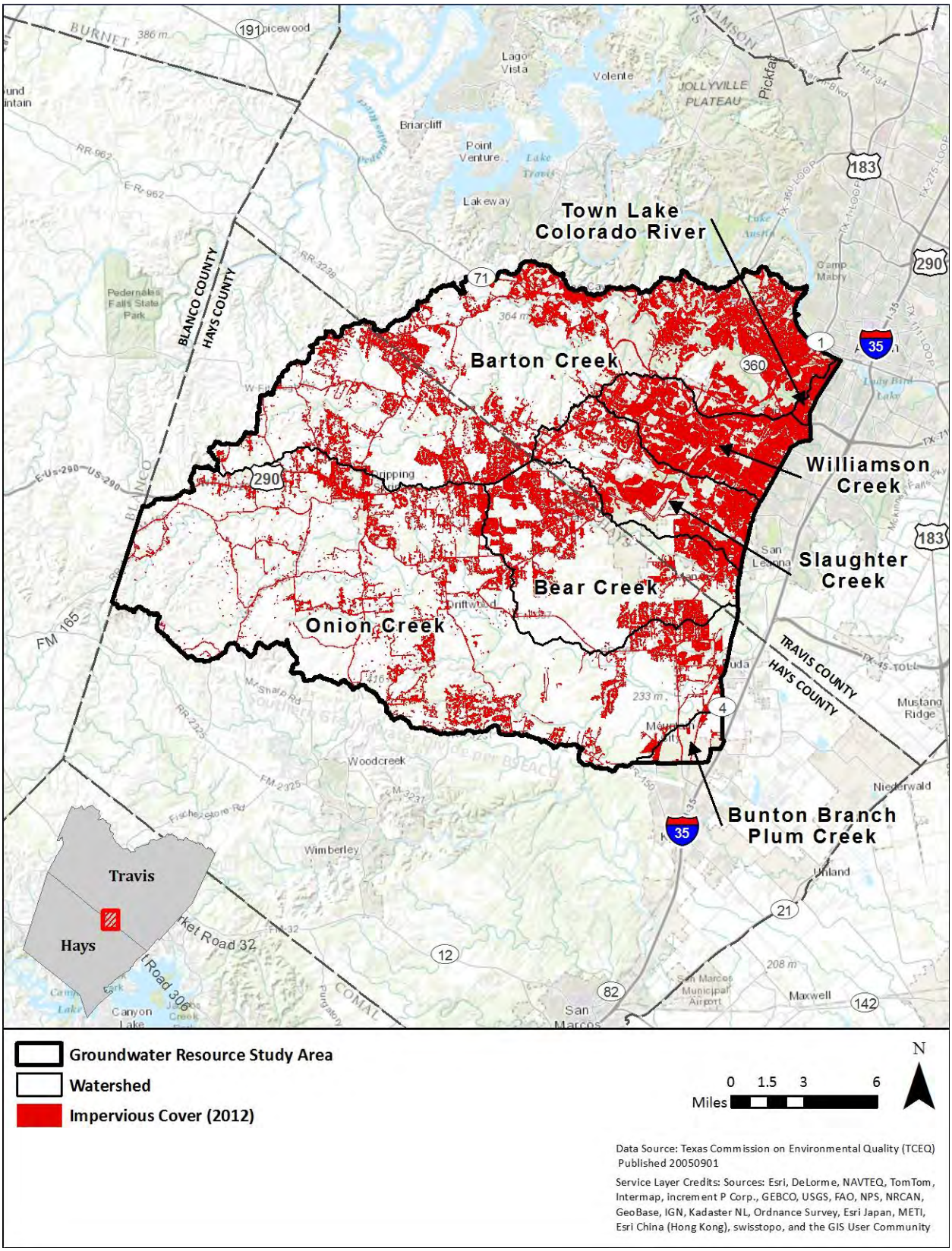
Figure C-6: Watersheds and Impervious Cover (2012) within the Groundwater RSA



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Attachment D
Methodology for Impervious Cover Change Detection within the SH 45SW Groundwater Resource Study Area

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State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626

Travis and Hays Counties, Texas

Methodology for Impervious Cover Change Detection within the SH 45SW Groundwater Resource Study Area

Prepared by:

Texas Department of Transportation

CSJ: 1200-06-004 & 1200-07-001

December 2014

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1.0 INTRODUCTION

This report presents the methodology used for assessing impervious cover change detection located within the Groundwater Resource Study Area (RSA) associated with the Texas Department of Transportation's (TxDOT) State Highway 45 Southwest (SH 45SW) project. The proposed project is approximately 4 miles long and extends from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626 in Travis and Hays Counties, Texas (CSJs: 1200-06-004 and 1200-07-001). The Groundwater RSA, as evaluated in the SH 45SW *Cumulative Impacts Technical Report*, is considered to be the area of the Barton Springs segment of the Edwards Aquifer that is regulated by the Texas Commission on Environmental Quality (TCEQ) or the Barton Springs/Edwards Aquifer Conservation District (BSEACD). The southern boundary of the RSA represents the approximate groundwater divide between the Barton Springs segment of the Edwards Aquifer and the San Antonio segment (BSEACD, 2003; Hunt et al., 2006). The northern and western boundaries of the RSA represent the extent of the TCEQ-regulated contributing zone. The eastern boundary of the RSA represents the boundary between the transition zone and the saline zone of the Edwards Aquifer, and is the eastern limit of TCEQ jurisdiction under the Edwards Aquifer Rules. The RSA is located in Travis and Hays Counties and includes the Edwards Aquifer contributing zone, recharge zone, and transition zone, and contributing zone within the transition zone of the Barton Springs segment of the Edwards Aquifer.

The methodology described in this report was used for assessing impervious cover change detection located in the Groundwater RSA and ranging in time from 1970 to 2012. **Section 2.0** of this report discusses the data sources used for the analysis, **Section 3.0** discusses data preparation, and **Section 4.0** discusses the GIS procedures utilized for extracting the impervious cover data from the imagery.

2.0 DATA

Imagery was selected from three time periods at approximately 20 year intervals. Because of incomplete coverage, the 1970 dataset utilizes imagery from 1970, 1973 and 1974, and the 1990 dataset uses imagery from 1990 and 1991. The 2012 data is comprised of imagery solely from that year. The 2012 dataset is 4-bands consisting of red, green and blue channels plus a near infra-red channel. The 1970 and 1990 datasets are black and white. In this methodology discussion, 1990 will refer to 1990 and 1991 imagery and 1970 will refer to imagery from 1970, 1973 and 1974.

The 1970 dataset consists of three distinct data sources. Texas Natural Resources Information System (TNRIS) was used as the source of the 1970 imagery of Travis County and 1974 imagery of Hays County. Each dataset differs in resolution, aerial coverage and direction of flight path. The 1970 imagery consists of 52 individual frames, each covering approximately 2,700 acres with 50 percent overlap of adjacent images. The 1974 imagery consists of 26

individual frames, each covering approximately 14,300 acres with 50 percent overlap. The TNRIS coverage was incomplete for the RSA so it was necessary to obtain additional imagery through the Unites States Geological Survey (USGS). The 1973 USGS data consists of 106 individual images, each covering approximately 7,400 acres with 50-60 percent overlap.

The 1990 data was also sourced through TNRIS and consists of 207 individual aerial images. Hays County is represented primarily by the 1991 images and Travis County by the 1990 images. Each image covers approximately 6,100 acres and overlaps adjacent imagery by 50 percent. Total images for 1990 and 1991 are 83 and 124 respectively.

The 2012 imagery source is the USDA National Agriculture Imagery Program (NAIP). This dataset consists of 41 images each representing a single Digital Ortho Quarter Quad (DOQQ) which covers approximately 10,300 acres. NAIP imagery is provided in a georeferenced format which allows it to be utilized spatially with no further processing.

Two ancillary data layers were acquired for increasing the accuracy of the final product. The first layer was acquired from TNRIS and consists of centerlines for all TxDOT roads in the RSA. The purpose of this data layer is to account for paved surfaces located underneath tree canopies. The utilization of this layer will be further discussed in the methodology section. The 2010 Land Fragmentation (Vacant Land Inventory) shapefile from the Capitol Area Council of Governments (CAPCOG) was acquired for use in data cleanup. This will also be further discussed in **Section 4.0** below.

3.0 DATA PREPARATION

The 2012 data was supplied in a georeferenced format and did not require any further post-processing. The 1970 and 1990 imagery was not supplied in a georeferenced format so post processing was necessary. This procedure involved mosaicing (fitting adjacent images together in a strip) the imagery and subsequently georeferencing the mosaiced image so it could be analyzed spatially and temporally.

Mosaicing of the imagery was performed with Adobe Photoshop CS6. Imagery from each dataset was mosaiced into strips corresponding to the original flight lines. A total of 40 flight line strips were georeferenced for the 1970 and 1990 datasets. These strips were then loaded into ArcMap 10.2 and georeferenced using a 3rd order polynomial transformation. Georeferencing within ArcMap to a 3rd level polynomial involves locating at least 12 ground points in the imagery that can also be located on current imagery that is already spatially referenced. Twelve points is the minimum number of points; however, in this case at least 20 points were used to improve accuracy.

Georeferencing of the imagery was time-consuming, particularly in the case of the 1970 data where ground points were difficult to identify in areas where there were few man-made

structures (**Figure 1**). Inconsistencies in flight lines compounded this difficulty as some flights were conducted north to south while others were flown northwest to southeast (**Figure 2**).

Figure 1: Comparison of Imagery for 1970 and 2012

Figure 1 - Comparison of imagery for 1970 (left) and 2012 (right) illustrating degree of difficulty in locating common points in both time periods. Location of individual trees or ground points is obscured by an influx of Ashe Junipers.

76 **Figure 2: Comparison of Flightlines for Travis County (1970) and Hays County (1974)**

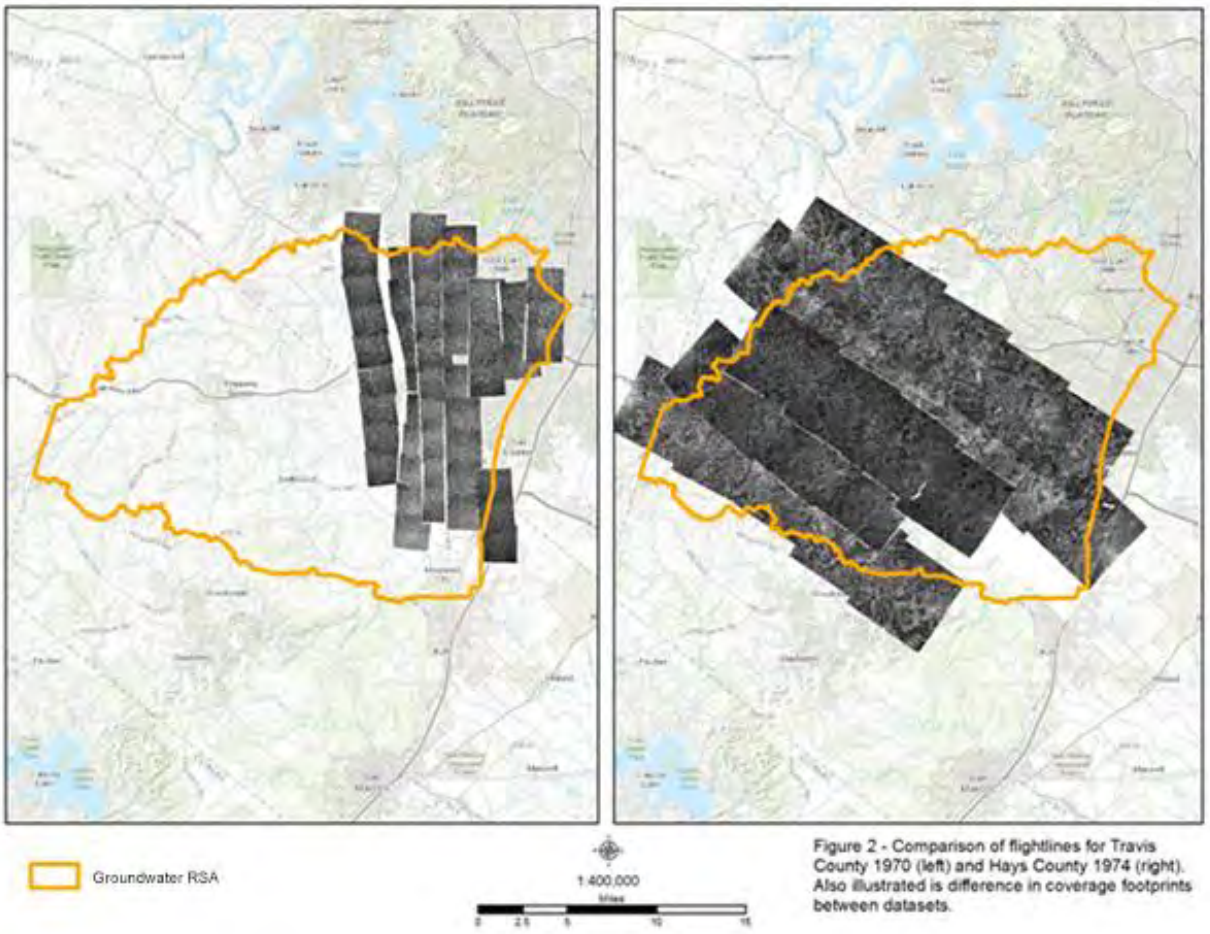

Figure 2 - Comparison of flightlines for Travis County 1970 (left) and Hays County 1974 (right). Also illustrated is difference in coverage footprints between datasets.

4.0 METHODOLOGY

Methodologies utilizing remote sensing for impervious cover detection are well represented in existing literature. One of the most common methods utilizes supervised training classification of imagery for detection of exposed impervious surfaces and supplementing this data with a buffered road layer to account for road surfaces under vegetation canopies (**Figure 3**) (Goetz, et. al., 2003; Hester, et. al., 2008; New Jersey, 2000).

The following is the basic outline of steps used to create impervious cover shapefiles:

1. Create supervised training field of impervious surfaces using 2012 4-band NAIP using ERDAS Imagine remote sensing software.
2. Create raster file of detected impervious surfaces using ERDAS Imagine.
3. Buffer road centerline file to create roadway polygons. Road centerlines were buffered a total width of 30 feet (see **Section 4.2**).
4. Merge roadway polygons with impervious cover polygons.
5. Erase any polygons falling within vacant land polygons. These polygons were most likely noise misrepresenting bare ground as impervious cover (see **Section 4.3**).
6. Overlay a grid, visually inspect the impervious cover polygon file, and erase any polygons not corresponding to an impervious surface.
7. Overlay the impervious cover file (copy) on the 1990 black and white imagery and erase any polygons not corresponding to 1990 impervious surfaces.
8. Repeat Step 7 for 1970 imagery.
9. Clip completed impervious cover files for each time period to each respective Edwards Aquifer zone and subsequently subdivide into the watersheds within that zone. Edwards Aquifer zones include the contributing zone, recharge zone, transition zone, and contributing zone within transition zone.

4.1 Steps 1-2

Using ERDAS Imagine remote sensing software, a mosaic of the 2012 4-band imagery was used to create a supervised training field of impervious surfaces. This step involved visually inspecting the imagery and highlighting various areas of anything that was known to be impervious, carefully considering many possible variations in reflectance. Next, the supervised classification algorithm was executed and any pixel matching the reflected signature of the training fields was marked as impervious. Finally, a raster image file was created representing the detected impervious surfaces and then exported to a shapefile for use in ArcMap 10.2.

109 **Figure 3: Section of Roadway Partially Obscured by Overhanging Vegetation**

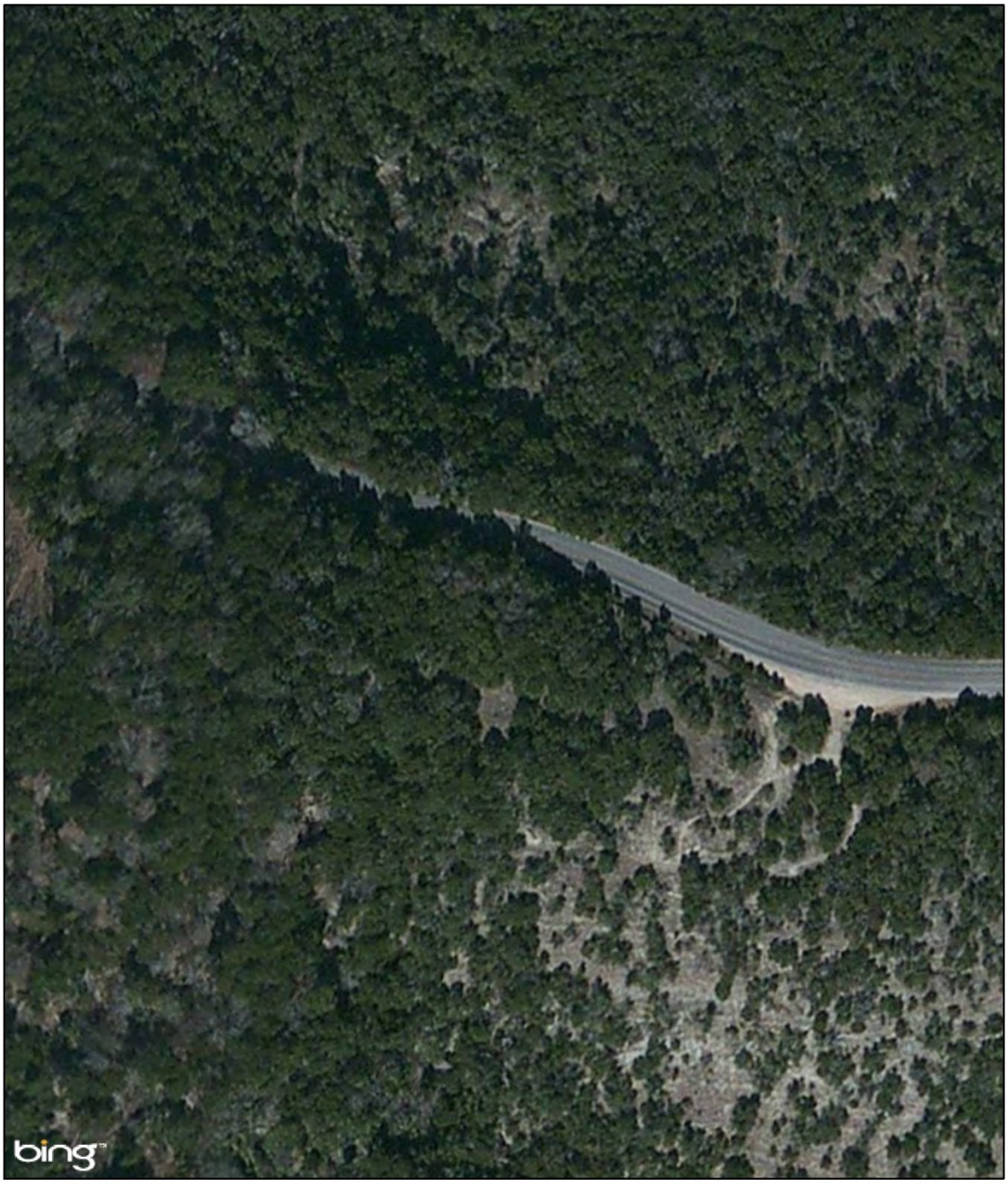

Figure 3 - Section of Roadway partially obscured by overhanging vegetation

Although the 2012 NAIP imagery lacks the spectral resolution of available LANDSAT imagery, it was necessary to use because of the better spatial resolution. The tradeoff in utilizing this imagery was the introduction of "noise" from the similar reflective signature between actual impervious surfaces and bare ground. Due to drought conditions existing during the 2012 photography flights, exposed bare ground was higher than normal, resulting in more noise (**Figure 4**). This required a more rigorous visual inspection for unwanted polygons than would have normally been expected. The 2010 Land Fragmentation (Vacant Land Inventory) shapefile was used to erase any polygons that were located in vacant parcels and remove them from the visual inspection process.

4.2 Steps 3-4

A large portion of the RSA is heavily vegetated so consideration must be given to impervious surfaces that are obscured by overhanging vegetation. The TxDOT 2012 road database contains centerlines for all TxDOT-maintained roadways. However, this database does not contain road widths so considerable efforts were necessary to check road widths on aerial imagery within the RSA. These spot checks yielded an average road width of 30 feet, and subsequently road centerlines were buffered a total width of 30 feet to represent roads in the study area. The road shapefile was then merged with the impervious cover shapefile created in the previous steps.

4.3 Step 5

Visual inspection and editing of the impervious cover file was the most labor intensive part of this procedure. Therefore, additional steps were taken to reduce the area that needed to be inspected.

The 2010 Land Fragmentation (Vacant Land Inventory) from CAPCOG, in shapefile format, provides polygons representing parcels that contain no manmade features or structures. This file was used to erase any polygons that were contained within the vacant parcels as they would most likely be noise misrepresenting bare ground as impervious cover. These vacant areas were still subjected to a less intensive visual inspection in case a structure had been built between the creation of the vacant land database (2010) and the most recent aerial imagery (2012).

4.4 Step 6

To aid in the inspection process, a grid was created over the study area of cells each encompassing approximately 6,000 acres. This grid minimized any inspection overlap where the inspector may stray into areas that have already been covered. These cells were visually inspected one at a time for unwanted (non-impervious) polygons, which were subsequently deleted (**Figure 5**).

145 **Figure 4: Areas of Exposed Soil and Rock Miscategorized as Impervious Surface**

Figure 4 - Areas of exposed soil and rock miscategorized as impervious surface

Figure 5: Comparison of Impervious Cover Polygons Before and After Visual Cleanup

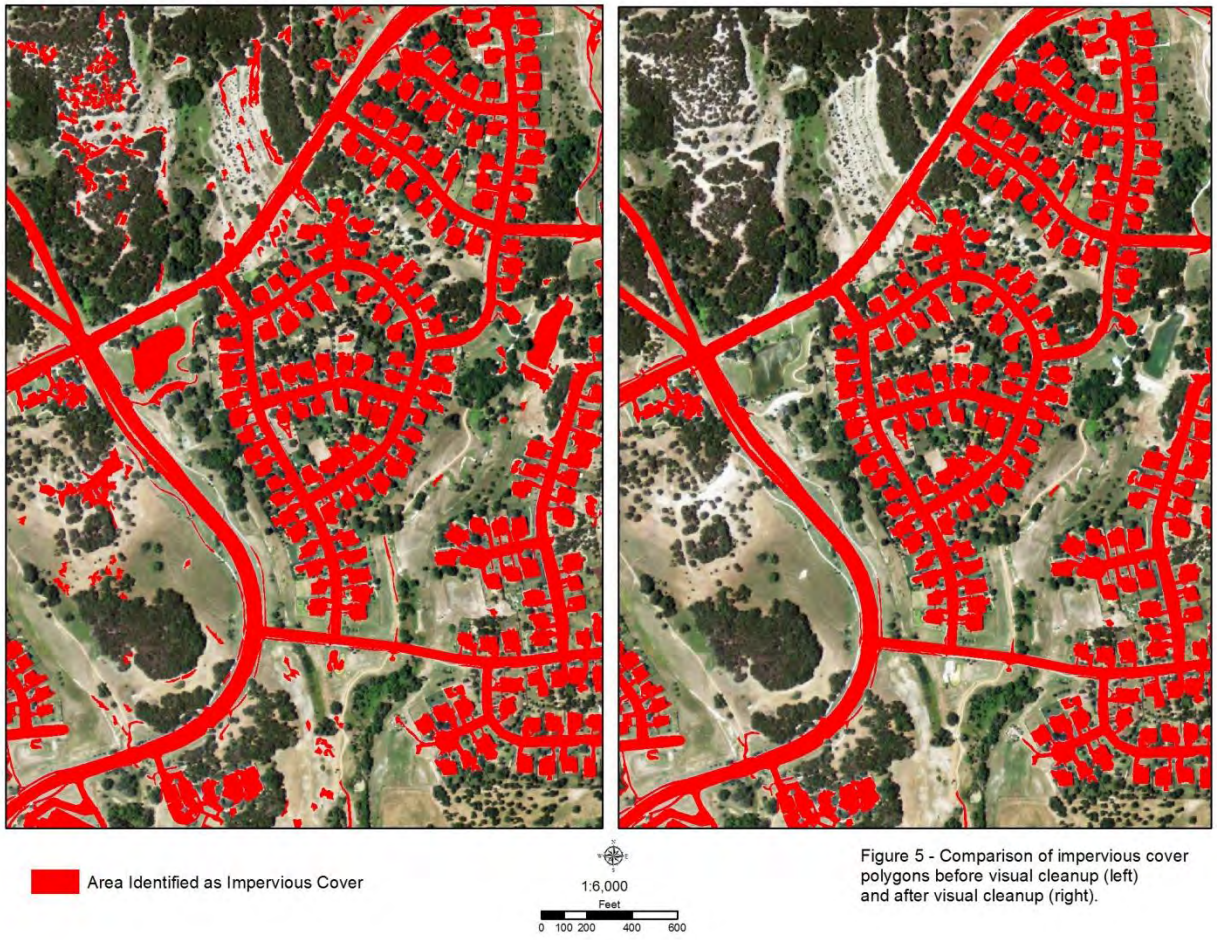

Figure 5 - Comparison of impervious cover polygons before visual cleanup (left) and after visual cleanup (right).

4.5 Step 7-8

Once the 2012 impervious cover polygon layer was completed, it was copied to a new layer which was overlaid on the 1990 imagery. The visual inspection process was then repeated. In this case, the inspector was not looking for noise produced from signature overlap, but rather areas of impervious cover that were present in 2012 but not present in 1990. The process was then repeated for the 1970 imagery.

4.6 Step 9

Finished impervious cover files for each time period were clipped into each respective Edwards Aquifer zone and subsequently subdivided into the watersheds within each zone. Calculations were completed for each watershed to show percentage of impervious cover within that subdivision and aquifer zone for each time period.

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APPENDIX J
WATERS OF THE U.S. EVALUATION TECHNICAL REPORT

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State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626

Travis and Hays Counties, Texas

Waters of the U.S. Evaluation Technical Report

Prepared by:

Texas Department of Transportation

CSJ: 1200-06-004 & 1200-07-001

January 2015

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Attachment A – Figures

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Figure 2: 100-year Floodplains and National Wetland Inventory Features in the New Tollway on Existing State-owned ROW Alternative

Figures 3a, 3b, and 3c: Potential Waters of the U.S. and Other Drainage Features within the New Tollway on Existing State-owned ROW Alternative

Attachment B – Photographs

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1.0 INTRODUCTION

This report presents the findings of investigations to identify potential waters of the United States (U.S.) located within the state-owned right-of-way (ROW) associated with the Texas Department of Transportation's (TxDOT's) and Central Texas Regional Mobility Authority's (CTRMA's) State Highway 45 Southwest (SH 45SW) project. The proposed project is approximately four miles long and extends from State Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626 in Travis and Hays Counties, Texas (CSJs: 1200-06-004 and 1200-07-001). **Figure 1** (**Attachment A**) provides the location of the proposed project on a TxDOT county map.

This report describes the waters of the U.S. features identified during field investigations conducted between December 2013 and February 2014. Field investigations included surveys of the area required for the New Tollway on Existing State-owned ROW Alternative, which encompasses approximately 311.65 acres and includes ROW for the proposed SH 45SW, as well as portions of ROW along MoPac, the existing portion of SH 45, Bliss Spillar Road, and FM 1626. For the purposes of this report, the surveyed area for the New Tollway on Existing State-owned ROW Alternative will be identified as the "state-owned ROW." **Figure 2** (**Attachment A**) shows the state-owned ROW, 100-year floodplains, and National Wetland Inventory (NWI) features on a U.S. Geological Survey (USGS) topographic base map. Representative photographs of waters of the U.S. in the state-owned ROW are provided in **Attachment B**.

Section 2.0 of this report discusses the methods used to identify and evaluate potential waters of the U.S. and other drainage features. **Section 3.0** presents the results of the investigations, including a general site description and description of waters of the U.S. in the state-owned ROW. **Section 4.0** summarizes the information.

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2.0 METHODS

Investigations to identify waters of the U.S. included an initial review of background information, including aerial photography (Google Earth, 2013), topographic maps (USGS, 1986; USGS, 1988), soils as mapped in the soil surveys of Travis and Hays Counties (Soil Survey Staff, 2013), U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps (USFWS, 2014), and Federal Emergency Management Agency (FEMA) floodplain maps. Following the background review, a pedestrian survey of the state-owned ROW was conducted. During the field visits, qualified biologists assessed observed drainage features including streams, swales, and depressions. Wetland determinations were conducted where depressions or other areas were observed to exhibit one or more wetland characteristics (e.g., hydrophytic vegetation or evidence of surface hydrology), as well as along the banks of streams. Wetland determinations were conducted in accordance with the 1987 U.S. Army Corps of Engineers (USACE) Manual (USACE, 1987) and the March 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Great Plains Region (Version 2.0) (USACE, 2010). The 2013 National Wetland Plant List (Lichvar, 2013) was referenced for the wetland indicator status of plant species encountered during wetland determinations. Completed wetland determination data forms are provided in **Attachment C**.

Observed drainage features in the state-owned ROW were assessed as to whether they meet the criteria of jurisdictional waters of the U.S. that are subject to regulation under Section 404 of the Clean Water Act (CWA). As defined at 40 § CFR 230.3(s), the term waters of the United States means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
   (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   (iii) Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. For regulatory purposes under the CWA, the term wetlands means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the Environmental Protection Agency (EPA) (USEPA, 2013).

The identified potential waters of the U.S. were classified based on 33 Code of Federal Regulations (CFR) 328.3(a) and joint USACE-EPA guidance on CWA jurisdiction following the U.S. Supreme Court's decision in *Rapanos v. United States* and *Carabell v. United States*. Current guidance (USACE, 2007) states that the USACE and EPA will assert CWA jurisdiction over the following:

1. Traditional navigable waters (TNW) and all wetlands adjacent to TNWs;
2. Relatively permanent waters (RPW), which include non-navigable tributaries of TNWs that typically flow year-round or have continuous flow at least seasonally, and all wetlands that directly abut RPWs; and
3. Other water bodies (such as non-RPWs, wetlands adjacent to non-RPWs, and wetlands adjacent to but not directly abutting an RPW) that are analyzed and determined to have a significant nexus with a TNW. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW.

In general, a drainage feature typically must exhibit a defined bed and banks with ordinary high water marks (OHWMs) to be considered a TNW or tributary of a TNW (e.g., an RPW or non-RPW). Swales or erosional features (e.g., gullies and small washes characterized by low volume, infrequent, or short duration flow) are generally not considered waters of the U.S. because they are not tributaries or they do not have a significant nexus to a TNW (USACE, 2007).

The boundaries of water features identified in the state-owned ROW were mapped using differentially corrected Global Positioning System units with sub-meter accuracy.

3.0 RESULTS AND DISCUSSION

This section provides a general description of the project vicinity followed by a description of potential waters of the U.S. that are present in the state-owned ROW.

3.1 Site Topography

The state-owned ROW is located near the eastern boundary of the Edwards Plateau Level III Ecoregion (Griffith et al., 2004) and is characterized by plateaus and valleys with interspersed relief from Bear Creek, Little Bear Creek, Danz Creek, Danz Creek Split, and swales and eroded washes that contribute to the larger streams. The state-owned ROW varies in elevation from about 850 feet to 710 feet above mean sea level (amsl). The northwestern and southeastern termini are around 830 and 710 feet amsl, respectively. The middle section of the state-owned ROW features rolling hills associated with Bear Creek, with the stream bed lying at approximately 728 feet amsl and the floodplain extending to nearly 750 feet amsl.

3.2 Site Plant Communities

The existing vegetation types in the state-owned ROW range from open savannah and prairie to dense brush and woodlands. The uplands contain thin topsoil on top of rocky limestone and support a tall or mid-grass understory with a brushy overstory comprised primarily of plateau live oak (*Quercus fusiformis*) and Ashe juniper (*Juniperus ashei*). Other common canopy trees of the rolling uplands include shin oak (*Q. sinuata var. breviloba*), Texas oak (*Q. buckleyi*), post oak (*Q. stellata*), and sugar hackberry (*Celtis laevigata*). Common grasses include little bluestem (*Schizachyrium scoparium*), silver bluestem (*Bothriochloa laguroides ssp. torreyana*), bushy bluestem (*Andropogon gerardii*), and King Ranch bluestem (*Bothriochloa ischaemum*). The flatter plains near the southern terminus are characterized by savannas dominated by honey mesquite (*Prosopis glandulosa*), prickly pear cactus (*Opuntia engelmannii var. lindheimeri*), and little bluestem.

3.3 Soils

Thirteen soil types are mapped within the state-owned ROW (Soil Survey Staff, 2013), most of which are clays or clay loams (**Table 3-1**). None of these soils are considered hydric by the Natural Resources Conservation Service (Soil Survey Staff, 2013). Speck stony clay loam underlies most (approximately 77 percent) of the state-owned ROW, with the other soils occurring around Bear Creek and the southeastern third of the state-owned ROW. Regionally, and within the state-owned ROW, the soil is known for being relatively thin and shallow over karst limestone bedrock. The soil is deeper in valleys and riparian areas.

Table 3-1: Soils Mapped in the State-owned ROW

Soil Series (Map Symbol)	Percent of State-owned ROW
Speck stony clay loam, 1 to 5 percent slopes (SsC)	76.5
Rumple-Comfort association, 1 to 8 percent slopes (RUD)	5.6
Speck clay loam, 1 to 3 percent slopes (SpB)	3.9
Crawford clay, 1 to 2 percent slopes (CrB)	3.5
Heiden clay, 3 to 5 percent slopes, eroded (HeC3)	3.4
Heiden clay, 1 to 3 percent slopes (HeB)	2.0
Mixed alluvial land, 0 to 1 percent slopes, frequently flooded (Md)	1.2
Medlin-Eckrant association, 8 to 30 percent slopes (MED)	1.1
Eckrant-Rock outcrop complex, 8 to 30 percent slopes (ErG)	0.9
Tarpley clay, 1 to 3 percent slopes (TaB)	0.8
Heiden clay, 3 to 5 percent slopes, moderately eroded (HeC2)	0.6
Tarrant soils, 5 to 18 percent slopes (TaD)	0.4
Denton silty clay, 1 to 5 percent slopes, eroded (DeC3)	0.1

Source: Soil Survey Staff, 2013

3.4 Hydrology

The state-owned ROW is located within the Slaughter/Onion Creek and Bear Creek (including Little Bear Creek) watersheds, which contribute to Onion Creek approximately 4.5 miles southeast of the state-owned ROW. The state-owned ROW is drained by four primary features, including Little Bear Creek near the southern terminus, Bear Creek in the central portion, and Danz Creek and Danz Creek Split (tributaries to Slaughter Creek) near the northern terminus. The remainder of the state-owned ROW is drained by a series of swales and eroded washes that contribute to the larger streams.

Figure 2 shows the 100-year floodplains and NWI features mapped in and near the state-owned ROW. 100-year floodplains cross the proposed project in five locations: Little Bear Creek, Bear Creek, Danz Creek (two crossings), and Danz Creek Split. Only one NWI feature is mapped in the state-owned ROW and is an isolated livestock pond that extends into the western edge of the ROW north of Bliss Spillar Road (**Figure 2**).

The state-owned ROW receives approximately 32 inches of precipitation annually, with the greatest precipitation falling in late spring and early fall (1981-2010 average; National Weather Service, 2013). During 2012, the Austin area recorded 35 inches of rain. From January 2013 through October 2013, the area had received 34 inches (National Weather Service, 2013). Nearly 10 inches of precipitation were recorded in the Austin area in October 2013, and 4 inches were recorded for November 2013. Based on these data, overall rainfall conditions in the

state-owned ROW were slightly above average and high amounts of precipitation fell in the two months preceding the field investigations.

3.5 Waters of the U.S. in the State-owned ROW

Field investigations and review of background information identified that the state-owned ROW contains portions of four waters of the U.S. that are subject to regulation under Section 404 of the CWA: Danz Creek (Stream 01), Danz Creek Split (Stream 02), Bear Creek (Stream 03), and Little Bear Creek (Stream 04). In addition, an isolated livestock pond (Pond 01) extends into the state-owned ROW north of Bliss Spillar Road. The locations of these features are provided on a USGS topographic map on **Figure 2** and on aerial photography on **Figures 3a, 3b,** and **3c**. **Table 3-2** summarizes the potential waters of the U.S. in the state-owned ROW. The features are described in **Sections 3.5.1** through **3.5.6** below, and representative photographs are provided in **Attachment B**.

Table 3-2: Summary of Waters of the U.S. in the State-owned ROW

Feature	Type[1]	Acreage in State-owned ROW	Water of the U.S.?	Within 100-year Floodplain?
Stream 01 (Danz Creek) (Crossing 01)	ES (non-RPW)	0.45	Yes	Yes
Stream 01 (Danz Creek) (Crossing 02)	ES (non-RPW)	0.30	Yes	Yes
Stream 02 (Danz Creek Split)	IS (non-RPW)	0.24	Yes	Yes
Stream 03 (Bear Creek)	IS (non-RPW)	0.50	Yes	Yes
Stream 04 (Little Bear Creek)	IS (non-RPW)	0.41	Yes	Yes
Pond 01	Isolated livestock pond	0.06	No	No

[1] *ES = Ephemeral Stream; IS = Intermittent Stream; RPW = Relatively Permanent Water*

No wetlands were identified in the state-owned ROW during field investigations. Several drainage swales that do not have defined beds and banks or OHWMs were observed in the state-owned ROW. These swales are not expected to be considered waters of the U.S. because they are not tributaries of and do not have a significant nexus to TNWs. In addition, a notable depression was observed that contained standing water and hydrophytic vegetation during the December 2013 field investigations (see OP 4 on **Figure 3b** and **Photo 01**). A wetland determination was conducted at this feature and identified that it did not contain hydric soils (see OP 4 data form in **Attachment C**). As a result, this feature does not meet the criteria for a wetland and is not a water of the U.S.

3.5.1 Stream 01 (Danz Creek) – Crossing 01

Danz Creek is an ephemeral drainage feature that crosses the state-owned ROW at Crossings 01 and 02 and joins with Danz Creek Split approximately 0.6 mile downstream of Crossing 02. The existing SH 45 roadway west of MoPac crosses this feature near the northern terminus of the project (**Figures 2** and **3a**). Within the state-owned ROW at Crossing 01, Danz Creek is relatively shallow (less than two feet deep) and braided. It crosses an area of limestone outcrop in the state-owned ROW that may have influenced the shallow and braided nature of this feature (**Photos 02** through **04**). The average width between the OHWMs is approximately 15 feet, but varies from 10 to 25 feet wide and from one to three channels in the ROW. A single channel occurs in the vicinity of the eastbound lanes, but the channel is braided into three separate channels in the vicinity of the westbound crossing (**Figure 3a**). The feature is crossed by the existing SH 45 facility via a divided roadway that completely spans the stream with the eastbound bridge; the westbound bridge has a set of pilings on an island between two channels above the OHWMs. A third channel splits off the main channels just north of the westbound bridge. In addition to exposed bedrock, the channel in the ROW is characterized by boulder, cobble, and silt deposits. The stream channel contained no flowing water during the February 2014 investigation, but small pools were present in the depressed portions of bedrock. This segment of Danz Creek shares a watershed catchment area with Danz Creek Split. The catchment area is approximately 3,172 acres (USEPA, 2014).

The vegetation along the banks of Danz Creek between the bridges and adjacent to the ROW boundary at Crossing 01 consists of woodlands. Dominant species include Ashe juniper, cedar elm, sugar hackberry, and plateau live oak. The understory is relatively dense and consists primarily of young Ashe juniper with scattered greenbrier (*Smilax bona-nox*), yaupon (*Ilex vomitoria*), Texas persimmon (*Diospyros texana*), agarita (*Mahonia trifoliata*), Gregg's acacia (*Acacia greggii*), and sugar hackberry. The herbaceous layer is sparse and includes little bluestem, switchgrass (*Panicum virgatum*), wild mustard (*Descurainia pinnata*), frostweed (*Verbesina virginica*), rain lily (*Cooperia pedunculata*), muhly grass (*Muhlenbergia* sp.), and Texas wintergrass (*Nassella leuchotricha*). A wetland determination was conducted on the banks of Stream 01 at Crossing 01 and no wetland was identified (see OP 1 data form in **Attachment C**).

Based on field investigations conducted upstream and downstream of the state-owned ROW, this drainage does exhibit one or more defined bed and bank channels with observable OHWMs. In addition, Danz Creek continues upstream as an intermittent blue line on USGS topographic maps for over three miles and drains approximately 3,172 acres. It also continues downstream from the state-owned ROW and is a tributary of Slaughter Creek. Therefore Danz Creek in the state-owned ROW was identified as a water of the U.S. A total of 0.45 acre of waters of the U.S. is located within the state-owned ROW at Crossing 01, all of which is non-wetland stream channel (**Table 3-2**).

3.5.2 Stream 01 (Danz Creek) – Crossing 02

This section of Danz Creek is an ephemeral drainage feature that crosses the state-owned ROW at Crossings 01 and 02 and joins with Danz Creek Split approximately 0.6 mile downstream of Crossing 02. The state-owned ROW crosses this stream at Crossing 02 near the northern terminus of the project on the proposed SH 45SW connector to MoPac North (**Figures 2** and **3a**). Within the state-owned ROW at Crossing 02, Danz Creek is very shallow (less than two feet deep) and relatively wide, as the channel crosses an area of limestone outcrop (**Photo 05**). The average width between the OHWMs is approximately 20 feet. The feature is crossed by MoPac with a divided roadway facility that spans the stream with both northbound and southbound bridges. In addition to exposed bedrock, the channel in the state-owned ROW is characterized by boulder, cobble, and silt deposits. The stream channel contained no flowing water during the investigation. This segment of Danz Creek shares a watershed catchment area with Danz Creek Split. This area is approximately 3,172 acres (USEPA, 2014).

The vegetation along the banks of this section of Danz Creek between the north and south-bound bridges and adjacent to the ROW boundary at Crossing 02 consists of woodlands. Dominant species include Ashe juniper, cedar elm, sugar hackberry, and plateau live oak. The understory is relatively dense and consists primarily of young Ashe juniper and greenbrier, with a few yaupon, Texas persimmon, and sugar hackberry. The herbaceous layer is sparse and includes little bluestem, streamside bristlegrass (*Setaria scheelii*), silver bluestem, frostweed, rain lily, broomweed (*Gutierrezia sarothrae*), and Texas wintergrass. A wetland determination was conducted on the banks of Stream 01 at Crossing 02 and no wetland was identified (see OP 2 data form in **Attachment C**).

Based on field investigations conducted upstream and downstream of the state-owned ROW, this drainage does exhibit a defined bed and bank with an observable OHWM. In addition, Danz Creek continues upstream as an intermittent blue line on USGS topographic maps for over three miles and drains approximately 3,172 acres. It also continues downstream from the state-owned ROW and is a tributary of Slaughter Creek. Therefore this section of Danz Creek in the state-owned ROW was identified as a water of the U.S. A total of 0.30 acre of waters of the U.S. is located within the state-owned ROW at Crossing 02, all of which is non-wetland stream channel (**Table 3-2**).

3.5.3 Stream 02 (Danz Creek Split)

Danz Creek Split is an intermittent drainage feature located near the intersection of MoPac and SH 45 (**Figures 2** and **3a**). Field investigations and background data suggest that this creek has intermittent flow, primarily during large rainfall events. Observed rack lines and pushed over vegetation indicate that a large quantity of water recently moved through the area prior to field investigations. Vegetation within the stream consists of woodlands and savanna with dense stands of false willow (*Baccharis neglecta*), Texas persimmon, Johnsongrass

(*Sorghum halepense*), western ragweed (*Ambrosia psilostachya*), prickly pear cactus, King Ranch bluestem, cedar elm, and Ashe juniper. A portion of the creek in the state-owned ROW is occupied by dense Ashe juniper woodlands with a few cedar elm in the canopy and dense understory of young Ashe juniper mixed with a few Texas persimmon, prickly pear, gum bumelia (*Sideroxylon lanuginosum*), and twistleaf yucca (*Yucca pallida*). Scattered Ashe juniper and other log, branch and leaf debris were piled on or next to a rip rap gabion and within areas of vegetation in the braided stream channels (**Photos 06** and **07**). The stream is characterized by silt, gravel, and cobble deposits, as well as braided swales that lacked signs of an OHWM, which could have been masked by the recent high water events. A wetland determination was conducted on the banks of Stream 02 and no wetland was identified (see OP 3 data form in **Attachment C**).

Danz Creek Split has been substantially altered within and adjacent to the state-owned ROW. A bridge-class culvert approximately 95 feet long and consisting of nine 10-foot by 6-foot boxes crosses the stream along Archeleta Boulevard. Downstream and east of the crossing, within the state-owned ROW, there is an approximately 30-foot-wide rip rap gabion wall across the stream. The stream channel is braided with two main channels within the state-owned ROW. These channels exhibit inconsistent OHWMs. Upstream observations indicate that without modification Danz Creek Split would exhibit an OHWM of approximately 10 feet.

Although Danz Creek Split has an inconsistently defined channel, it is a significant drainage that conveys large amounts of surface water to Slaughter Creek and Onion Creek during rainfall events. This determination is based on the mapped floodplain along the stream, the presence of large culverts, and field investigations conducted upstream and downstream of the state-owned ROW. In addition, the drainage, as part of Danz Creek (Stream 01), continues upstream as an intermittent blue line on USGS topographic maps for over three miles and drains approximately 3,172 acres. Danz Creek also continues downstream from the state-owned ROW and is a tributary of Slaughter Creek. As a result, Danz Creek Split is expected to be considered a water of the U.S. subject to regulation under Section 404 of the CWA. A total of 0.24 acre of waters of the U.S. is located within the state-owned ROW at the Danz Creek Split crossing, all of which is non-wetland stream channel (**Table 3-2**).

3.5.4 Stream 03 (Bear Creek)

Bear Creek is an intermittent stream that flows into Onion Creek approximately 4.5 miles downstream of the state-owned ROW. The state-owned ROW crosses Bear Creek approximately midway along the proposed project (**Figures 2** and **3b**). Within the state-owned ROW, Bear Creek averages approximately 50 feet between OHWMs (**Photos 08** and **09**). The channel consists of a large pool on the southern side of the project area and a boulder field that forms a minor rapid on the northern end of the state-owned ROW. The stream channel, which contained clear flowing water during the December 2013 field investigation, is approximately two to four feet below the OHWMs in the western portion of the state-owned ROW and one to

two feet deep in the eastern portion. While Bear Creek is mapped by the USGS as perennial (USGS, 2014), field investigations, including the observation that Bear Creek was found to be dry during the winter of 2012, indicated that this stream is intermittent. This segment of Bear Creek drains a watershed catchment area of approximately 5,412 acres (USEPA, 2014).

Dominant vegetation along the banks of Bear Creek and the surrounding floodplain includes cedar elm, Ashe juniper, American elm (*Ulmus americana*), escarpment black cherry (*Prunus serotina* var. *eximia*), sugar hackberry, and plateau live oak. American sycamore (*Platanus occidentalis*) is also present on the edge of the stream channel. Yaupon holly, possumhaw (*Ilex decidua*), stretchberry (*Forestiera pubescens*), agarita, and immature Ashe juniper dominate the sub-canopy layers. Common herbaceous species include inland sea oats (*Chasmanthium latifolium*), purpletop (*Tridens flavus*), cedar sedge (*Carex planostachys*), streamside bristlegrass, Virginia wildrye (*Elymus virginicus*), and southern dewberry (*Rubus trivialis*). Within the OHWMs, switchgrass and young cedar elm are common on the small in-stream vegetated bars, primarily where soils have been deposited in between boulders in the channel of the northern portion of the state-owned ROW. The southern portion of the channel is un-vegetated. The floodplain is characterized by abundant sand, silt, and gravel deposits, as well as leaf, limb, log, and trash debris in drifts on trees and other rooted vegetation. A wetland determination was conducted on the banks of Stream 03 and no wetland was identified (see OP 5 data form in **Attachment C**).

Based on field investigations, Bear Creek exhibits a well-defined bed and bank with an observable OHWM within the state-owned ROW. It also continues downstream from the state-owned ROW and is a tributary to Onion Creek and is connected to a TNW, the Colorado River. Therefore Bear Creek was identified as a water of the U.S. in the state-owned ROW. A total of 0.50 acre of waters of the U.S. is located within the state-owned ROW at the Bear Creek crossing, all of which is non-wetland stream channel (**Table 3-2**).

3.5.5 Stream 04 (Little Bear Creek)

Little Bear Creek is an intermittent drainage feature that contributes to Bear Creek approximately 2.2 miles downstream of the state-owned ROW. FM 1626 crosses this feature near the southern terminus of the proposed project (**Figures 2** and **3c**). In the vicinity of the state-owned ROW, Little Bear Creek is a relatively large stream with steep banks and a well-developed channel. During the field visit in February 2014, a new bridge was being constructed on FM 1626 over Little Bear Creek; this construction is not part of the SH 45SW project. Much of the creek in the state-owned ROW had been graded and re-contoured with clay loam soil so that the OHWMs were not visible at the time of the field visit (**Photo 10**); in this area the OHWM was approximated based on upstream and downstream observations (**Figure 3c**). A rock gabion dam was in place between the construction zone of the new bridge and the existing FM 1626 bridge (**Photo 11**). Based on observations upstream and downstream of the construction zone, the average width between the OHWMs of Little Bear Creek is approximately 30 feet, but

varies from 20 to 45 feet wide in the state-owned ROW. The channel depth varies from one to four feet deep below the OHWMs in the state-owned ROW. The natural channel in the vicinity of the crossing is characterized by boulder (downstream), cobble, gravel, sand and silt deposits. The stream channel contained no flowing water in the construction zone during the investigation, but a relatively large pool (two to three feet deep during the site visit) exists upstream of the ROW that is partially impounded by a natural gravel and cobble deposit (**Photo 12**). Downstream of the state-owned ROW the channel is more incised and filled with boulders, woody vegetation debris, and silt deposits (**Photo 13**). This segment of Little Bear Creek drains a watershed catchment area of approximately 3,638 acres (USEPA, 2014).

The vegetation along the banks of Little Bear Creek on the edges of the state-owned ROW consists of woodlands. Dominant species include Ashe juniper, cedar elm, willow (*Salix nigra*), and plateau live oak. The understory is relatively open and consists primarily of young Ashe juniper with greenbrier, Texas persimmon, and sugar hackberry. The herbaceous layer includes little bluestem, cedar sedge, switchgrass, frostweed, and Texas wintergrass. The channel is unvegetated except for a stand of dwarf palmetto (*Sabal minor*) that exists in a silt and gravel deposit on the western ROW boundary. Within the state-owned ROW, no vegetation was observed along Little Bear Creek. A wetland determination was conducted on the banks of Stream 04 and no wetland was identified (see OP 6 data form in **Attachment C**).

Based on February 2014 field investigations, Little Bear Creek exhibits a well-defined bed and bank channel with an observable OHWM along portions of the creek in the project vicinity (outside the construction zone). It also continues downstream from the state-owned ROW and is a tributary of Bear Creek. Therefore Little Bear Creek was identified as a water of the U.S. in the state-owned ROW. A total of 0.41 acre of waters of the U.S. is located within the state-owned ROW at the Little Bear Creek crossing, all of which is non-wetland stream channel (**Table 3-2**).

3.5.6 Pond 01

Pond 01 appears to be an isolated livestock pond that extends into the western edge of the state-owned ROW approximately 0.3 mile north of Bliss Spillar Road (**Figures 2** and **3b**; **Photo 14)**. The pond contained water during the December 2013 field investigations but appears to dry up during dry periods, based on review of past aerial photography. Pond 01 drains to another pond immediately to the south, but neither pond is connected to a water of the U.S. As such, Pond 01 is not a water of the U.S.

4.0 CONCLUSION

4.1 Summary

Waters of the U.S. present in the state-owned ROW include Danz Creek (Stream 01), Danz Creek Split (Stream 02), Bear Creek (Stream 03), and Little Bear Creek (Stream 04). One additional aquatic feature, an isolated livestock pond, extends into the western portion of the state-owned ROW but is not expected to be considered a water of the U.S. by the USACE because it is not connected to a USACE jurisdictional stream. No wetlands were observed in the state-owned ROW during the field investigations.

4.2 Section 404 Permits Anticipated

The roadway design includes bridges that span the OHWM of creeks identified as potential waters of the U.S. within the state-owned ROW. At Danz Creek (Stream 01, Crossings 01 and 02), the existing bridge structures would be widened. New bridge structures are proposed at Danz Creek Split (Stream 02) and Bear Creek (Stream 03). No structural work is proposed on the existing bridge over Little Bear Creek (Stream 04), although restriping would occur at this location. No discharge of dredged or fill material into waters of the U.S. is anticipated. Therefore, the proposed construction at waters of the U.S. in the state-owned ROW would not require a Section 404 permit under the CWA.

4.3 Agency Authority

The final determination of the jurisdictional status of the water features in the state-owned ROW rests with the USACE and the EPA (USEPA, 2013).

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ATTACHMENT A
Figures

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Figure 1: Project Location on County Map, SH 45SW, Travis and Hays Counties, Texas

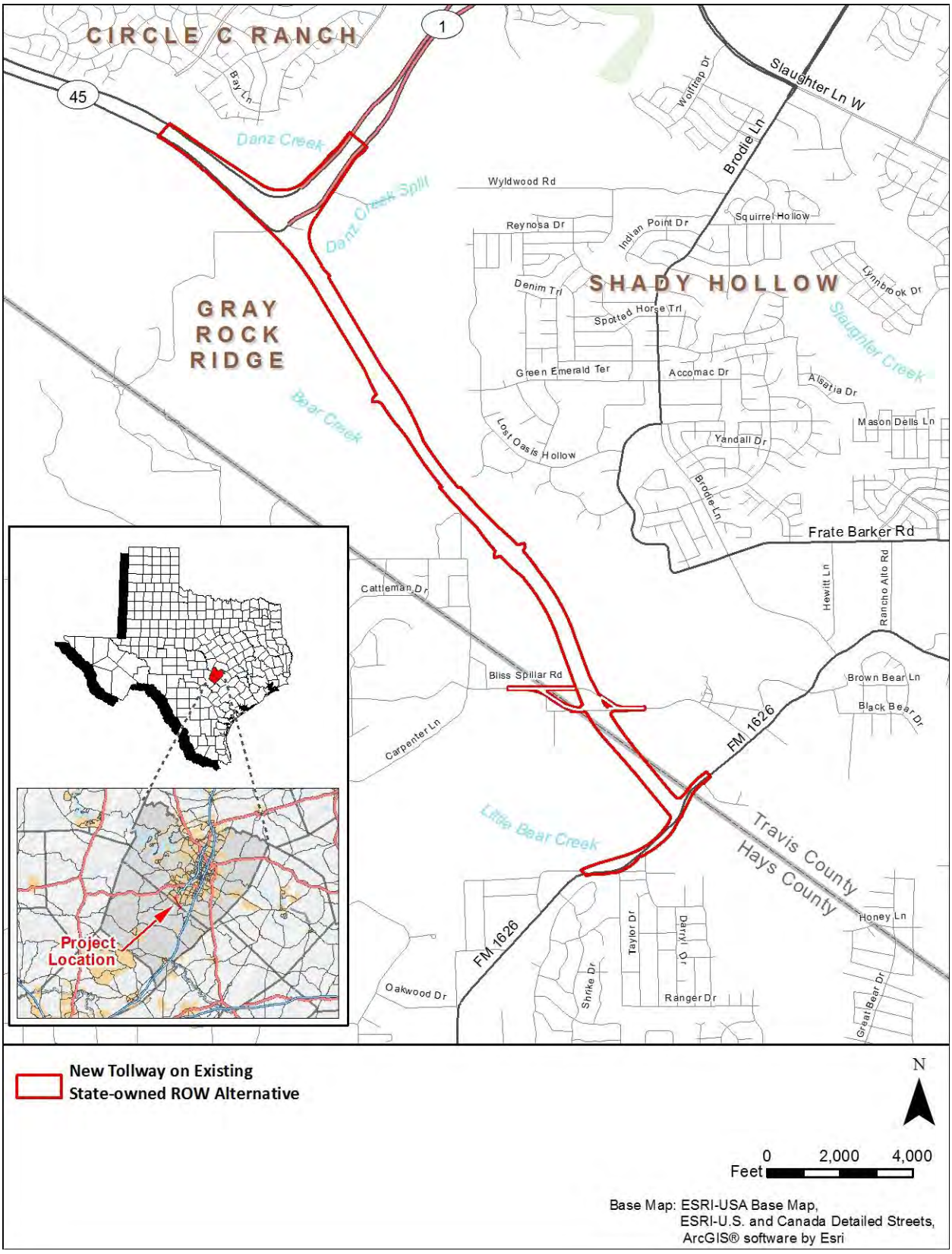

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Figure 2: 100-year Floodplains and National Wetland Inventory Features in the New Tollway on Existing State-owned ROW Alternative

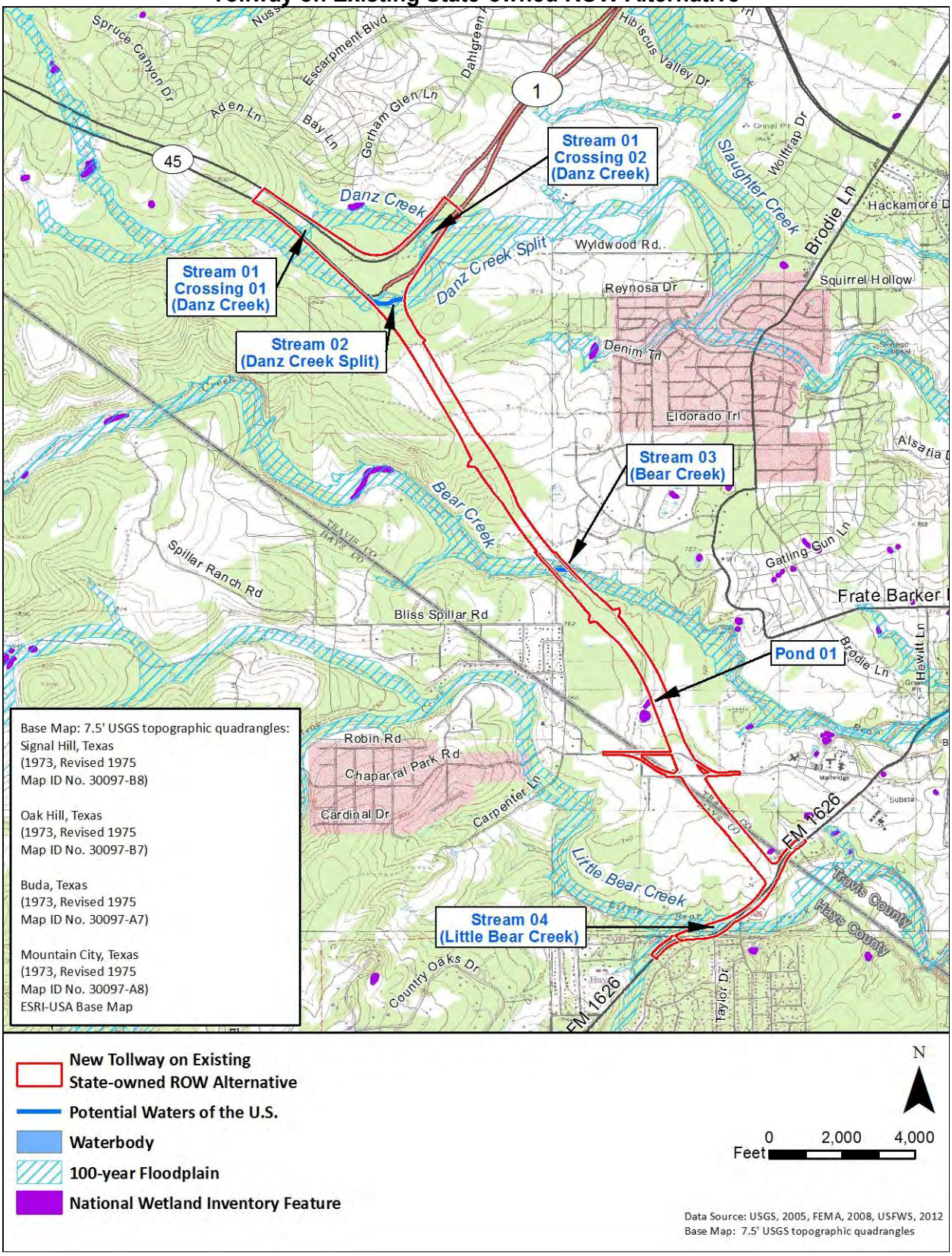

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Figure 3a: Potential Waters of the U.S. and Other Drainage Features within the New Tollway on Existing State-owned ROW Alternative

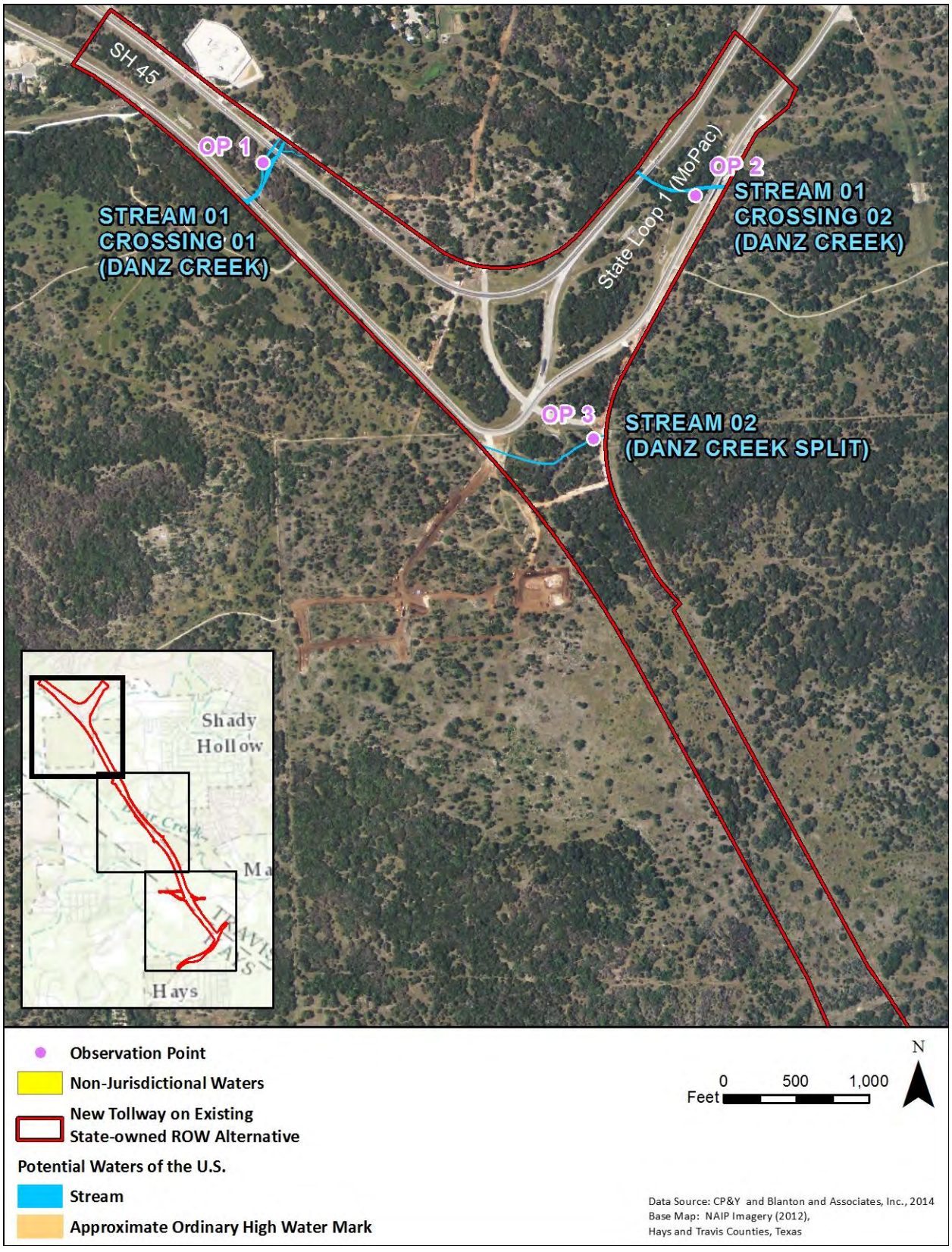

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Figure 3b: Potential Waters of the U.S. and Other Drainage Features within the New Tollway on Existing State-owned ROW Alternative

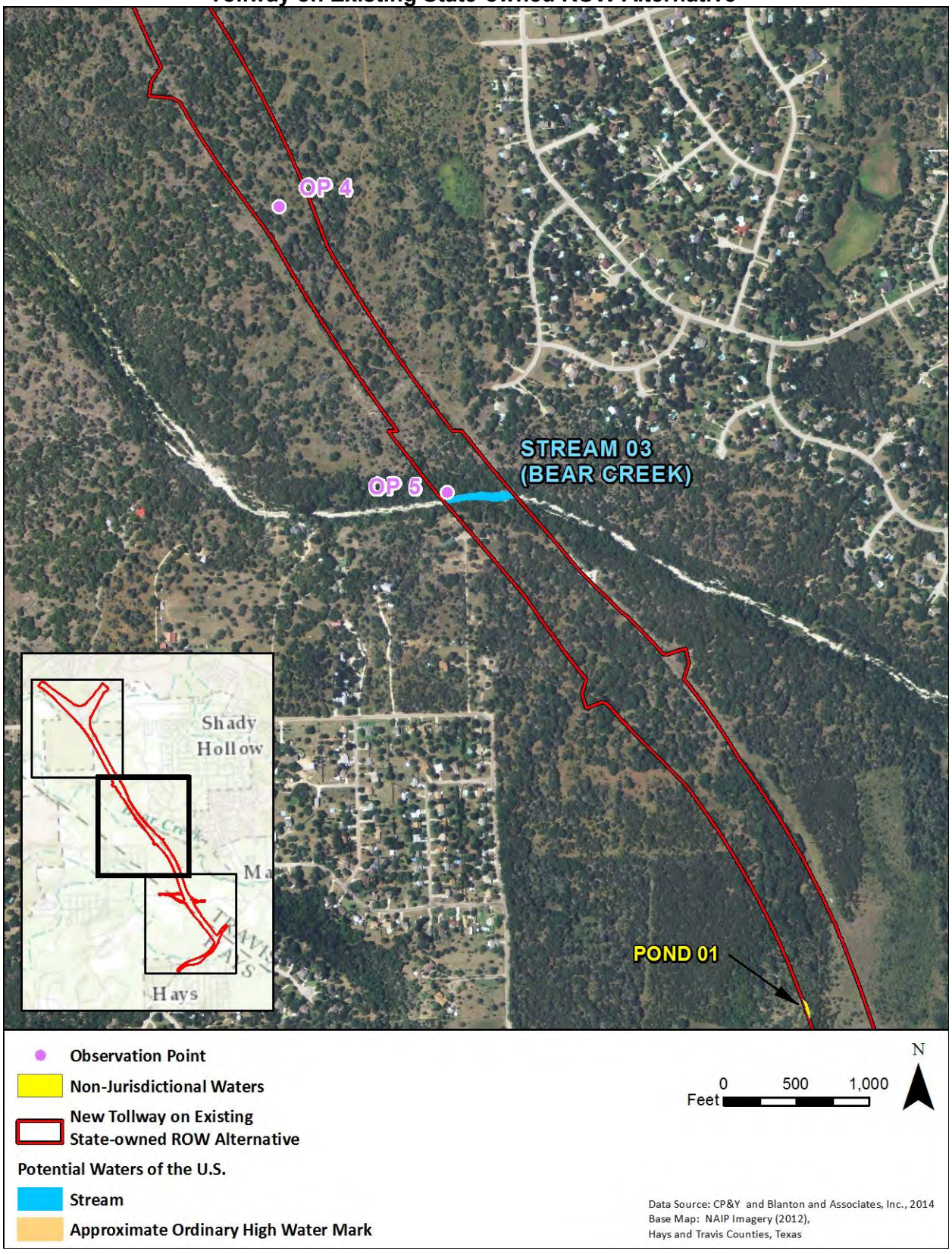

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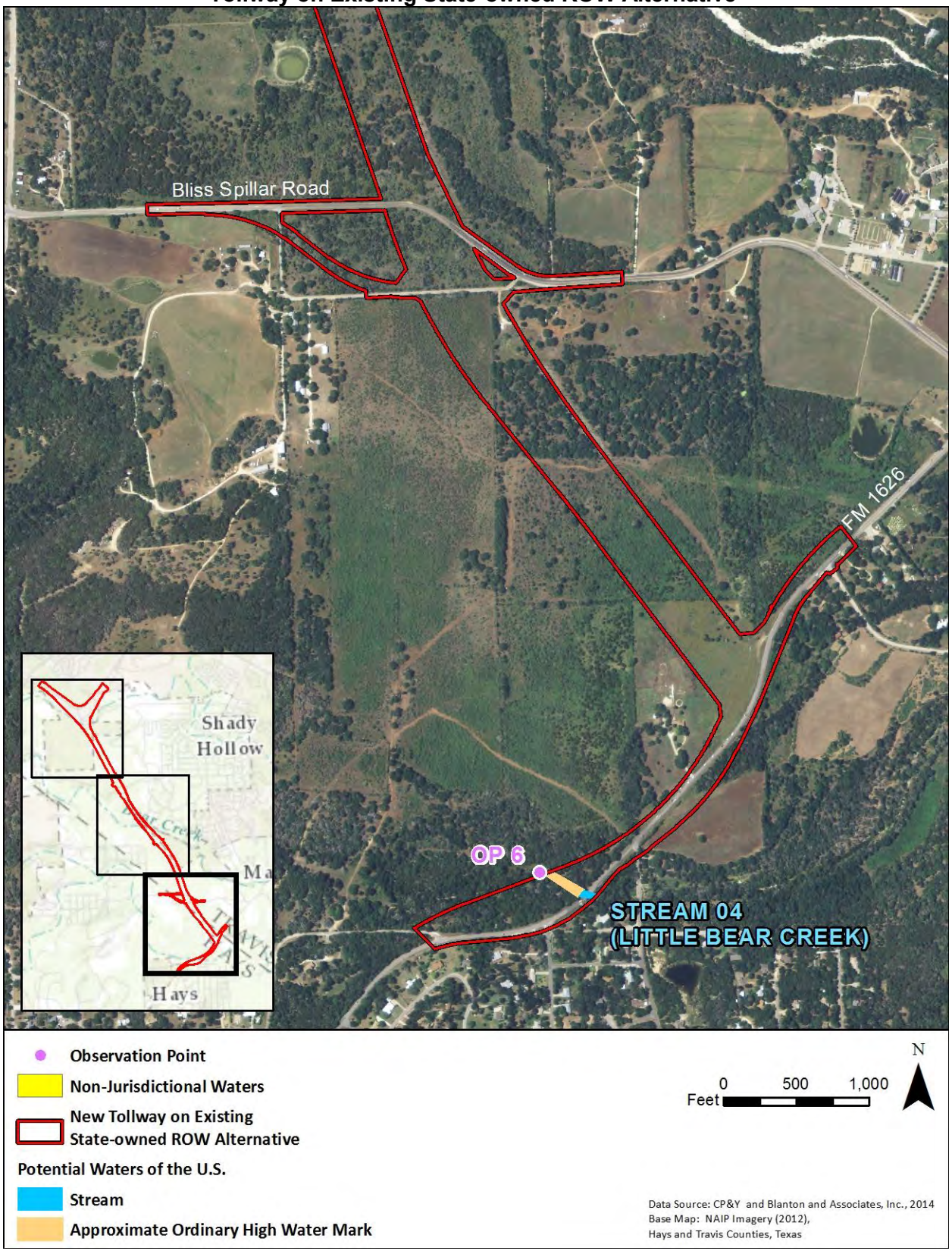
Figure 3c: Potential Waters of the U.S. and Other Drainage Features within the New Tollway on Existing State-owned ROW Alternative



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ATTACHMENT B
Photographs

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Photo 01: Depression within ROW that did not meet the criteria for a wetland and is not a water of the U.S, facing north (OP 4)

Photo 02: Stream 01 (Danz Creek), Crossing 01 near eastbound lanes, facing upstream (southwest)

Photo 03: One channel of Stream 01 (Danz Creek) at Crossing 01 between eastbound and westbound lanes, facing upstream (southwest)

Photo 04: Two channels of Stream 01 (Danz Creek) at Crossing 01 with an island in the middle, facing downstream (northeast)

Photo 05: Stream 01 (Danz Creek), Crossing 02 facing northwest towards MoPac North

Photo 06: Stream 02 (Danz Creek Split), facing upstream (northwest)

Photo 07: Stream 02 (Danz Creek Split), facing downstream (southeast). A riprap gabion is visible in the center of the photo

Photo 08: Stream 03 (Bear Creek), facing upstream (west)

Photo 09: Stream 03 (Bear Creek), facing downstream (east)

Photo 10: Stream 04 (Little Bear Creek) in ROW showing ongoing construction on FM 1626

Photo 11: Rock gabion between existing and new bridges at FM 1626 and Stream 04 (Little Bear Creek)

Photo 12: Little Bear Creek (Stream 04) facing upstream (west) at edge of ROW

Photo 13**:** Little Bear Creek (Stream 04) facing downstream (east) at edge of ROW

Photo 14: Isolated livestock pond located on the western ROW boundary and north of Bliss Spillar Road

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ATTACHMENT C
Wetland Determination Data Forms

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WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 1

Investigator(s): M. Kainer, B. Doggett, G. Casares, P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): braided stream | Local relief (concave, convex, none): concave | Slope (%): 0-3

Subregion (LRR): I | Lat: 30.177850° | Long: -97.893700° | Datum: WGS 84

Soil Map Unit Name: SsC - Speck stony clay loam, 1-5% slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No ____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**

Remarks: The absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicates the sampled area is not located in a wetland.

The sampled area is located within an ephermal stream bed. The stream bed is approximately 75% limestone cobbles, boulders, and bedrock.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *Juniperus ashei*	40	Yes	UPL
2. *Ulmus crassifolia*	5	No	FAC
3. *Celtis laevigata*	1	No	FAC
4. *Quercus fusiformis*	10	No	UPL
	56 = Total Cover		
50% of total cover:	28	20% of total cover:	11.2
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Juniperus ashei*	15	Yes	UPL
2. *Ilex vomitoria*	5	No	FAC
3. *Diospyros texana*	5	No	UPL
4. *Berberis trifoliolata*	1	No	UPL
5. *Eysenhardtia texana*	1	No	UPL
	27 = Total Cover		
50% of total cover:	13.5	20% of total cover:	5.4
Herb Stratum (Plot size: 5 ft)			
1. *Schizachyrium scoparium*	10	Yes	FACU
2. *Juniperus ashei*	10	Yes	UPL
3. *Carex planostachys*	10	Yes	UPL
4. *Ulmus crassifolia*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	35 = Total Cover		
50% of total cover:	17.5	20% of total cover:	7
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
% Bare Ground in Herb Stratum 50			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present **Yes** ____ **No** **X**

Remarks: The criteria for hydrophytic vegetation have not been met.

SOIL

Sampling Point: OP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/1	100					Silty Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Limestone bedrock

Depth (inches): 3 inches and below

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The criteria for wetland hydrology have not been met.

Drift deposits were observed during the field visit. These drift deposits appeared to be remnants of extreme, infrequent, or very brief flooding events and as such would not qualify for Wetland Hydrology Indicator B3.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 2

Investigator(s): M. Kainer, B. Doggett, G. Casares, P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): stream bed | Local relief (concave, convex, none): concave | Slope (%): 1-3

Subregion (LRR): I | Lat: 30.177048° | Long: -97.884318° | Datum: WGS 84

Soil Map Unit Name: SsC - Speck stony clay loam, 1-5% slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No _____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes _____	No **X**	
Hydric Soil Present?	Yes _____	No **X**	
Wetland Hydrology Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland? Yes _____ No X**

Remarks: The absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicates the sampled area is not located in a wetland.

The sampled area is located within an ephermal stream bed. The stream bed is approximately 75% limestone cobbles, boulders, and bedrock.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *Juniperus ashei*	70	Yes	UPL
2. *Ulmus crassifolia*	15	No	FAC
3.			
4.			UPL
	85 = Total Cover		
50% of total cover:	42.5	20% of total cover:	17
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Juniperus ashei*	20	Yes	UPL
2. *Ilex vomitoria*	10	Yes	FAC
3.			
4.			
5.			
	30 = Total Cover		
50% of total cover:	15	20% of total cover:	6
Herb Stratum (Plot size: 5 ft)			
1. *Chaerophyllum tainturieri*	1	No	FAC
2. *Taraxacum officinale*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	6 = Total Cover		
50% of total cover:	3	20% of total cover:	1.2
Woody Vine Stratum (Plot size: 30 ft)			
1. *Smilax bona-nox*			FACU
2.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
% Bare Ground in Herb Stratum 70			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present Yes _____ No X

Remarks: The criteria for hydrophytic vegetation have not been met.

SOIL

Sampling Point: OP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/1	100					Silty Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Limestone

Depth (inches): 6 and below

Hydric Soil Present? Yes ___ No X

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The criteria for wetland hydrology have not been met.

Drift deposits were observed during the field visit. These drift deposits appeared to be remnants of extreme, infrequent, or very brief flooding events and as such would not qualify for Wetland Hydrology Indicator B3.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 3

Investigator(s): M. Kainer, B. Doggett, G. Casares, P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): stream bed | Local relief (concave, convex, none): concave | Slope (%): 0-2

Subregion (LRR): I | Lat: 30.172522° | Long: -97.886657° | Datum: WGS 84

Soil Map Unit Name: SsC - Speck stony clay loam, 1-5% slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No ____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland? Yes ____ No X**

Remarks: The absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicates the sampled area is not located in a wetland.

The sampled area is located in an ephemeral stream bed.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *Juniperus ashei*	45	Yes	UPL
2. *Ulmus crassifolia*	5	No	FAC
3.			
4.			
	50 = Total Cover		
50% of total cover:	25	20% of total cover:	10
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Ilex vomitoria*	1	No	FAC
2. *Diospyros texana*	5	Yes	UPL
3. *Baccharis neglecta*	1	No	FAC
4. *Yucca rupicola*	10	Yes	UPL
5.			
	17 = Total Cover		
50% of total cover:	8.5	20% of total cover:	3.4
Herb Stratum (Plot size: 5 ft)			
1. *Rubus trivialis*	70	Yes	FACU
2. *Gutierrezia sarothrae*	20	No	UPL
3. *Bothriochloa laguroides ssp. Torreyana*	15	No	UPL
4. *Carex planostachys*	10	No	UPL
5. *Ilex vomitoria*	10	No	FAC
6. *Yucca ruplcola*	10	No	UPL
7. *Ambrosia trifida*	5	No	FAC
8. *Chaerophyllum tainturieri*	5	No	FAC
9. *Smilax bona-nox*	5	No	FACU
10. *Taraxacum officinale*	1	No	FACU
	151 = Total Cover		
50% of total cover:	75.5	20% of total cover:	30.2
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present Yes ____ No X

Remarks: The criteria for hydrophytic vegetation have not been met.

SOIL

Sampling Point: OP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/2	100					Clay Loam	Organic/duff layer on surface
5-18	10 YR 3/2	100					Clay Loam	Many limestone cobbles

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The criteria for wetland hydrology have not been met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 4

Investigator(s): M. Kainer, B. Doggett, G. Casares, and P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): plain | Local relief (concave, convex, none): slightly concave | Slope (%): 0-1

Subregion (LRR): I | Lat: 30.1578250° | Long: -97.878891° | Datum: WGS 84

Soil Map Unit Name: SsC - Speck stony clay loam, 1-5% slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No ____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes **X**	No ____	
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No **X**

Remarks: Although hydrophytic vegetation and and wetland hydrology are present, the absence of hydric soil indicates the sampled area is not located in a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *None*			
2.			
3.			
4.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 5 ft)			
1. *Eleocharis montevidensis*	60	Yes	FACW
2. *Eleocharis montana*	30	Yes	OBL
3. *Leersia lenticularis*	30	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	120 = Total Cover		
50% of total cover: 60	20% of total cover: 24		
Woody Vine Stratum (Plot size: 30 ft)			
1. *None*			
2.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present Yes **X** No ____

Remarks: The criteria for hydrophytic vegetation have been met.

SOIL

Sampling Point: OP 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10 YR 2/1	100					Clay Loam	
10-24	10 YR 2/1	95	10 YR 4/6	5	C	M	Clay	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes	X	No	___	Depth (inches): 0-2
Water Table Present?	Yes	___	No	X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Inundation viisible on sattelite imagery from USGS - 3/30/2003

Remarks: The criteria for wetland hydrology have been met.
Standing water was observed on 4 December 2013 but not on 18 December 2013.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 5

Investigator(s): M. Kainer, B. Doggett, G. Casares, P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 2-3

Subregion (LRR): I | Lat: 30.152376° | Long: -97.875371° | Datum: WGS 84

Soil Map Unit Name: Md - Mixed alluvial land, 0-1% slopes, frequently flooded | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No ____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland? Yes ____ No X**

Remarks: The absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicates the sampled area is not located in a wetland.

The sampled area is located on the north/east terrace above of Bear Creek.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *Juniperus ashei*	40	Yes	UPL
2. *Ulmus crassifolia*	25	Yes	FAC
3. *Quercus fusiformis*	10	No	UPL
4. *Platanus occidentalis*	5	No	FAC
	80	= Total Cover	
50% of total cover:	40	20% of total cover:	16
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Juniperus ashei*	10	Yes	UPL
2. *Ilex vomitoria*	10	Yes	FAC
3. *Diospyros texana*	5	No	UPL
4. *Berberis trifoliolata*	5	No	UPL
5.			
	30	= Total Cover	
50% of total cover:	15	20% of total cover:	6
Herb Stratum (Plot size: 5 ft)			
1. *Chasmanthium latifolium*	40	Yes	FACU
2. *Tridens flavus*	1	No	UPL
3. *Carex planostachys*	30	Yes	UPL
4. *Juniperus ashei*	5	No	UPL
5. *Ilex vomitoria*	20	No	FAC
6. *Berberis trifoliata*	10	No	UPL
7. *Croton fruticulosus*	15	No	UPL
8.			
9.			
10.			
	121	= Total Cover	
50% of total cover:	60.5	20% of total cover:	24.2
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
50% of total cover:	0	20% of total cover:	0
% Bare Ground in Herb Stratum 20			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present Yes ____ No X

Remarks: The criteria for hydrophytic vegetation have not been met.

SOIL

Sampling Point: OP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/4	100					Silty loam	shallow roots with org. matter
3-18	10YR 2/2	100					Silty loam	limestone pebbles

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The criteria for wetland hydrology have not been met.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: SH 45SW | City/County: Travis | Sampling Date: 12/18/2013

Applicant/Owner: TxDOT | State: TX | Sampling Point: OP 6

Investigator(s): M. Kainer, B. Doggett, G. Casares, P. Osborne | Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 2-3

Subregion (LRR): I | Lat: 30.125878° | Long: -97.863253° | Datum: WGS 84

Soil Map Unit Name: RUD - Rumple-Comfort association, 1-8% slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Yes X No ____ (If no, explain in remarks)

Are vegetation No, soil No, or hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are vegetation No, soil No, or hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland? Yes ____ No X**

Remarks: The absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicates the sampled area is not located in a wetland.

The sampled area is located on a terrace above the west bank of Little Bear Creek at FM 1626.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Staus
1. *Quercus fusiformis*	30	Yes	UPL
2. *Ulmus crassifolia*	15	Yes	FAC
3. *Fraxinus texensis*	5	No	UPL
4.			
	50 = Total Cover		
50% of total cover:	25	20% of total cover:	10
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Juniperus ashei*	20	Yes	UPL
2. *Ilex vomitoria*	15	Yes	FAC
3. *Diospyros texana*	1	No	UPL
4. *Sabal minor*	1	No	FACW
5. *Ligustrum japonicum*	1	No	UPL
	38 = Total Cover		
50% of total cover:	19	20% of total cover:	7.6
Herb Stratum (Plot size: 5 ft)			
1. *Chaerophyllum tainturieri*	40	Yes	FAC
2. *Calyptocarpus vialis*	25	No	FAC
3. *Verbesina virginica*	20	No	FACU
4. *Ambrosia trifida*	15	No	FAC
5. *Gutierrezia sarothrae*	10	No	UPL
6. *Rubus trivialis*	10	No	FACU
7. *Nassella leucotricha*	5	No	UPL
8. *Toxicodendron radicans*	1	No	FACU
9.			
10.			
	126 = Total Cover		
50% of total cover:	63	20% of total cover:	25.2
Woody Vine Stratum (Plot size: 30 ft)			
1. *Smilax bona-nox*	5	Yes	FACU
2.			
	5 = Total Cover		
50% of total cover:	2.5	20% of total cover:	1

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index Worksheet

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present Yes ____ No X

Remarks: The criteria for hydrophytic vegetation have not been met.

SOIL

Sampling Point: OP 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 3/4	100					Silty Loam	
3-18	10 YR 2/2	100					Silty Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks: The criteria for hydric soil have not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The criteria for wetland hydrology have not been met.

APPENDIX K
AGENCY COORDINATION

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Texas Department of Transportation®
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

July 2, 2013

Name
Title
Organization
Address
City, State Zip

Re: Invitation to become a Participating Agency on the proposed Texas Department of Transportation (TxDOT) project to extend SH 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626 in Travis and Hays Counties, Texas.

Dear Name:

The Texas Department of Transportation (TxDOT), in conjunction with the Central Texas Regional Mobility Authority (CTRMA), is initiating an Environmental Impact Statement (EIS) for a proposed project to extend SH 45 Southwest from MoPac to FM 1626, a distance of approximately four (4) miles. The study area for the project is located in the southern region of the Austin metropolitan area, in Travis and Hays Counties, Texas and would be constructed on new location.

The need for the proposed project stems from increasing congestion causing unreliable traffic operations on area roadways. Specifically, rapid population growth in southern Travis and northern Hays Counties is straining the existing transportation infrastructure in the area. This growth, combined with lack of direct, efficient travel corridors, is hindering the ability of area residents, commuters, and other travelers to access employment and activity centers in Austin. In order to address the identified needs, the purpose of the proposed project is to improve mobility and provide an efficient alternative route to congested local roadways in this rapidly growing area.

Alternatives intended to satisfy the identified purpose and need will be considered by TxDOT. Alternatives will be evaluated within the study area based on input from federal, state, and local agencies, as well as private organizations and concerned citizens.

Your agency has been identified as an agency that may have an interest in the proposed project due to the potential for effects to the natural and/or human environment, and input from your agency may be required for the proposed project. With this letter, we extend your agency an invitation to become a Participating Agency with TxDOT in the development of the EIS for the subject project. This designation

does not imply that your agency either supports the proposal or has any special expertise with respect to evaluation of the proposed project.

As a Participating Agency, responsibilities include identifying, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval that is needed for the project. We suggest that your agency's role in the development of the above project should include the following as they relate to your area of expertise:

1. Provide meaningful and early input on defining the purpose and need, determining alternatives to be considered, and the methodologies and level of detail required in the alternatives analysis.
2. Participate in coordination meetings and joint field reviews, as appropriate.
3. Timely review and comment on the pre-draft or pre-final environmental documents to reflect the views and concerns of your agency on the adequacy of the document, alternatives considered, and the anticipated impacts and mitigation.

Again, TxDOT is inviting the Barton Springs Edwards Aquifer conservation District to serve in a Participating Agency capacity. Please respond to TxDOT in writing with an acceptance or denial of this invitation within 30 days of the date of this letter. If your agency declines, please indicate the reason for declining.

If your agency chooses to serve as a Participating Agency, a copy of the draft Coordination Plan will be submitted for your review and comment. The draft Coordination Plan provides additional insight regarding the overall project review process as well as specific roles and responsibilities for Participating Agencies.

Additionally, we would also like to invite your participation at the upcoming scoping meetings. An Agency Scoping Meeting is scheduled on Wednesday, July 31, 2013 from 3:00-4:30 PM at the TxDOT Austin District, Building 7 large conference room. A Public Scoping Meeting/Open House is tentatively scheduled for mid-August. Additional information regarding this meeting will be available at the agency scoping meeting and via the TxDOT website. Copies of the Coordination Plan will be available at both of these meetings.

If you have any questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of this EIS, please contact:

Mr. Doug Booher
TxDOT – Environmental Affairs Division
125 E. 11th Street
Austin, Texas 78701
(512) 416-2663
Doug.booher@txdot.gov

Thank you for your cooperation and interest in this proposed project.

Sincerely,

Carlos Swonke, P.G.
Environmental Affairs Division Director

cc: Ms. Stacey Benningfield, TxDOT, Austin District
Mr. Wes Buford, Central Texas Regional Mobility Authority

SH 45SW Participating Agencies Recipients List

Colonel Charles H. Klinge, Jr. Commander, Fort Worth District U.S. Army Corps of Engineers P.O. Box 17300 Fort Worth, TX 76102	W.F. "Kirk" Holland, P.G. Chief Operating Officer, General Manager Barton Springs/Edwards Aquifer Conservation District 1124 Regal Row Austin, TX 78748
Maureen McCoy Director Capital Area Metropolitan Planning Organization P.O. Box 1088 Austin, TX 78767	Todd Hemingson, AICP Vice President Capital Metropolitan Transportation Authority – Strategic Planning & Development Attn: Planning Department 2910 E 5th Street Austin, TX 78702
Robert J. Spillar, P.E. Director City of Austin – Transportation Department 505 Barton Springs Road Austin, TX 78704	Mike Personett Assistant Director City of Austin – Watershed Protection Department 505 Barton Springs Road Austin, TX 78704
Kevin Shunk, P.E. Supervising Engineer FEMA – City of Austin Floodplain Management City of Austin Watershed Protection 505 Barton Springs Road Austin, TX 78704	Rhonda Smith Compliance Assurance & Enforcement Division Office of Planning & Coordination, Region 6 U.S. Environmental Protection Agency 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733
Bert Cobb, M.D. – County Judge Hays County Hays County Courthouse 111 E San Antonio Street, Suite 300 San Marcos, TX 78666	Steven M. Manilla, P.E. County Executive Travis County Transportation & Natural Resources Department P.O. Box 1748 Austin, TX 78767
Rebecca S. Motal General Manager/CEO Lower Colorado River Authority 3700 Lake Austin Boulevard P.O. Box 220 Austin, TX 78767	Zak Covar Executive Director Texas Commission on Environmental Quality P.O. Box 13087 Austin, TX 78711
Mark Wolfe State Historic Preservation Officer Texas Historical Commission P.O. Box 12276 Austin, TX 78711	Carter Smith Executive Director Texas Parks and Wildlife Department 4200 Smith School Road Austin, TX 78744

SH 45SW Participating Agencies Recipients List

Darren LeBlanc Transportation Liaison U.S. Fish and Wildlife Service Texas Ecological Services Administrator's Office c/o Austin Ecological Services Field Office 10711 Burnet Road, Suite 200 Austin, TX 78758	Vanessa Sanchez Fish and Wildlife Biologist U.S. Fish and Wildlife Service Region 2 P.O. Box 1306 Albuquerque, NM 87103
Bryant J. Celestine Historic Preservation Officer Alabama-Coushatta Tribe of Texas 571 State Park Road 56 Livingston, TX 77351	Donnie Cabaniss Chairman Apache Tribe of Oklahoma P.O. Box 1220 Anadarko, OK 73005
Robert Cast THPO Caddo Nation of Oklahoma P.O. Box 487 Binger, OK 73009	Jimmy Arterberry THPO Comanche Nation Office of Historic Preservation P.O. Box 908 Lawton, OK 73502
Amie Tah-Bone Kiowa Indian Tribe of Oklahoma P.O. Box 369 Carnegie, OK 73015	Frederick Chino, Sr. President Mescalero Apache Tribe c/o Holly Houghton, THPO P.O. Box 227 Mescalero, NM 88340
Don Patterson President Tonkawa Tribe of Indians of Oklahoma 1 Rush Buffalo Road Tonkawa, OK 74653	Terri Parton President Wichita and Affiliated Tribes P.O. Box 729 Anadarko, OK 73005

City of Austin
City Manager's Office
P. O. Box 1088, Austin, TX 78767
(512) 974-2200, Fax (512) 974-2833

Marc A. Ott, *City Manager*
Marc.Ott@ci.austin.tx.us

June 27, 2012

Mr. Carlos Lopez, P.E.
Austin District Engineer
Texas Department of Transportation
7901 North Interstate Highway 35
Austin, Texas 78753
Mailing: P.O. Drawer 15426
Austin, Texas 78761-5426

RE: State Highway 45 Southwest (SH45 SW) Federal environmental review

Dear Mr. Lopez:

As you may be aware, the Austin City Council recently adopted "Imagine Austin", our city's comprehensive plan. In doing so, Council directed staff to remove the proposed State Highway 45 Southwest (SH45 SW) from said plan and to also request that CAMPO remove it from the regional transportation plan. In accordance with that directive, we are processing a request for a plan amendment to be submitted to CAMPO.

That being said, we also know that the upcoming Federal environmental review of the proposed project is ongoing. On behalf of the City of Austin (City), I request that the City be afforded the opportunity to participate directly and actively as a partnering agency in this review. Our active participation in the environmental review process is essential to ensuring that the City's policies and priorities for both transportation planning and environmental protection are fully considered and balanced with the needs for improved mobility.

The City of Austin has a long and sometimes controversial history of active participation in issues related to the proposed SH45 SW project. Mobility is recognized as a major concern by the residents and businesses of Austin and the future sustainability of our region depends on a diverse range of travel options, including complete roadway networks serving the movement of people, goods and services. The City therefore stands ready to assist with the careful and thorough evaluation of the SH45 SW project through the Federal environmental review process p rescribed by the National Environmental Policy Act (NEPA). This includes full evaluation of alternatives, such as alternative alignments, improvements to existing roadways, and the "no build" alternative.

The City of Austin is committed to compliance with the Americans with Disabilities Act.
Reasonable modifications and equal access to communications will be provided upon request.

In addition to mobility, the NEPA process must also give particular attention to the environmental sensitivity of the area, particularly the potential for adverse impacts to water supply and water quality in the Barton Springs Zone of the Edwards Aquifer and to federally-protected species in the area of the proposed roadway and at Barton Springs. For more than two decades the City of Austin, with broad community support, has enacted policies and has made significant investments in the protection of water quality in the Barton Springs Zone. Specific issues of concern to the City include potential impacts on the quality and quantity of recharge to the Barton Springs Zone of the Edwards Aquifer; on public water supply; to federally-protected endangered species at Barton Springs; and to Flint Ridge Cave, which is protected under the federal permit associated with the Balcones Canyonlands Conservation Plan.

We are pleased to learn that the Federal environmental review process for the proposed SH45 SW will take a fresh look at the need for the project and alternatives, including a robust "no build" scenario. Attached with this letter is a list of identified transportation and environmental challenges associated with the proposed project. We encourage TxDOT to make every effort to solicit public input on the scope of the EIS, as well as the results of EIS scientific findings. The City of Austin stands ready to assist and participate in the study process. I look forward to your response and to strengthening the City's relationship with your agency through the careful consideration and evaluation of the proposed transportation corridor. If you have questions, please contact Mike Personett at 974.2652 who will serve as our environmental lead for this project or Robert Spillar at 974.2488 who serves as our lead transportation professional for the City.

Sincerely,

Marc A. Ott
City Manager

Attachment: Transportation and Environmental Challenges Associated with the Proposed State Highway 45 Southwest, August 8, 2011.

cc: Sue Edwards, Assistant City Manager
Robert Goode, Assistant City Manager

Transportation and Environmental Challenges Associated with the Proposed State Highway 45 Southwest

Nico Hauwert, Ph.D., PG, Hydrogeologist
City of Austin Watershed Protection Department

William A. Conrad, Division Manager
City of Austin Wildland Conservation Division
Austin Water Utility

Gordon Derr, P.E.
Assistant Director
City of Austin Transportation Department

August 8, 2011

Transportation Challenges

The City of Austin has a long and sometimes controversial history of active participation in issues related to the proposed SH45 SW project. Mobility is recognized as a major concern by the residents and businesses of Austin and the future sustainability of our region depends on a diverse range of travel options, including complete roadway networks serving the movement of people, goods and services. Incomplete roadway networks contribute to regional traffic congestion and increase mobile sources of air pollution. The SH45 SW project may provide significant improvement in east-west mobility in the area and alternatives to provide this service through existing roadways may be problematic. For this reason, the City encourages TxDOT to consider the regional consequences of building the highway, as well as not building it, from a balanced mobility and environmental standpoint.

The Capital Metropolitan Planning Organization (CAMPO) is the regional body that is charged with making regional transportation decisions and for coordinating transportation investments among agencies in five Central Texas counties. CAMPO also plays a direct role in the distribution of Federal Highway Administration funds within the region. The CAMPO Policy Board, which has City of Austin voting representation, recently adopted the 2035 Regional Transportation Plan to guide transportation planning and investment throughout the region. The CAMPO 2035 Plan includes two "self-discipline" provisions that state:

1. "For a CAMPO member jurisdiction to receive federal-aid funding under this plan, their local transportation plan or the transportation element of their comprehensive plan must be consistent with the CAMPO Long Range Plan.

2. For a CAMPO member jurisdiction to receive federal-aid funding under this plan, the jurisdiction must adhere to the policies of and work toward implementing the projects of the CAMPO long range plan."

Importantly, the 2035 Plan calls for preparation of an environmental assessment for an extension of SH45 SW from the southern terminus of MoPac to IH-35. Funding for the environmental assessment and potential construction of the portion from MoPac to FM 1626 is programmed in

the 2035 Plan. However, for the segment from FM 1626 to IH-35, funding is programmed only for the environmental assessment and for design studies.

Environmental Challenges

For more than two decades the City of Austin, with broad community support, has enacted policies and made significant investments in the protection of water quality in the Barton Springs Zone of the Edwards Aquifer. Measures taken include:

- Implementation of the citizen-initiated Save Our Springs ordinance, which limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites in the Barton Springs Zone;
- Negotiation of various development agreements to achieve the intent of the SOS ordinance;
- Investment of $143 million in voter-approved bonds (to date) in the acquisition and preservation of 27,000 acres of land in the recharge and contributing zones; and
- Commitment, both legally and financially, to protect rare and endangered species pursuant to two permits issued under the Federal Endangered Species Act.

The City of Austin's Watershed Protection Department (WPD) and Austin Water Utility (AWU) Wildland Conservation Division staff have engaged in previous discussions about the development of SH45 SW. These include review of proposed TxDOT highway alignments and designs, identification and evaluation of critical environmental features in proximity to proposed alignments, identification of advanced stormwater quality controls, and evaluation of prior environmental impact assessments. Of particular concern are the potential impacts of the project, both during construction and in its operation, on both water quantity and water quality in Barton Springs Zone. Secondary development and associated impacts may potentially occur in portions of the recharge zone as a result of easier access through SH45 SW. Current scientific understanding of the hydrogeology of the Barton Springs Zone underscores these concerns, which are discussed further below.

Recharge to Barton Springs

Studies have demonstrated that a high percentage of rainfall in the area of the proposed SH45 SW directly recharges the Edwards Aquifer (Hauwert, 2009). Roughly two-thirds of the 8,300-foot segment from Mopac South to Bear Creek crosses internal drainage sinkhole basins that supply recharge to the Edwards Aquifer. There are fourteen identified caves within one-quarter of a mile of the proposed designated right-of-way (ROW). The density of major recharge features (caves and large sinkholes) is about 10 per square mile, one of the highest densities found in the recharge zone. The main channel of Bear Creek downstream of SH45 drainage contains swallets (creek-channel sinkholes) that directly recharge the aquifer in the range of 10 to 20 cubic feet per second when Bear Creek is flowing. These swallets are prone to plugging by fine-grained sediment, which reduces recharge and may be irreversible.

Proximity to Local Public and Private Water Supply Wells

The Barton Springs Zone of the Edwards Aquifer is a designated sole source aquifer under the Federal Safe Drinking Water Act. The proposed State Highway 45 Southwest (SH45 SW) is within the City's Drinking Water Protection Zone, not the Desired Development Zone. There are numerous public and private water supply well systems that lie downgradient of SH 45 SW. Contaminated stormwater runoff has the potential to impact drinking water supplies in portions of Shady Hollow, Copper Hills, SW Territory, and Marbridge Foundation (see attached map of well recovery from 2007 dye tracing). Of note is that the Edwards Aquifer is understood to provide little natural attenuation of contaminants, except by dilution with natural runoff sources (Hauwert, 2009).

Proximity to BCCP Protected Cave

The Balcones Canyonlands Preserve system (BCP) was established by the City of Austin and Travis County to protect various rare, threatened, and endangered species. The BCP holds an 'incidental take" permit under the Federal Endangered Species Act. By providing species protection on preserve lands, land development in other areas is possible without site-specific incidental take permits.

One of the sinkhole basins that the SH45 ROW bisects is the 70-acre catchment area for Flint Ridge Cave. The SH 45 SW ROW passes within 150 feet of the cave entrance and passes over portions of the subsurface extent of the cave (Hauwert et al., 2010; see attached map of Flint Ridge surface catchment). The cave provides habitat for rare troglobitic karst invertebrates including *Circurina cueva* and *Rhadine austinica*, both of which are listed as species of concern (SOC) under the City's Balcones Canyonlands Conservation Plan (BCCP) permit. Potentially other SOC have been observed in Flint Ridge Cave during faunal surveys, including *Eidmannella reclusa* and *Speodesmus N. S.*, although further biological investigation is necessary to distinguish the specific species present in the cave. One major goal of the BCCP is to adequately protect the habitat for these rare cave species thus negating the need for listing as endangered. If the BCCP is unable to protect these species then future listing by USFWS is a possibility. The City and Travis County could also incur fines under the Endangered Species Act for failure to protect this cave habitat and the permit itself may need to be amended, which could have implications for development city-wide.

Endangered Species Protection at Barton Springs

The City of Austin also holds an incidental take permit from the U.S. Fish and Wildlife Service (USFWS) for the endangered Barton Springs Salamander (*Eurycea sosorum*). It is expected that the Austin Blind Salamander (*Eurycea waterlooensis*), which like the Barton Springs Salamander is found only at Barton Springs, will also be listed as endangered. Dye tracer studies in the vicinity of the SH45 SW alignment have demonstrated a strong hydraulic connection with Barton Springs. Four groundwater tracers injected around Highway 45 and Mopac South in 2007 initially arrived at Barton Springs within two to four days. Long-term monitoring indicates that there has been some decline in water quality in the Barton Springs Zone (Mahler et al., 2006; Herrington et al., 2010; Mahler et al., 2011).

Non-Degradation Water Quality Controls

City of Austin staff requested by correspondence (Heitz, 2001 and 2005 meeting summary link below) that TxDOT commit to non-degradation standards for water quality for SH45 SW, and to

consult with City staff in defining nondegradation standards and water quality protection measures for the project. Working with TxDOT, advanced stormwater controls were determined to be capable of removing 94 percent of the estimated pollutant load that would be discharged offsite from the proposed roadway. TxDOT responded that it will implement only those sediment removal standards that are required by the Texas Commission on Environmental Quality (TCEQ) and that some other party (e.g., the City of Austin) would need to fund the incremental costs of more advanced treatment, including additional land acquisition outside the right-of-way (Nyland, 2007).

It should be noted that the USFWS has developed "Recommendations for Protection of Water Quality of the Edwards Aquifer" that are adopted by reference for SH45 SW in the Austin Metropolitan Area Transportation Plan (AMATP) 2025 Plan (link below). These measures have not yet been considered in the design or cost estimates for the project.

Monitoring, Assessment, and Adaptive Management

Because of the environmental sensitivity of the SH45 SW alignment, ongoing monitoring and assessment will be necessary to ensure protection of federal permit caves, Water Quality Protection Lands, nearby water wells and creeks, and Barton Springs. The Environmental Impact Statement (EIS) for SH45 SW, which was issued in 1989, is out of date and some impact assessments performed at that time were scientifically flawed. TxDOT consultants also performed studies in 2006 to assess the potential impacts of the highway. The methodology used in studies released thus far was also insufficient and no technical review by qualified stakeholders was solicited.

TxDOT is currently working with consultants to begin a new EIS compliant with federal laws. Because the scope of the EIS is uncertain, the City of Austin may be required to make considerable investment in studies, monitoring, water-quality treatment, and restoration projects commensurate with the sensitivity of the project area. The City and the Barton Springs/Edwards aquifer Conservation District (BS/EACD) have conducted assessments of most of the City WQPL adjacent to SH45 SW to locate recharge features, although additional evaluation of the most promising features, such as trash/debris excavation and subsurface mapping, still remains. Additionally, under the BCCP permit the USFWS would require that permit holders conduct a hydrogeological study of water sources to Flint Ridge Cave to demonstrate whether or not the project will affect cave habitat. This generally requires surface tracing to the cave drips and direct measurement of soil attenuation of pollutants. Additional biological studies are necessary to better understand and monitor cave species. Flow and water quality stations may also be necessary on Bear Creek upstream and downstream of SH45 SW crossing to monitor discharge quality and to suggest adaptive management changes to the roadway cross section, design details, construction methods, or water quality controls. In addition, this monitoring may help detect if recharge within the creek channel becomes blocked from roadway construction sediment signaling the need for adaptations in water resource management protection measures.

Labor, funding, and equipment may be necessary to regularly remove sediment discharged from SH45 (particularly during the construction phase) and to maintain creek recharge volume. If creek recharge impairment is permanent and significant features cannot be unplugged or bypassed, it may be possible to acquire and restore/enhance the recharge of upstream reaches or other creeks in order to offset the lost recharge to the aquifer. Flow and water quality monitoring of Flint Ridge Cave will need to continue through the life of the highway operation. If TxDOT does not participate significantly in the costs of these studies, water-quality treatment, and restoration, the

City of Austin, Travis County, and the Barton Springs/Edwards Aquifer Conservation District (BS/EACD) will need to commit resources to address this need.

Summary

The current proposed alignment of the highway "threads the needle" between impacts to Bear Creek and the federally-protected Flint Ridge Cave. While development of any major roadway will alter the natural landscape, it is technically feasible to avoid, minimize, and mitigate impacts in a manner consistent with a goal of non-degradation. This will require a thorough evaluation of potential adverse impacts, alignment, adoption of innovative highway design concepts to avoid, minimize, and mitigate impacts, use of advanced stormwater quality controls to achieve a non-degradation standard, and an adaptive management strategy to address observed impacts during construction and afterward. If necessary to the environmental protection of the SH45 SW area, we would potentially be willing to discuss financial participation in this project, if directed to do so by the City Council.

Meeting the current and future transportation needs of southern Travis and northern Hays poses significant challenges, not the least of which is development and operation of new roadways in an environmentally sensitive area. Completion of SH45 SW is one alternative available to help meet that challenge. The City supports use of the NEPA process as a tool to provide decision-makers with a balanced evaluation of the potential benefits, costs, and impacts of SH45 SW and its alternatives. And the City expects to be a full partner, along with other entities in the region, in the federal environmental review process. In addition to evaluating the potential benefits and impacts of the project as currently envisioned, the City supports a thorough evaluation of alternatives to the project. This includes alternative alignments, improvements to existing roadways, and the "no build" alternative. Projected mobility and air quality impacts of each alternative should be fully considered.

References and Additional Information:

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City of Austin and TxDOT Meeting summary, 2005, 3 p.
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2025 Austin Metropolitan Area Transportation Plan (AMATP) table:
ftp://ftp.ci.austin.tx.us/GIS-Data/planning/amatp/table.pdf

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http://www.ci.austin.tx.us/watershed/publications/files/Tabor%20guidebookfinal20100519.pdf

Hauwert, Nico M., 2009, Groundwater Flow and Recharge within the Barton Springs Segment of the Edwards Aquifer, Southern Travis County and Northern Hays Counties, Texas: Ph.D. Diss., University of Texas at Austin, Texas. 328 p.
http://www.ci.austin.tx.us/watershed/publications/files/FinalDissertationNH2009710.pdf.

Herrington, Chris and Hiers, Scott, 2010, Temporal Trend Analysis of Long-term Monitoring Data at Karst Springs, 2009: City of Austin Watershed protection Dept. SR-10-06, 43 p. http://www.ci.austin.tx.us/watershed/publications/files/SR-10-06%20Karst%20Springs%20Temporal%2020091.pdf

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Mahler, B.J., Garner, B.D., Musgrove, M., Guilfoyle, A.L., and Rao, M.V., 2006, Recent (2003–05) water quality of Barton Springs, Austin, Texas, with emphasis on factors affecting variability: U.S. Geological Survey Scientific Investigations Report 2006–5299, 83 p., 5 appendixes. http://pubs.usgs.gov/sir/2006/5299/

Mahler, B.J., Musgrove, M., Herrington, C., and Sample, T.L., 2011, Recent (2008–10) concentrations and isotopic compositions of nitrate and concentrations of wastewater compounds in the Barton Springs zone, south-central Texas, and their potential relation to urban development in the contributing zone: U.S. Geological Survey Scientific Investigations Report 2011–5018, 39 p. http://pubs.usgs.gov/sir/2011/5018/

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http://www.ci.austin.tx.us/watershed/publications/files/Nyland2007SH%2045%20Coordination%20Response200703.pdf

TRANSPORTATION AND NATURAL RESOURCES
STEVEN M. MANILLA, P.E., COUNTY EXECUTIVE

700 Lavaca Street
5th Floor
P.O. Box 1748
Austin, Texas 78767
(512) 854-9383
FAX (512) 854-9436

July 1, 2013

Mr. Carlos Swonke, P.G.
Director, Environmental Affairs Division
Texas Department of Transportation
125 E 11th Street
Austin, TX 78701-2483

Re: SH45 Southwest From State Loop 1 (MoPac) to Farm-to-Market 1626
Notice of Intent to Prepare EIS

Dear Mr. Swonke:

With respect to the above referenced Notice of Intent to prepare an environmental impact statement for the SH45 SW project published in the Texas Register on June 21, 2013, please include in your distribution lists the following contacts for Travis County Transportation and Natural Resources Department:

Steven M. Manilla, P.E., County Executive
Transportation & Natural Resources Department
P.O. Box 1748
Austin, Texas 78767
(512) 854-9383
Steven.Manilla@co.travis.tx.us

Jon A. White, Environmental Officer
Transportation & Natural Resources Department
P.O. Box 1748
Austin, Texas 78767
(512) 854-7212
jon.white@co.travis.tx.us

We look forward to actively participating in the environmental evaluation of this important project.

Sincerely,

Steven M. Manilla, P.E.
County Executive
Transportation and Natural Resources Department
Travis County

cc: Jon White - TNR

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Office of the Hays County Judge

Bert Cobb, M.D.
111 E. San Antonio St., Suite 300 • San Marcos, Texas 78666

July 9, 2013

Carlos Swonke
Environmental Affairs Division Director
Texas Department of Transportation
Dewitt C. Greer State Highway Building
125 E. 11th Street
Austin, Texas 78701

Mr. Swonke,

I have received you letter regarding the proposed project to extend SH 45 Southwest from MoPac to FM 1626. Hays County would appreciate the opportunity to participate in this process.

Please include Commissioner Mark Jones on any correspondence regarding this project.

Commissioner Mark Jones
Hays County Precinct 2 Commissioner
PO Box 1180
Kyle, Texas 78640

Commissioner Jones is aware of July 31st meeting and plans to attend. Please let us know if you require additional information.

Best regards,

Bert Cobb, M.D.
Hays County Judge

cc: Commissioner Mark Jones
Mr. Doug Booher-TxDOT

STATE OF TEXAS §
§ **RESOLUTION #071113-01**
COUNTIES OF CALDWELL, §
HAYS, AND TRAVIS §

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BARTON SPRINGS / EDWARDS AQUIFER CONSERVATION DISTRICT TO PARTICIPATE IN PREPARATION OF THE EIS FOR SH 45 SOUTHWEST

WHEREAS, the Barton Springs Edwards Aquifer Conservation District (the "District") is a groundwater conservation district given the statutory objectives to conserve, protect, and recharge the groundwater resources of the District, including the Barton Springs segment of the Edwards Aquifer, which is a designated sole-source aquifer according to the federal Safe Drinking Water Act and the drinking water supply for more than 70,000 people;

WHEREAS, the proposed State Highway 45 Southwest ("SH-45 SW") transects the recharge zone of the Barton Springs Edwards Aquifer (the "Aquifer") in an area known to have a high concentration of aquifer recharge features, and the Aquifer provides little natural attenuation of pollutants that enter it from the surface of the ground, and there are numerous public and private water supply wells downgradient from the SH-45 SW right-of way that could be adversely affected by contaminated runoff from the roadway, both during construction and after completion;

WHEREAS, the Aquifer's natural outlets at Barton Springs are used for contact recreation by more than 500,000 people a year and are the sole habitat of the Barton Springs salamander, a listed endangered species under the Endangered Species Act that is known to be sensitive to the degradation of water quality;

WHEREAS, on January 25, 1990, a Consent Decree and Partial Final Judgment (the "Consent Decree") was signed in Civil Action No. 89-CA-719 in the United States District Court for the Western District of Texas, styled Save Barton Creek Association et al. and Barton Springs Edwards Aquifer Conservation District vs. Federal Highway Administration et al. and MoPac South Corporation (the "lawsuit"), in which the District and the Texas State Department of Highways and Public Transportation, now named the Texas Department of Transportation ("TxDOT"), agreed to be bound by certain terms and conditions ordered by the Court to allow the construction of SH-45 SW to continue and ensure that it is constructed in an environmentally sensitive and prudent manner;

WHEREAS, the Consent Decree is still in effect and binding on the District and TxDOT for the alignment, design, and construction of SH-45 SW:

WHEREAS, TxDOT has recently published notice that the environmental impact statement ("EIS") for SH-45 SW between MoPac Expressway South and FM 1626 will be prepared

according to state requirements (38 TexReg 4051, June 21, 2013) and that the EIS will consider surface water and groundwater impacts, among others; and

WHEREAS, consistent with the Consent Decree, TxDOT has invited the District to be a Participating Agency with TxDOT in the development of the EIS, without either supporting or opposing the construction of SH-45 SW, and specifically to identify any issues of concern regarding the project's potential environmental or socioeconomic impacts, provide input on determining alternatives, participate in coordination meetings and joint field reviews, and review and comment on draft environmental documents:

THEREFORE, the District accepts the invitation to become a Participating Agency with TxDOT in the preparation of the EIS for SH-45 SW between MoPac Expressway South and FM 1626 and any extension thereof, including –

All of the tasks mentioned in the letter to the District, dated July 2, 2013, from Carlos Swonke, P.G., Environmental Affairs Division Director of TxDOT;

Taking part in a reasonable on-the-ground survey of the right-of-way for significant recharge features and exercising all of the other rights of notice and comment provided for in the Consent Decree.

Participating in the Agency Scoping Meeting scheduled on July 31, 2013 and the public scoping meeting / open house tentatively scheduled for mid-August.

Providing review and comment on the draft Coordination Plan to insure that the process provides opportunity for consideration of all scientific studies, roadway design and alignment options, and best available engineering practices and controls to prevent degradation of the quality of recharge to the Edwards Aquifer.

The District's General Manager or his designee will represent the District in its participation in the EIS.

In Favor 4 Opposed 0

PASSED AND APPROVED THIS 11th DAY OF JULY, 2013.

Mary Stone, President

ATTEST:

Craig Smith, Secretary

City of Austin

July 12, 2013

Mr. Carlos Swonke, P.G.
Environmental Affairs Division Director
Texas Department of Transportation
125 East 11th Street
Austin, TX 78701

RE: State Highway 45 Southwest Environmental Review

Dear Carlos:

As requested, I am responding to your letter of 2 July 2013 inviting the City of Austin Watershed Protection Department to become a "Participating Agency" in the environmental review of the proposed State Highway 45 project. I greatly appreciate the invitation and want to affirm the City's keen interest in and commitment to participating actively in the development of an Environmental Impact Statement for the project.

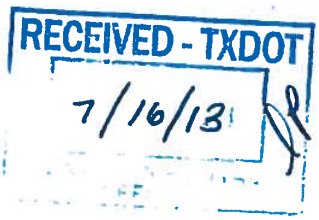
For your records, in a letter dated 27 June 2013 from Austin City Manager, Marc A. Ott (attached), the City expressed its concerns about potential adverse environmental impacts associated with the proposed project and expressed the City's interest in participating in what was then anticipated to be a Federal process under the National Environmental Policy Act (NEPA). Please note that the City Manager designated two primary points of contact for the City – Rob Spillar, Director of the Austin Transportation Department as the lead for the mobility issues and myself as the lead for the environmental issues. In addition to the Austin Transportation Department and the Watershed Protection Department, the City will also be represented by William Conrad, Manager of the Austin Water Utility Wildlands Division. As you are no doubt aware, the City has significant land holdings adjacent to and in proximity to the proposed project and together with Travis County is responsible for protection of certain natural resources pursuant to a Federal permit for the Balcones Canyonlands Conservation Plan (BCCP). Mr. Conrad is the City's lead for the management of those lands and for the BCCP permit.

Again we appreciate the invitation to participate directly in the environmental review process for this proposed project and I personally look forward to working with you again.

Sincerely,

Michael A. Personett

Mike Personett, Assistant Director
Watershed Protect Department



Attachment

CC: Robert Goode, Assistant City Manager, City of Austin
Sue Edwards, Assistant City Manager, City of Austin
Victoria J. Li, P.E., Director, Watershed Protection Department
Rob Spillar, P.E., Director, Austin Transportation Department
Greg Meszaros, Director, Austin Water Utility
William Conrad, Manager, Wildlands Division, Austin Water Utility

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Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

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ENVIRONMENTAL AFFAIRS

July 15, 2013

Mr. Doug Booher
TxDOT – Environmental Affairs Division
125 E. 11th Street
Austin, TX 78701

RE: Proposed project to extend SH 45 Southwest from State Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626 in Travis and Hays Counties, Texas

Dear Mr. Booher:

Texas Parks and Wildlife Department (TPWD) received the invitation to become a participating agency with the Texas Department of Transportation (TxDOT) in conjunction with the Central Texas Regional Mobility Authority (CTRMA) in the development of the Environmental Impact Statement (EIS) for the above-referenced project. TPWD welcomes the opportunity to provide input during the preparation of the EIS and accepts the invitation to become a Participating Agency.

This office can provide preliminary information pertaining to potential issues of concern regarding fish and wildlife resources within the study area. This information would assist TxDOT in the development of alternatives and the focus of the analysis.

Please contact me at (512) 389-8054 or Jessica.schmerler@tpwd.texas.gov if we may be of further assistance. I look forward to working with TxDOT on the development of this EIS.

Sincerely,

Jessica E. Schmerler
Wildlife Habitat Assessment Program
Wildlife Division

JES:gg.ERCS-6854

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

CAPITAL METROPOLITAN TRANSPORTATION AUTHORITY
2910 East Fifth Street, Austin, Texas 78702 | TEL 512.389.7400 | FAX 512.369.6596 | www.capmetro.org

July 16, 2013

Mr. Carlos Swonke
Texas Department of Transportation
Dewitt C. Greer State Highway Bldg.
125 E. 11th Street
Austin, TX 78701-2483
(512) 463.8585

Dear Mr. Swonke:

Capital Metro has received and reviewed your request regarding your invitation to become a Participating Agency on the proposed Texas Department of Transportation (TxDOT) Project.

In response to your letter Capital Metro is pleased to accept your invitation in becoming a Participating Agency with TxDOT in the development of the EIS for the subject project.

We are committed to working closely with you and your agency, Texas Department of Transportation (TxDOT) during this project.

If you have questions or need additional information, please let me know. I can be contacted at 369.6036 or via email at todd.hemingson@capmetro.org

Capital Metropolitan Transportation Authority
Attn: Planning Department
2910 East 5th Street
Austin, Texas 78702

Sincerely,

Todd Hemingson, AICP
Vice-President Strategic Planning & Development
Capital Metro

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JUL 17 2013
ENVIRONMENTAL AFFAIRS

TONKAWA TRIBE OF OKLAHOMA

NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT

• 1 RUSH BUFFALO ROAD, TONKAWA, OKLAHOMA 74653 •
• PHONE (580) 628-2561 • FAX: (580) 628-9903 •
WEB SITE: www.tonkawatribe.com

Dear Sir or Madam,

Regarding your proposed projects, the Tonkawa Tribe of Indians of Oklahoma submits the following:

The Tonkawa Tribe has no specifically designated historical or cultural sites identified in the above listed project area. However if any human remains, funerary objects, or other evidence of historical or cultural significance is inadvertently discovered then the Tonkawa Tribe would certainly be interested in proper disposition thereof.

We appreciate notification by your office of the many projects on-going, and as always the Tonkawa Tribe is willing to work with your representatives in any manner to uphold the provisions of NAGPRA to the extent of our capability.

Respectfully,

Miranda “Nax’ce” Myer
NAGPRA Representative

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Post Office Box 1306
Albuquerque, New Mexico 87103

In Reply Refer To:
FWS/R2/ES-HC/055132

JUL 23 2013

Mr. Doug Booher
Texas Department of Transportation
Environmental Affairs Division
125 East 11th Street
Austin, Texas 78701

Dear Mr. Booher:

By letter received July 2, 2013, you requested the participation of the U.S. Fish and Wildlife Service (Service) as a cooperating agency in the development and review of the National Environmental Policy Act (NEPA) process for the State Highway 45 southwest from State Loop 1 (MoPac) to Farm-to-Market Road 1626 Environmental Impact Statement (EIS). This letter confirms our interest in being a cooperating agency in the development of the proposed EIS. We would also invite the opportunity to develop a mutually agreeable Memorandum of Understanding (MOU) to formalize our specific roles and responsibilities.

The Service appreciates the opportunity to be a cooperating agency for this NEPA process. Our assistance will include analyzing effects of various proposed alternatives, identifying potential significant issues and developing alternatives as they pertain to our mission of working with the Texas Department of Transportation (TxDOT), in conjunction with the Central Texas Regional Mobility Authority (CTRMA). Pursuant to the mission of the Service, our assistance as a cooperating agency will be directed to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. Our cooperation will be consistent with respective authorities of the Endangered Species Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, the Cooperative Agreement between TxDOT, Federal Highway Administration, and the Service, and other appropriate laws and administrative guidance pertinent to the Department of the Interior.

As requested, our list of primary contacts for this project includes:

Darren LeBlanc
Texas Transportation Liaison
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, Texas 78758
512-490-0057 ext. 247
darren_leblanc@fws.gov

Vanessa Burge
Regional NEPA/Transportation Coordinator
Fish and Wildlife Biologist
500 Gold SW, Room 6018
Albuquerque, New Mexico 87102
505-248-6420
vanessa_burge@fws.gov

We look forward to cooperatively developing a MOU for this work. Collaboration on the proposed EIS is an opportunity for the Service to assist TxDOT in conjunction with CTRMA, in ensuring conservation of fish, wildlife, and their habitats while meeting project objectives. If you have any questions, please contact Darren LeBlanc, Texas Transportation, Liaison, Austin Ecological Services Field Office, at 512-490-0057, Extension 247, who is the primary contact for this project.

Sincerely,

ACTING Joy E Nicholopoulos

Regional Director

cc: Texas Transportation Liaison, Austin Ecological Service Field Office, Austin, TX
Chief, Migratory Bird Office, Region 2, Albuquerque, NM
Field Supervisor, Austin Ecological Services Field Office, Austin, TX
Field Supervisor, Clear Lake Ecological Services Field Office, Clear Lake, TX

From: Linda Henderson [mailto:Linda.Henderson@thc.state.tx.us]
Sent: Monday, July 29, 2013 5:26 PM
To: Doug Booher
Cc: Mark Denton
Subject: invitation to SHPO for participation in SH 45 extension

Doug,

I'm writing to let you know that Mark Denton and I have reviewed the invitation for THC to participate in the development of an EIS for the extension of SH 45 in the southwestern Travis and northern Hays counties. We will participate and also look forward to working with TxDOT and others involved through Section 106 coordination if there are any federal permits, licenses, or funds associated with the project. Please let us know if you need anything else from our office at this time.

Best,

Linda

Linda Henderson
Historian, Federal Programs
History Programs Division
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276
phone: 512/463-5851
www.thc.state.tx.us

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August 1, 2013

Name
Title
Organization
Address
City, State Zip Code

Re: Information Request for the Proposed State Highway 45 Southwest Project

Sent via email: email address

Dear Name:

The Texas Department of Transportation (TxDOT), in conjunction with the Central Texas Regional Mobility Authority, is preparing an environmental impact statement for the proposed SH 45SW project. A map of the study area is enclosed with this letter. We would appreciate any information your agency may have that may be relevant to the development of the SH 4SW project.

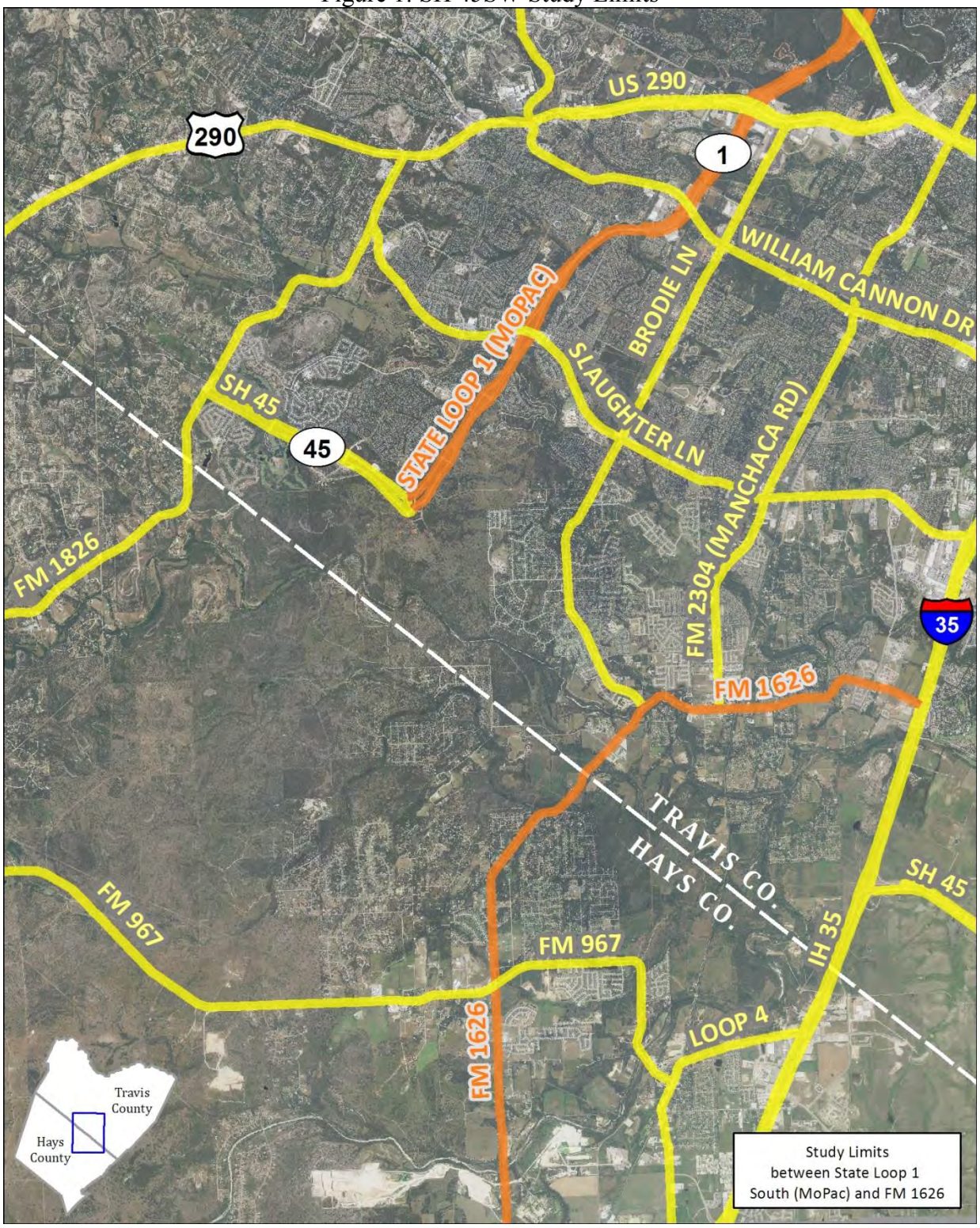
Please provide the requested information at your earliest convenience along with contact information for an appropriate point of contact with your agency. If you need further information from us to complete this request, please contact Doug Booher at Doug.Booher@Txdot.gov or by phone at (512) 416-2663.

Sincerely,

Carlos Swonke, P.G.
Director, Environmental Affairs Division

Enclosure

Figure 1: SH 45SW Study Limits



SH 45SW Agency Data Request Recipients List

Colonel Charles H. Klinge, Jr. Commander, Fort Worth District U.S. Army Corps of Engineers P.O. Box 17300 Fort Worth, TX 76102	W.F. "Kirk" Holland, P.G. Chief Operating Officer, General Manager Barton Springs/Edwards Aquifer Conservation District 1124 Regal Row Austin, TX 78748
Maureen McCoy Director Capital Area Metropolitan Planning Organization P.O. Box 1088 Austin, TX 78767	Todd Hemingson, AICP Vice President Capital Metropolitan Transportation Authority – Strategic Planning & Development Attn: Planning Department 2910 E 5th Street Austin, TX 78702
Robert J. Spillar, P.E. Director City of Austin – Transportation Department 505 Barton Springs Road Austin, TX 78704	Mike Personett Assistant Director City of Austin – Watershed Protection Department 505 Barton Springs Road Austin, TX 78704
Jon A. White Environmental Officer Travis County Transportation and Natural Resources Department P.O. Box 1748 Austin, TX 78767	Rhonda Smith Compliance Assurance & Enforcement Division Office of Planning & Coordination, Region 6 U.S. Environmental Protection Agency 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733
Bert Cobb, M.D. – County Judge Hays County Hays County Courthouse 111 E San Antonio Street, Suite 300 San Marcos, TX 78666	Steven M. Manilla, P.E. County Executive Travis County Transportation & Natural Resources Department P.O. Box 1748 Austin, TX 78767
Rebecca S. Motal General Manager/CEO Lower Colorado River Authority 3700 Lake Austin Boulevard P.O. Box 220 Austin, TX 78767	Zak Covar Executive Director Texas Commission on Environmental Quality P.O. Box 13087 Austin, TX 78711
Mark Wolfe State Historic Preservation Officer Texas Historical Commission P.O. Box 12276 Austin, TX 78711	Carter Smith Executive Director Texas Parks and Wildlife Department 4200 Smith School Road Austin, TX 78744

SH 45SW Agency Data Request Recipients List

Darren LeBlanc Transportation Liaison U.S. Fish and Wildlife Service Texas Ecological Services Administrator's Office c/o Austin Ecological Services Field Office 10711 Burnet Road, Suite 200 Austin, TX 78758	Vanessa Sanchez Fish and Wildlife Biologist U.S. Fish and Wildlife Service Region 2 P.O. Box 1306 Albuquerque, NM 87103
Mark Denton Program Coordinator Archeology Division Texas Historical Commission P.O. Box 12276 Austin, TX 78711	Linda Henderson Historian, Federal Programs History Programs Division Texas Historical Commission P.O. Box 12276 Austin, TX 78711
Jessica E. Schmerler Wildlife Habitat Assessment Program Texas Parks and Wildlife Department 4200 Smith School Road Austin, TX 78744	David Van Soest Regional Director Texas Commission on Environmental Quality MC R11 P.O. Box 13087 Austin, TX 78711
Commissioner Mark Jones Hays County Precinct 2 P.O. Box 1180 Kyle, TX 78640	

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

September 18, 2003

RE: Section 106 Consultation: Archeological Survey of the SH 45 Extension Project from Loop 1 to RM 1626, Travis and Hays Counties, Texas: TAC Permit No. 3146
CSJ: 1200-06-004

James E. Bruseth, Ph.D.
Division of Archeology
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Dr. Bruseth:

In accord with the Programmatic Agreement (PA) among TxDOT, Federal Highways Administration, the Advisory Council on Historic Preservation, and the Texas Historical Commission (THC), and the Memorandum of Understanding (MOU) between TxDOT and THC we are initiating Section 106 and Antiquities Code consultation for the proposed undertaking.

This project consists of constructing approximately 3.4 miles of a new, six-lane highway between Loop 1 and RM 1626 in Travis and Hays Counties. The proposed 300 foot wide right-of-way will be located on mostly new location and encompasses 124 acres. The THC issued TAC Permit No. 3146 to Archeological and Cultural Sciences Group (ACSG) to conduct an archeological survey in the proposed project area.

Between June 9 and 26, 2003, staff from ACSG conducted the field investigation for the project area. The investigation resulted in the identification of six archeological sites (41TV1049, 41TV1050, 41TV1051, 41TV1052, 41TV1053, and 41TV1424) in or near the proposed project area. ACSG determined that 41TV1049, 41TV1050, 41TV1053, and 41TV1424 are all located out of the proposed right-of-way and will not be impacted by the project. ASCG determined that 41TV1051 is located within the proposed right-of-way and would be impacted by the project. ACSG also determined that due to extensive overlap, 41TV1052 should be considered as the prehistoric component of 41TV1051.

ASCG has concluded that 41TV1051 is comprised of two discreet historic components as well as the above mentioned prehistoric component (formally 41TV1052). The prehistoric component consists of a sparse lithic scatter with no observed features, diagnostics, or subsurface deposition. ACSG have recommended that this prehistoric component is not significant. One of the two historic components consists of an early to mid 20th Century ranch complex located mostly out of the project's area of potential effect. ACSG have recommended that the portion of this ranch complex extending into the project is also not significant. The other historic component is

comprised of a discreet homestead complex that may have constituents dating to the mid 19th Century. In addition, this component may be associated with John G. McGeehee, an early colonist. This homestead complex is located within the proposed right-of-way and would be impacted by the project. ACSG has recommended further work in the form of National Register of Historic Places (NRHP) eligibility testing for this portion of 41TV1051. The ACSG report is attached for your review.

Based upon their findings, TxDOT agrees with the ACSG recommendations and therefore seeks THC concurrence for the following:

1. 41TV1049, 41TV1050, 41TV1053, and 41TV1424 are all located outside of the proposed project area and will not be impacted. However, if the proposed project parameters change to incorporate these site areas, additional work is required to determine these sites' significance and potential impacts associated with the proposed project.
2. The above mentioned 20th Century ranch component and the prehistoric component (formally 41TV1052) of 41TV1051 are not eligible for listing on the NRHP or warrant designation as State Archeological Landmarks.
3. NRHP eligibility testing is appropriate for the described historical homestead component of 41TV1051 located within the proposed right-of-way.
4. The archeological resource inventory of the proposed project is complete and with the exception of the described historical homestead component of 41TV1051, there are no historic archeological properties located within the proposed project.
5. Except for the described historical homestead component of 41TV1051, no further archeological work or THC consultation is required for the proposed project.
6. Construction may proceed in the proposed project area except in the recorded 41TV1051 site area.

In the event that potentially significant archeological materials are discovered during construction in the project areas recommended for no further archeological work or THC consultation, construction in the immediate area shall cease, and TxDOT archeological personnel will contact your office to initiate accidental discovery procedures in accordance of the terms of the PA. Thank you for your consideration in this matter. If you require additional information regarding these projects, please contact me at (512) 416-2640.

Sincerely,

Jon Budd, Staff Archeologist
Archeological Studies Program
Environmental Affairs Division

Concurrence by; _____ 9-18-03
For F. Lawerence Oaks, State Historic Preservation Officer and Executive Director — Date

Attachment
cc w/o attachment: S. Nash -ACSG, M. Walker -Austin District, ENV- JP, OL – Reading File, JHB, AJM

Jon Budd - ARCH

9-8-09

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

August 31, 2009

RE: TxDOT Transmittal of Notification of Completion of Data Recovery Fieldwork Conducted for 41TV1051 (also known as the Ransom Williams Farmstead) located within the SH 45 SW Project in Travis County, CSJ: 1200-06-004
TAC Permit Number 4736

James E. Bruseth, Ph.D.
Division of Archeology, Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Dr. Bruseth:

This correspondence continues Section 106 consultation and Texas Antiquities Code coordination for site 41TV1051, a historic African American Farmstead identified within the right-of-way of the SH 45 south west (SW) undertaking in South Travis County. This consultation and coordination has been conducted in accord with the terms of the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer (TSHPO), and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings, as well as the Memorandum of Understanding between the Texas State Historic Preservation Officer and TxDOT.

The THC issued TAC Permit No. 4736 to Prewitt and Associates, Inc., (PAI) to conduct data recovery for the portion of 41TV1051 overlapping onto the SH 45SW roadway construction area of potential effects (APE). The TSHPO previously concurred with recommendations of National Register of Historic Places eligibility under criterion d as well as State Archeological Landmark eligibility for 41TV1051. This portion of 41TV1051 will be removed during roadway construction.

PAI conducted data recovery from June 6, 2009 to August 28, 2009. PAI has submitted an interim report documenting that their investigations have conformed to the TSHPO approved scope of work. A copy of the PAI interim report is attached for your review.

Based upon the details in the PAI report, it is TxDOT's opinion that the data potential for the portion of 41TV1051 overlapping onto the APE has been exhausted. TxDOT shall coordinate the final, complete data recovery report with the THC when it becomes available.

TxDOT seeks THC concurrence that data recovery fieldwork is complete for the portion of 41TV1051 overlapping onto the APE for the SH 45 SW construction project and construction may commence. Please signify your concurrence by signing on the signature block listed below. Thank you for your consideration in this matter. If you require additional information regarding this project, please contact me at (512) 416-2640.

Sincerely,

Jon Budd, TxDOT Staff Archeologist

Concurrence by: _____ Date: 9-3-09
For Mark Wolfe, State Historic Preservation Officer and Executive Director
Attachments
cc w/o attachments: AUS - M. Walker, ENV-JAR, JHB, Reading File

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April 24, 2014

Antiquities Code of Texas: No historic properties present (no NRHP-listed or SAL-designated properties present in ROW)

Travis and Hays counties (Austin District)
RE: SH 45 SOUTHWEST FROM STATE LOOP 1 (MoPAC) TO FM 1626
CSJ#: 1200-06-004

Mrs. Linda Henderson, History Programs Division
Texas Historical Commission
Austin, Texas 78711

Dear Mrs. Henderson:

The Texas Department of Transportation (TxDOT) and Central Texas Regional Mobility Authority (CTRMA) propose to construct a new-location road section extending State Highway (SH) 45 from State Loop 1 (MoPAC) to Farm to Market (FM) 1626. The roadway would be a four-lane, divided toll road approximately four miles long with 12-foot-wide lanes. From FM 1626 to Bear Creek, the roadway would have 10-foot-wide outside shoulders and four-foot-wide inside shoulders. From Bear Creek to MoPac, the roadway would be undivided, with 10-foot-wide outside shoulders and nine-foot-wide inside shoulders. A 10-foot-wide shared use path would parallel the roadway. The proposed roadway would provide connections to four existing roadways. No federal permits are anticipated at this time. Approximately 309 acres would be converted to transportation uses.

Because this undertaking will employ state and local funds for these efforts (no federal funding is required for the project), this letter summarizes our historical studies consultation efforts per the Memorandum of Understanding (MOU) between our agencies as specified by Texas Administrative Code Rule §2.24. Please note our consultation regarding archeological properties was handled separately with your Division of Archeology.

A review of the National Register of Historic Places (NRHP), the list of State Antiquities Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that **no** historically significant resources have been previously documented within the area of potential effects (APE). It has been determined through consultation with the State Historic Preservation Officer (SHPO) that the APE is the footprint of the proposed project. See attached maps, schematics, screen shot of the THC Atlas, and photos.

We request your concurrence with this finding of "No historic properties present" in the APE per the terms of the MOU. Please return a signed copy of this correspondence for our files within 20 days. Thank you for your cooperation in this review process. If you have any questions or comments concerning these evaluations, please call me at (512) 416-2600.

Sincerely,

Mark M. Brown, PhD
Architectural Historian
Environmental Affairs Division

CONCUR-
Memorandum of Understanding - Antiquities Code of Texas

NO HISTORIC PROPERTIES PRESENT

NAME: _____ DATE: 5 May 2014
for Mark Wolfe, Texas Historical Commission

Initials: _____
Bruce Jensen, Supervisor Historical Studies Branch

cc w attachments: ECOS
cc: Mike Walker, Austin District

SCANNED
9/2/14 lp

Texas Department of Transportation®
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

August 28, 2014

RE: Transmittal of TxDOT Intensive Survey Report for SH 45 SW Additional Areas: Austin District: Travis and Hays Counties: CSJ: 1200-06-004
Texas Antiquities Permit No. 6907

Patricia A. Mercado-Allinger
Division Director/State Archeologist
Archeology Division
Texas Historical Commission
PO Box 12276
Austin, TX 78711-2276

Dear Ms. Mercado-Allinger:

In accord with the Memorandum of Understanding (MOU) between the Texas State Historic Preservation Officer and TxDOT, we are continuing Antiquities Code of Texas consultation for the proposed undertaking.

This undertaking is entitled as State Highway 45 Southwest (SH 45 SW). It proposes to construct a new roadway on mostly new location beginning at the existing intersection of SH 45 and MoPac (also known as Loop 1) and extending approximately 3.1 miles southeast to the existing FM 1626 right of way (ROW). From FM 1626 proceeding north to Bear Creek the proposed roadway would consist of two 12 foot wide travel lanes with 4 and 10 foot wide shoulders in either direction separated by a 64 foot wide median. From Bear Creek continuing north to Mopac, the roadway would consist of two 12 foot wide travel lanes with 9 and 10 foot wide shoulders in each direction with no median. This construction would include a bridge over Bear Creek as well as an overpass over Bliss Spillar Road. Smaller cross drainage structures will also be installed into new locations. Tie-ins at the Mopac, SH 45, and FM 1626 intersections would also be constructed. Drainage retention ponds will be constructed at select areas. All work would be limited to the right of way (ROW) that is owned by the State of Texas. No new ROW or easements are required. However, approximately 164.6 acres of the proposed project are located on new location for the proposed SH 45 SW ROW and approximately 6.43 acres of new location are required for the proposed Bliss Spillar Roadway intersection with SH 45 SW.

Antiquities Code of Texas consultation for this project has been previously conducted. On September 19, 2003, your office concurred with the following TxDOT recommendations:

1. The archeological sites identified as 41TV1049, 41TV1050, 41TV1053, and 41TV1424 area all located out of the project area and will not be impacted.
2. The 20th Century ranch component and the prehistoric component of site 41TV1051 are insignificant and are not contributing elements to the historic property status of 41TV1051.
3. Significance testing is warranted for the late 19th Century homestead component of site 41TV1051.

4. The archeological site inventory of the proposed project is complete and with the exception of the late 19th Century homestead component of site 41TV1051, there are no historic properties located within the proposed project.
5. Except for the late 19th Century homestead component of site 41TV1051, no further work or Texas Historic Commission (THC) consultation is required for the proposed project.
6. Construction may proceed in the proposed project area except in the recorded 41TV1051 site area.

Please note that since the 2003 consultation letter, the late 19th Century component of 41TV1051 was determined to be significant. TxDOT and the THC found that the project would have an adverse effect to a State Antiquities Landmark. Date recovery was recommended and has since been conducted. On September 3, 2009, the THC concurred with TxDOT recommendations that the field work for data recovery was complete and that construction could commence within the site area (please attached letter dated August 31, 2009).

In the 2003 consultation letter, the undertaking's area of potential effects (APE) was defined as a 300 foot wide corridor beginning at Loop 1 and extending south approximately 3.4 miles to FM 1626 for a total of 124 acres. TxDOT also committed to additional analysis in the event that the project parameters changed. A copy of that letter dated September 19, 2003 is attached to this letter.

Since the 2003 consultation, the project design has changed to include an additional 185.09 acres. The APE has been redefined as the 300 to 750 foot wide proposed SH 45 SW ROW beginning at the existing intersection of SH 45 and MoPac (Loop 1) and extending approximately 17,500 feet (3.1 miles) southwest to FM 1626. The APE also includes the proposed intersections of SH 45 SW with SH 45, MoPac (Loop1), Bliss Spillar Road, and FM 1626. The overall archeological APE for the proposed project is approximately 33,520 linear feet in length with a typical width of 300 to 400 feet, though the width expands to a maximum of 750 feet wide at interchanges. Based on typical roadway design, the APE extends approximately two to three feet below ground surface for roadway construction, up to 10 feet below ground surface for culverts, and 20 to 30 feet below ground surface for bridge support columns and retention ponds. The redefined APE is comprised of a total of 309.09 acres. Please see attached schematics for development details.

Based upon the change in project design, TxDOT recommended additional assessment of the newly defined project area. Your office issued Texas Antiquities Permit N. 6907 to TxDOT to conduct an intensive archeological survey of the 185.09 acres added to the APE since the 2003 consultation.

TxDOT has recently concluded the assessment of these 185.09 acres. Based upon previous surveys, TxDOT recommends that no survey or additional work is required for the 135.94 acres comprising the portions of the APE containing the SH 45, MoPac (also known as Loop 1), and FM 1626 ROWs. Subtracting these 135.94 acres that have been previously surveyed from the 185.09 acres that have been added to the project area since the 2003 consultation, leaves a total of approximately 49.15 acres of additional areas have not been previously assessed.

Based upon the upland setting and locations upon geology and sediments that possess formation periods predating the generally accepted arrival time of human beings into Travis and Hays Counties (12,000 years ago), TxDOT recommends that survey and no further work is warranted for approximately 38.27 acres of the 49.15 acres of the APE that have not been previously surveyed. Archeological remains if any would be limited near to or on the existing ground surface with minimal potential for the presence of naturally deeply buried intact archeological deposits. Any archeological artifacts, features, faunal, and or floral remains would have likely been crushed, broken, weathered, eroded, mixed, and pushed out of any original depositional context making it extremely difficult if not impossible for them to yield information important to history or prehistory. In addition, no historic residences were illustrated on the attached 1896 15 Minute USGS Topographic Quadrangle map in or adjacent to the APE.

Pedestrian survey was conducted by TxDOT within the remaining 10.88 of the 49.15 acres the APE that had been recommended for further assessment. These acres are illustrated on the map figure labeled as the SH 45 SW Additional Areas imbedded in the attached report. These 10.88 acres were recommended for survey by TxDOT because 6.43 acres were located on new location for the proposed Bliss Spillar Road intersection with SH 45 SW. A total of five shovel tests were excavated into this area. In addition, approximately 2.29 acres were located near the previously recorded location of the historic site labeled as 41TV1049. TxDOT sought to confirm that this late 19th Century archeological site was not within the APE. TxDOT confirmed that it wasn't. These 2.29 acres were comprised of a 50 foot wide swath beginning at the Old Bliss Spillar Road and extending 2,000 feet north along the east side of the proposed SH 45 SW ROW. Finally, the 2.16 acres of the existing Bliss Spillar Road ROW was inspected to confirm the absence of 41HT177 within the APE. TxDOT confirmed that 41HY177 is not within the APE and confirmed is located approximately 20 meters north beyond the Bliss Spillar northern ROW limits. No archeological sites were identified during the intensive archeological survey conducted by TxDOT in the 10.88 acres.

The current assessment identified a total of eight previously recorded archeological sites located within 100 meters of the expanded APE. TxDOT recommends that no further field work is recommended for five (41TV1050, 41TV1052, 41TV1424, 41TV1540, and 41TV2238). These five sites are all considered to be upland chert lithic quarries where prehistoric inhabitants tested and utilized the naturally occurring chert resources abundant in the area. These sites have minimal subsurface components, a lack of features, and temporal diagnostics (such as projectile points or radiocarbon assays). They are also located on very ancient geology and sediments with formation periods predating the generally accepted arrival time of human beings into Travis and Hays Counties (12,000 years ago). Therefore, archeological remains would be limited to near or on the existing ground surface with minimal potential for the presence of naturally deeply buried intact archeological deposits. Any archeological artifacts, features, faunal, and or floral remains would have likely been crushed, broken, weathered, eroded, mixed, and pushed out of any original depositional context making it extremely difficult if not impossible for them to yield information important to history or prehistory. TxDOT recommends that no additional work or survey is warranted for these sites.

Despite intensive archeological survey under the current investigation, no evidence was observed within the APE of sites 41HY177 and 41TV1049. Therefore, TxDOT recommends that no portions of these two sites are within the current APE and therefore will not be impacted by the undertaking.

All fieldwork associated with the data recovery for 41TV1051 has been completed under Texas Antiquities Permit No. 4736 (Prewitt and Associates). No additional fieldwork is recommended. The only further work is the completion of the final report. A copy of the letter dated August 31, 2009 with the THC endorsement stipulating that the data recovery fieldwork for 41TV1051 is complete is attached to this letter. A copy of the current TxDOT intensive archeological survey report is also attached to this letter.

Based upon the information provided above as well as in the attached TxDOT intensive archeological survey report, TxDOT seeks THC concurrence for the following:

1. Any portions of the prehistoric archeological sites 41TV1050, 41TV1052, 41TV1424, 41TV1540, and 41TV2238 located within the APE are not historic properties and do not warrant status as State Antiquities Landmarks.
2. The historical archeological sites 41HY177 and 41TV1049 do not overlap onto the APE.
3. The inventory of the current APE is complete.
4. For a finding of an adverse effect to one historic archeological site (41TV1051).
5. That the adverse effect to 41TV1051 has been mitigated through sufficient data recovery.
6. That no further work, survey, significance testing, or data recovery is required.
7. That no further consultation with the THC is required.
8. That construction may commence in the APE.

Please signify your concurrence by signing on the signature line provided below. If you have any questions, please contact me at 416-2640. Thank you for your consideration in this matter.

In the event that archeological materials are discovered during construction, construction in the immediate area shall cease, and the THC will be contacted to initiate accidental discovery procedures in accordance of the terms of the MOU.

Sincerely,
Jon Budd
Jon Budd, TxDOT Staff Archeologist

Concurrence by: _____ Date: 8-28-14
For Mark Wolfe, State Historic Preservation Officer and Executive Director

Attachments
cc w/o attachments: Austin District Office, ATTN: S. Benningfield, ENV- JHB

MEMORANDUM

Texas Department of Transportation

TO: 850 File, Recommendation for No Survey Warranted: SH 45 SW 2.56 Additional Areas: Austin District: Travis and Hays Counties: CSJ: 1200-06-004

Re: No Effect

FROM: Jon Budd Staff Archeologist **DATE:** December 11, 2014

SUBJECT: Internal review under the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation (TxDOT), the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the Memorandum of Understanding (MOU) between the Texas State Historic Preservation Officer and TxDOT.

This undertaking entitled as State Highway 45 Southwest (SH 45 SW) would use state and local funds only to construct a new roadway on mostly new location beginning at MoPac and extending approximately 3.1 miles southeast to the existing FM 1626. The proposed roadway would consist of two 12 foot wide travel lanes with 4 and 10 foot wide shoulders in either direction separated by a 64 foot wide median. However in some areas the roadway would consist of only two 12 foot wide travel lanes with 9 and 10 foot wide shoulders in each direction with no median. This construction would include a bridge over Bear Creek as well as an overpass over Bliss Spillar Road. Smaller cross drainage structures will also be installed into new locations. Tie-ins at the MoPac, SH 45, and FM 1626 intersections would also be constructed. Drainage retention ponds will be constructed at select areas. All work would be limited to the right of way (ROW) that is owned by the State of Texas. No new ROW or easements are required. However, approximately 168 acres of the proposed project are located on new location for the proposed SH 45 SW ROW and approximately 6.43 acres of new location are required for the proposed Bliss Spillar Roadway intersection with SH 45 SW. In accordance with the terms of the MOU; we are initiating documentation for internal review of this project.

This undertaking has been previously coordinated with the Texas State Historic Preservation Officer (TSHPO) multiple times. The TSHPO concurred with TxDOT recommendations for a finding of an adverse effect to a State Antiquities Landmark for one archeological site, 41TV1051, the Ransom Williams Farmstead. 41TV1051 was subject to data recovery and the site area was cleared for construction. The TSHPO concurred that the adverse effect was mitigated, that the inventory of the APE was complete, and that no further work was required for the entire undertaking. The TSHPO also concurred that construction may commence (please see the attached THC endorsed TxDOT letter dated August 28, 2014 for more details).

Since the last consultation with the TSHPO, the project design has changed to incorporate an additional 2.56 acres. These 2.56 acres are located in two separate areas located on either side of the previously coordinated SH 45 SW roadway straddling Bear Creek (please see attached map figure entitled SH 45 SW 2.56 Acres of Additional APE for more

details). The area on the west side consists of 1.35 acres and measures 1,375 feet long and mostly 50 feet wide. The area on the east side consists of 1.25 acres and measures 1,300 feet long and is also mostly 50 feet wide.

Since the project design has changed to include these additional 2.56 acres, The undertaking's area of potential effects (APE) has now been redefined as the 300 to 750 foot wide proposed SH 45 SW ROW beginning at the existing intersection of SH 45 and MoPac (Loop 1) and extending approximately 17,500 feet (3.1 miles) southwest to FM 1626. The APE also includes the proposed intersections of SH 45 SW with SH 45, MoPac (Loop1), Bliss Spillar Road, and FM 1626. The overall archeological APE for the proposed project is approximately 33,520 linear feet in length with a typical width of 300 to 400 feet, though the width expands to a maximum of 750 feet wide at interchanges. Based on typical roadway design, the APE extends approximately two to three feet below ground surface for roadway construction, up to 10 feet below ground surface for culverts, and 20 to 30 feet below ground surface for bridge support columns and retention ponds. The redefined APE is comprised of a total of 311.65 acres.

According to the attached Austin Sheet of the Geologic Atlas of Texas, the geology underlying the 2.56 acres of additional APE is comprised of Pleistocene aged Fluviatile Deposits (Qo). According to the attached USDA/SCS Soil Survey of Travis County, the sediments underlying these 2.56 acres are comprised of mostly Speck stony clay loam, 1 to 5% slopes (SsC) and to a much lesser extent inside the Bear Creek Channel, Mixed alluvial land, 0 to 1% slopes, frequently flooded (Md).

The Qo and ScC possess formation periods predating the generally accepted arrival time of human beings into Travis County (12,000 years ago). Therefore these sediments and geologic formations possess minimal potential for the presence of naturally buried intact archeological deposits. Archeological deposits, if any would be limited to the ground surface and subject to erosion, weathering, mixing, and overprinting from subsequent human occupations. The Md sediments are limited to the very narrow channel of Bear Creek and although much more recent in time, they are subject to routine scouring from upstream fluvial events. Archeological deposits, if any would likely have been transported from upstream and re-deposited and not in any original in-situ depositional context. If would be very difficult if not impossible for any archeological artifacts or features located on or within any of these geologic/sedimentary settings to yield information important to prehistory or history.

As outlined in the attached August 28, 2014 consultation letter with the TSHPO, there have been multiple intensive archeological surveys, one testing investigation, and one data recovery investigation conducted in the original SH 45 SW APE (please see attached TxDOT letter dated August 28, 2014 for details). This includes the 2003 survey conducted under Texas Antiquities Permit No. 3146 that assessed the original 300 foot wide SH 45 SW ROW located immediately adjacent to the 2.56 acres recently added to the APE. Since the 2.56 acres measure 50 feet (15.25 meters) in width, these new areas can be considered as within the accepted 20 meter transect width for intensive surveys.

According to the attached Oak Hill quad (3097-224) of the Texas Archeological Sites Atlas, there are four archeological sites (41TV606, 41TV1050, 41TV1051, and 41TV1424) located within 1 kilometer of the 2.56 acres recently added to the APE. However, 41TV606 and 41TV1051 are located more than 100 meters away from the 2.56 acres and will not be impacted. Portions of both 41TV1050 and 41TV1424 likely overlap onto the 2.56 acres. However, both of these sites have been recorded as upland lithic quarries with no diagnostic

artifacts, features, faunal, or floral remains. Both sites are also situated on Speck stony clay loam, 1 to 5% slopes (ScC). As mentioned above, ScC possesses minimal potential for the presence of buried intact archeological deposits. Archeological deposits, if any would be limited to the ground surface and subject to erosion, weathering, mixing, and overprinting from subsequent human occupations making it extremely difficult if not impossible for any archeological artifacts or features to yield information important to prehistory or history. In addition, the portions of these sites overlapping onto the original APE were previously determined by the TSHPO not to be contributing elements to these sites' eligibility for listing as State Antiquities Landmarks (SALs) (please see attached letter date August 28, 2014). Based upon these observations, it is TxDOT's opinion that the portions of the archeological sites 41TV1050 and 41TV1424 overlapping onto the 2.56 acres recently added to the APE do not warrant status as SALs and no further work is warranted.

According to the attached 1896 Austin 15" USGS topographic Map, there were no residences or buildings located in or near the 2.56 acres recently added to the APE in 1896. There are also no known cemeteries in or near these 2.56 acres.

Based upon the information provided above, TxDOT recommends that the addition of the 2.56 acres recently added to the APE do not change the previous findings and:

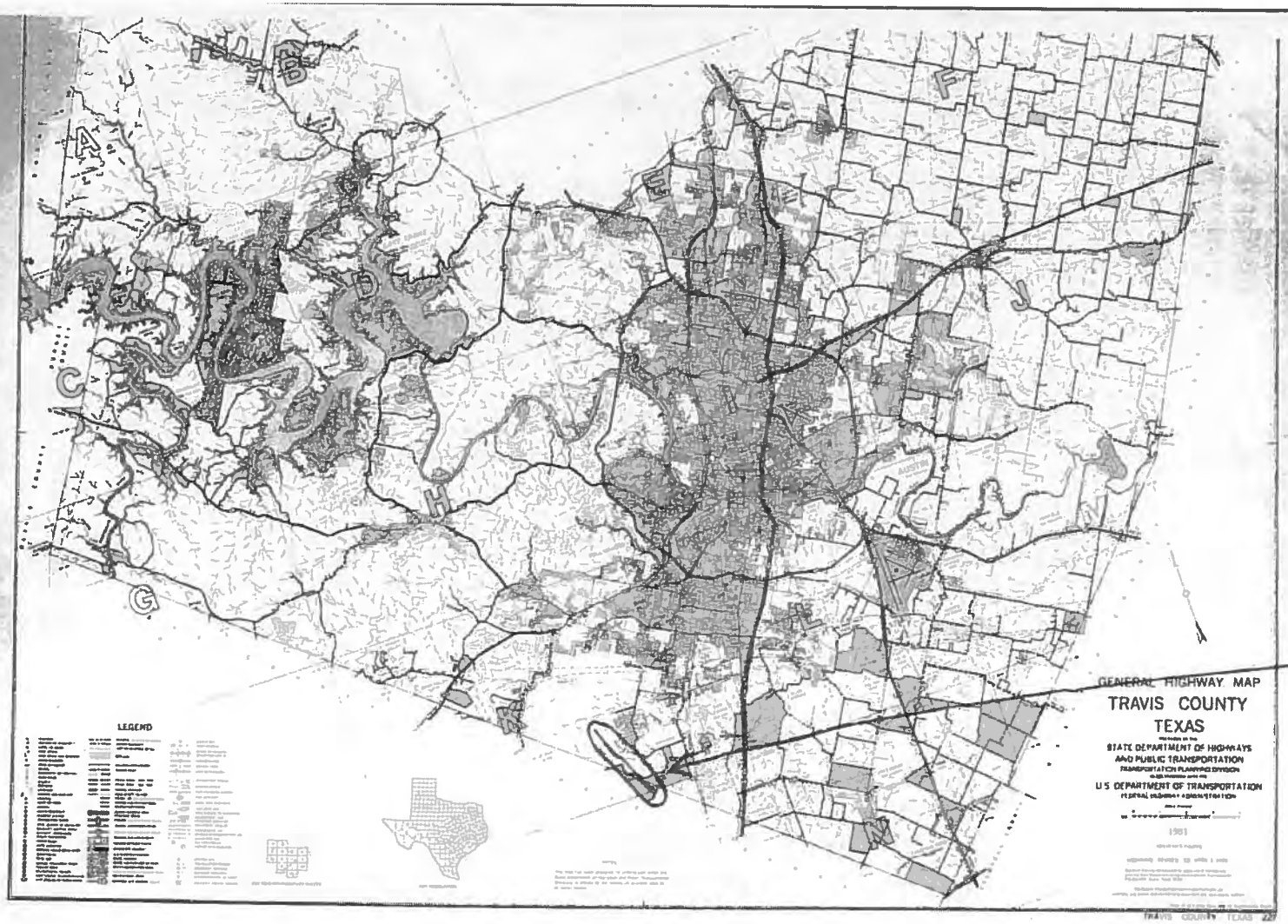
1. Any portions of the prehistoric archeological sites 41TV1050 and 41TV1424, located within the 311.65 acre APE do not warrant status as State Antiquities Landmarks.
2. The inventory of the current APE is complete.
3. That no further work, survey, significance testing, or data recovery is required.
4. That no further consultation with the THC is required.
5. That construction may commence in the APE.

Based on the upland nature of the proposed project area as well as shallow ancient sediments and fluvial disturbance, it is concluded that the addition of the 2.56 acres recently added to the APE would have "no effect". Thus, the area does not include settings with reasonable potential to contain State Antiquities Landmarks (13 TAC 26.12). No further archeological research is recommended and none is proposed.

In the event of the discovery of archeological remains during construction, work would cease in the immediate vicinity of the discovery and emergency discovery procedures would be initiated.

Approved by Scott Plum Date December 11, 2014
For FHWA and TxDOT

Attachments



TxDOT
Austin District
Travis County Hays County
SH45SW Additional Areas
CSJ: 1200-06-004
JBudd 6/3/2014

Project Area

TEXAS PARKS & WILDLIFE

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Fort Worth

Carter P. Smith
Executive Director

September 9, 2013

Mr. Doug Booher
Strategic Projects Manager
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483

RE: Texas Department of Transportation (TxDOT) information request for the proposed State Highway (SH) 45SW Project, Travis and Hays Counties, Texas

Dear Mr. Booher:

Texas Parks and Wildlife Department (TPWD) has received the information request for the above-referenced project located in Travis and Hays Counties. TPWD would like to offer the following information, comments, and recommendations to minimize impacts to fish and wildlife resources.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011, which can be found online at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. For tracking purposes, please refer to TPWD project number ERCS-7307 in any return correspondence regarding this project.

Project Description

TxDOT in conjunction with the Central Texas Regional Mobility Authority (CTRMA) is preparing an Environmental Impact Statement (EIS) for the proposed SH 45SW project. The proposed roadway project consists of the construction of SH 45SW from State Loop 1 (MoPac) to FM 1626 through Travis and Hays counties and will be on new location. The roadway is proposed to be a four-lane toll freeway between MoPac and FM 1626 and would be approximately 4 miles in length.

Impacts to Vegetation/Wildlife Habitat

Due to the fact that the project will be on new location, vegetation impacts are anticipated as a result of the proposed project.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

Recommendation: TPWD recommends clearing the least amount of vegetation possible for the construction of this project, especially undisturbed native vegetation and mature trees. TPWD recommends in-kind on-site replacement/restoration of the native vegetation wherever practicable. If on-site mitigation for tree removal is not practicable, TPWD recommends off-site mitigation for removed trees. There are several parks managed by the City of Austin and Travis County located adjacent to the project area that would be appropriate locations to mitigate for tree removal. Examples of nearby parks include Old San Antonio Park, Bauerle Ranch Park, Mary Moore Searight Park, Manchaca Gardens Park, as well as several others.

To minimize adverse effects, activities should be planned to preserve any mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation are high value to wildlife as food and cover. TPWD generally recommends that trees greater than 12-inches in diameter-at-breast-height (dbh) to be removed be replaced at a ratio of three trees for every one (3:1) lost to the extent practicable, either on-site or off-site. Trees less than 12-inches in dbh should be replaced at a 1:1 ratio. Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species. A three to five year maintenance plan that ensures an 85 percent survival rate should be developed for the replacement trees.

Onion Creek and several of its tributaries including Bear Creek and Little Bear Creek are located within the study area. There are also several wetlands and depressional wetland ponds within the study area. These water crossings and wetlands are shown on the attached Water Resources map.

Removal of vegetation along stream systems and wetlands can be damaging to fish and wildlife habitat and to natural processes associated with these systems. Vegetation associated with forested stream systems usually reflects wildlife habitats with the highest value. The degree of adverse impact to habitat resulting from this vegetation loss relates directly to the quantity of the vegetation loss and quality of the vegetation assemblage in fulfilling life requisites of those organisms using it.

Recommendation: Riparian vegetation associated with streams and wetlands acts as a natural buffer and should remain undisturbed to the extent feasible to help protect water quality and preserve wildlife cover, food sources, and travel corridors. TPWD recommends that TxDOT route the proposed project in an area that would have the lowest impact on water crossings and wetlands as well as associated riparian habitat. If wetland or

stream impacts cannot be avoided, TPWD requests that TxDOT mitigate for any wetland and stream impacts and prepare a wetland mitigation plan. The wetland mitigation plan should be developed in consultation with TPWD.

Water Resources (Edwards Aquifer)

The study area is located within the Edwards Aquifer Recharge Zone. The recharge zone is a 1,250 square mile area where highly faulted and fractured Edwards limestones outcrop at the land surface, allowing large quantities of water to flow into the aquifer. In the recharge zone there are no other rock formations overlying the Edwards, so it is exposed at the surface. The aquifer here is "unconfined" and has a water table that rises and falls in response to rainfall. Within the recharge zone, the aquifer is fed both from streams and from direct infiltration through karst limestone openings. These openings may be visible at the surface or hidden beneath thin soil coverings. Because there is little opportunity to capture released pollutants, and because of the hidden location and orientation of the subsurface conduits, the aquifer is even more vulnerable to pollution from activities on the recharge zone.

Recommendation: TPWD recommends TxDOT ensure that precipitation runoff, which could potentially carry pollutants, is intercepted and treated before reaching sensitive recharge features on and off the project site by installing storm water Best Management Practices (BMPs). TPWD recommends installing erosion and sediment control BMPs that would aide in construction stabilization. Erosion and sediment control measures include temporary or permanent seeding (with native plants), mulching, earth dikes, silt fences, sediment traps, and sediment basins. Examples of post-construction BMPs include vegetation systems (biofilters) such as grass filter strips and vegetated swales as well as retention basins capable of treating the additional runoff that would occur from the increase in impervious cover.

A Water Pollution Abatement Plan (WPAP) for the proposed project may be required by the Texas Commission on Environmental Quality (TCEQ). Additional information on WPAP requirements can be found at http://www.tceq.texas.gov/field/eapp/wpap.html or by contacting the TCEQ at eapp@tceq.texas.gov.

Ecologically Significant Stream Segment

The proposed project would cross tributaries of Onion Creek. Onion Creek is considered to be an Ecologically Significant Stream Segment (ESSS) from the

confluence with the Colorado River in Travis County to the most upstream crossing of FM 165 in Blanco County. The designation is based on:

- Riparian conservation area – McKinney Falls State Park
- High water quality
- Exceptional aquatic life
- High aesthetic value
- Diverse benthic macroinvertebrate community

TPWD has identified ESSSs throughout the state to assist regional water planning groups in identifying ecologically unique stream segments under Texas Administrative Code (TAC) Title 31 §357.43 and §357.8. Until approved by the legislature this is not a legal designation. The stream segments are identified through extensive review by TPWD staff and are determined to be ecologically important. Information regarding criteria for designation as an ESSS can be found on the TPWD website at http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_issues/sig segs/ or in 31 TAC 357.43 and 357.8.

Recommendation: As previously mentioned, TPWD recommends the project be designed to avoid adverse water quality impacts to Onion Creek and its tributaries.

Federal Laws

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Recommendation: If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends TxDOT survey the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. Any vegetation (trees, shrubs,

and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

Endangered Species Act

Federally-listed animal species and their habitats are protected from "take" on any property by the Endangered Species Act (ESA). Take of a federally-listed species can be allowed if it is "incidental" to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from take except on lands under federal/state jurisdiction or for which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from the USFWS is a violation of the ESA.

The Texas Natural Diversity Database (TXNDD) is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records; for questions regarding a record, please contact txndd@tpwd.texas.gov.

TXNDD records within and adjacent to the study area are shown on the attached map for your reference. Records on that map are labeled using their Element Occurrence Identification (EOID) number. That number corresponds to the EOID field on the attached TXNDD report.

Golden-cheeked Warbler (*Setophaga chrysoparia*) – Federally- and State-listed Endangered

There are two TXNDD occurrences for the Golden-cheeked Warbler (GCWA) within the study area. In addition to the known occurrences, review of a predictive habitat model for the GCWA (Diamond, et al. 2007. *Range-wide Modeling of Golden-cheeked Warbler Habitat.* Section 6 Project E-72-R, Final Report, Texas Parks and Wildlife Department, Austin, Texas) indicates that there is a high potential for suitable habitat for the GCWA within the

study area. A map denoting the areas containing potential habitat is attached for your reference.

Black-capped Vireo (*Vireo atricapilla*) – Federally- and State-listed Endangered

According to the TXNDD there is one occurrence of the federally- and state-listed endangered Black-capped Vireo (BCVI) located within the study area.

Recommendation: TPWD recommends TxDOT perform breeding season surveys for the GCWA and BCVI in areas containing suitable habitat that may be impacted as a result of the proposed project. Even if habitat for these species would not be directly impacted by vegetation removal, if nesting pairs are present in the surrounding vegetation they could be disrupted by noise and activity during construction. Because the definition of take in the ESA includes harming or harassing a listed species, this disturbance could constitute a violation of the ESA. TPWD recommends TXDOT conduct presence/absence surveys according to USFWS GCWA Survey Guidelines (http://www.fws.gov/southwest/es/AustinTexas/ESA_Sci_permits.html). The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for these federally-listed species.

Barton Springs salamander (*Eurycea sosorum*) – Federally- and State-listed Endangered

According to the TXNDD there is one occurrence of the federally and state-listed endangered Barton Springs salamander located within the study area.

Recommendation: TPWD recommends that that study area be surveyed for springs. If springs are present, TPWD recommends TxDOT perform a salamander survey. If protected salamanders are present on-site and would be adversely impacted by the proposed project, then TPWD and the USFWS should be contacted for guidance on protection of this species.

The project study area is predominantly located in Karst Zone 3 which includes areas having a low probability of containing suitable habitat for federally-listed karst invertebrate species.

Recommendations: The USFWS karst invertebrate survey requirements recommend on-the-ground surveys for projects located in Karst Zone 3 to determine if karst features containing endangered invertebrates are likely

to occur. The USFWS Section 10(a)(1)(A) Karst Invertebrate Survey Requirements Survey Protocol may be found at http://www.fws.gov/southwest/es/Documents/R2ES/Karst_Survey_Protocols_20110908.pdf. If not done to date, TPWD recommends that a karst feature survey be performed in accordance with USFWS karst survey protocols to determine if endangered cave invertebrate species may be present and affected by the project.

State Laws

State-listed Species

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for take (incidental or otherwise) of state-listed species. State-listed species may only be handled by persons with a scientific collection permit obtained through TPWD. For more information on this permit, please contact the Wildlife Permits Office at (512) 389-4647.

Based on a review of topographic maps and aerial photography of the project study area, it appears that Onion Creek and its tributaries may provide suitable habitat for freshwater mussels that may be present in Travis and Hays counties (listed below).

Creeper (squawfoot) (*Strophitus undulates*) – Rare species
False spike mussel (*Quadrula mitchelli*) – State-listed Threatened
Golden orb (*Quadrula aurea*) – State-listed Threatened*
Smooth pimpleback (*Quadrula houstonensis*) – State-listed Threatened*
Texas fatmucket (*Lampsilis bracteata*) – State-listed Threatened*
Texas fawnsfoot (*Truncilla macrodon*) – State-listed Threatened*
Texas pimpleback (*Quadrula petrina*) – State-listed Threatened*

*Federal Candidate for Listing

Recommendation: TPWD recommends TxDOT take measures to avoid impacts to aquatic and riparian habitats, which would minimize impacts to aquatic species including rare freshwater mussels. If suitable habitat for freshwater mussels would be directly or indirectly impacted by the proposed project, TPWD recommends TxDOT perform a mussel survey prior to construction. Surveys should include any part of the channel that would be directly disturbed by construction as well as areas that may be blanketed by fine sediments downstream. If native mussels are found in the potentially impacted areas, TPWD recommends TxDOT contact this

office regarding potential relocation of these species to an area that would not be disturbed by construction.

TPWD notes that under Parks and Wildlife Code Section 12.015, 12.019, 66.015 and TAC 57.251-.259, TPWD regulates the introduction and stocking of fish, shellfish, and aquatic plants into public waters of the state. Activities in state waters that involve dewatering or relocation of fish, mussels, or aquatic plants need to be conducted in conjunction with an Aquatic Resources Relocation Plan. Upon completion, such plans are submitted to the appropriate TPWD Inland Fisheries or Coastal Fisheries Kills and Spills Team (KAST) for review. The purpose of these plans is to ensure that native fish, aquatic plants, and mussels are being handled properly and protected from danger during dewatering and/or relocation activities. Accordingly, a permit to introduce shellfish, finfish, and aquatic plants into public waters will be issued once the Aquatic Resources Relocation Plan is finalized and approved by the KAST.

Recommendation: If dewatering activities, relocation of native fish or aquatic plants, or other activities that could result in take of aquatic species would be conducted, TPWD recommends TxDOT submit an Aquatic Resources Relocation Plan to Alan Butler, TPWD Region 1 KAST at alan.butler@tpwd.texas.gov to initiate coordination for a permit to introduce aquatic resources into public waters.

Recommendation: TPWD recommends that impact avoidance measures for all native freshwater mussel species, regardless of state-listing status, be considered during project planning and construction.

Texas horned lizard (*Phrynosoma cornutum*) – State-listed Threatened

The project study area may provide suitable habitat for the Texas horned lizard. If present in the study area, the Texas horned lizard could be impacted by ground disturbing activities from construction. Horned lizards may hibernate on site in the loose soils few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Horned lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If horned lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities.

Recommendation: TPWD recommends that a pre-construction survey be conducted to determine if horned lizards are present in the project study

area. A useful indication that the Texas horned lizard may occupy the site is the presence of Harvester Ant (*Pogonomyrmex barbatus*) nests since Harvester Ants are the primary food source of horned lizards. The survey should be performed during the warm months of the year when the horned lizards are active. Fact sheets, including survey protocols and photos of Texas horned lizard may be found online at http://www.tpwd.state.tx.us/learning/texas_nature_trackers/horned_lizard/ and at http://www.tpwd.state.tx.us/huntwild/wild/species/thlizard/.

If horned lizards are found on-site, TPWD recommends contacting this office to develop plans to relocate them, particularly if there is likelihood that they would be harmed by project activities. To minimize impacts to the Texas horned lizard, TPWD recommends the use of the BMPs described in the *Texas Horned Lizard Watch – Management and Monitoring Packet* which can be found online at http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0038.pdf and *Texas Tortoise Best Management Practices* which can be found online at http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/habitat_assessment/media/texas_tortoise_bmps.pdf. Please note that Texas tortoise BMPs are applicable to the Texas horned lizard.

Rare Species

In addition to state- and federally-protected species, TPWD tracks special features, natural communities, and rare resources that are not listed as threatened or endangered. These species and communities are tracked in the TXNDD, and TPWD actively promotes their conservation. TPWD considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment.

Based on the project description, site location, a review of the TXNDD, and publicly-available aerial photographs, the following rare species and natural community could be impacted as a result of the proposed project:

Texas garter snake (*Thamnophis sirtalis annectens*)

There are two TXNDD occurrences for the Texas garter snake located within the project study area.

Recommendation: Snakes are generally perceived as a threat and killed when encountered during clearing or construction. Therefore, TPWD recommends that personnel involved in clearing and construction be

informed of the potential for the rare Texas garter snake to occur on the project site. Personnel should be advised to avoid impacts to this snake as it is non-venomous and poses no threat to humans. Contractors should avoid contact with this species if encountered and allow the snake to safely leave the premises.

Spot-tailed earless lizard (*Holbrookia lacerata*)

There are three TXNDD occurrences for the Spot-tailed earless lizard located within the project study area.

In January 2010, the species of concern Spot-tailed earless lizard was petitioned for listing under the ESA. On May 24, 2011, the USFWS issued a 90-day finding on that petition. Based on their review, the USFWS found the petition presents substantial scientific or commercial information indicating that listing the Spot-tailed earless lizard may be warranted. The USFWS has therefore initiated a status review to determine if listing is in fact warranted. Based on this status review, the USFWS will issue a 12-month finding on the petition.

Recommendation: TPWD recommends TxDOT monitor the listing status of the Spot-tailed earless lizard throughout project planning and construction and perform required consultation, permitting, and mitigation with the USFWS if this species becomes listed under the ESA.

Plateau live oak/Little bluestem series (*Quercus fusiformis/Schizachyrium* series)

There is one TXNDD occurrence for the Plateau live oak/Little bluestem series (natural community) located within the project study area.

Recommendation: TPWD recommends that construction crews be informed about the possibility of finding and avoiding harm to wildlife and native vegetation, since this would provide the best benefit for wildlife conservation overall.

Recommendation: Please review the TPWD county lists of rare and protected species for Travis and Hays Counties, as rare species in addition to those discussed above could be present depending upon habitat availability. These lists are available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/.

TPWD strives to respond to requests for project review within the 45 day comment period. Responses may be delayed due to workload and lack of staff. Failure to meet the 45 day review timeframe does not constitute a concurrence from TPWD that the proposed project will not adversely impact fish and wildlife resources.

TPWD advises review and implementation of these recommendations. If you have any questions, please contact me at (512) 389-8054 or Jessica.Schmerler@tpwd.texas.gov.

Sincerely,

Jessica E. Schmerler
Wildlife Habitat Assessment Program
Wildlife Division

JES:gg.ERCS-7307

Attachments (3)

FEIS Distribution/Mailing List

Federal Agency	
U.S. Army Corps of Engineers (USACE)	Col. Charles H. Klinge, Jr. District Engineer and Commanding Officer Fort Worth District P.O. Box 17300 Fort Worth, TX 76102
U.S. Fish and Wildlife Service (USFWS), Region 2 Office	Dr. Benjamin Tuggle, Regional Director U.S. Fish and Wildlife Service Region 2 Office c/o Vanessa Burge 500 Gold Avenue SW, Rm # 6018 Albuquerque, New Mexico 87102
U.S. Fish and Wildlife Service (USFWS), Austin Ecological Services Field Office	Adam Zerrenner, Field Supervisor U.S. Fish and Wildlife Service, Austin Ecological Services Field Office 10711 Burnet Road Suite 200 Austin, TX 78758
U.S. Fish and Wildlife Service (USFWS)	Darren LeBlanc 10711 Burnet Road Suite 200 Austin, TX 78758
State Agency	
State Historic Preservation Officer (SHPO) - Texas Historical Commission	Mark Wolfe, Executive Director, Texas Historical Commission Attention: Linda Henderson & Mark Denton P.O. Box 12276 Austin, TX 78711-2276
Texas Commission on Environmental Quality (TCEQ)	Richard A. Hyde, P.E., Executive Director Attention: Lori Wilson P.O. Box 13087 Austin, TX 78711-3087
Texas Parks and Wildlife Department (TPWD)	Carter Smith, Executive Director 4200 Smith School Road Austin, TX 78744
Local Government	
Travis County, Transportation and Natural Resources Department	Steven M. Manilla, P.E. P.O. Box 1748 Austin, TX 78767
Travis County, Transportation and Natural Resources Department	Jon A. White P.O. Box 1748 Austin, TX 78767

Capital Metropolitan Transportation Authority (Capital Metro)	Todd Hemingson Attn: Planning Department 2910 East 5th Street Austin, TX 78702
Hays County	Bert Cobb, M.D. Hays County Courthouse 111 E. San Antonio Street Ste. 300 San Marcos, TX 78666
Elected Officials – National	
U.S. Senate	Senator Ted Cruz Austin District Office 300 East 8th St. #961 Austin, TX 78701
U.S. Senate	Senator John Cornyn Chase Tower 221 West Sixth Street, Suite 1530 Austin, TX 78701
U.S. House of Representatives	Congressman Lamar Smith Austin District Office 2211 South IH-35, Suite 106 Austin, TX 78741
U.S. House of Representatives	Congressman Lloyd Doggett Austin District Office 300 East 8th St. #763 Austin, TX 78701
U.S. House of Representatives	Congressman Michael T. McCaul Austin District Office 9009 Mountain Ridge Drive Suite 230 Austin, TX 78759
U.S. House of Representatives	Congressman Bill Flores Austin District Office 14205 Burnet Road, Suite 230 Austin, TX 78728
U.S. House of Representatives	Congressman Roger Williams Austin District Office 1005 Congress Ave., Suite 925 Austin, TX 78701
Elected Officials – State	
Governor	Governor Rick Perry P.O. Box 12428 Austin, Texas 78711-2428
Texas Senate	Senator Kirk Watson P.O. Box 12068, Capital Station

Texas Senate	Austin, TX 78711
Texas Senate	Senator Donna Campbell
	1902 E. Common St. Ste. 500
	New Braunfels, TX
Texas Senate	Senator Judith Zaffirini
	1407 Washington Street
	Laredo, TX 78042
Texas Senate	Senator Troy Fraser
	101 Highway 281 North, Suite 203
	Marble Falls, TX 78654
Texas House of Representatives	Representative Dawna Dukes
	P.O. Box 2910
	Room E1.504 Extension
	Austin, TX 78701
Texas House of Representatives	Representative Paul Workman
	P.O. Box 2910
	Room E1.216, Capitol Extension
	Austin, TX 78768
Texas House of Representatives	Representative Donna Howard
	P.O. Box 2910
	Austin, TX 78768
Texas House of Representatives	Representative Elliott Naishtat
	P.O. Box 29010
	Austin, TX 78768
Texas House of Representatives	Representative Eddie Rodriguez
	P.O. Box 2910
	Austin, TX 78768
Texas House of Representatives	Representative Jason Isaac
	P.O. Box 2910
	Room E1.414, Capitol Extension
	Austin, TX 78768
Texas House of Representatives	Representative Celia Israel
	P.O. Box 2910
	Austin, TX 78768
Elected Officials - Local	
	Judge Bert Cobb

Hays County	111 E. San Antonio St., Ste. 300
	San Marcos, Texas 78666
Hays County	Commissioner Mark Jones
	P.O. Box 1180
	Kyle, TX 78640
Hays County	Commissioner Ray Whisenant
	195 Roger Hanks Parkway
	Dripping Springs, TX 78620
Hays County	Commissioner Will Conley
	P.O. Box 2085
	Wimberley, TX 78676
Hays County	Commissioner Debbie Ingalsbe
	111 E. San Antonio St., Ste. 304
	San Marcos, Texas 78666
Travis County	Judge Samuel T. Biscoe
	P.O. Box 1748
	Austin, TX 78767
Travis County	Commissioner Margaret Gomez
	P.O. Box 1748
	Austin, TX 78767
Travis County	Commissioner Bruce Todd
	P.O. Box 1748
	Austin, TX 78767
Travis County	Commissioner Gerald Daugherty
	P.O. Box 1748
	Austin, TX 78767
Travis County	Commissioner Ron Davis
	P.O. Box 1748
	Austin, TX 78767
Elected Officials - CITY NAME	
Mayor of Austin	Mayor Lee Leffingwell
	P.O. Box 1088
	Austin, TX 78767
Austin City Council	Council Member Laura Morrison
	P.O. Box 1088
	Austin, TX 78767
Austin City Council	Council Member Chris Riley
	P.O. Box 1088
	Austin, TX 78767
Austin City Council	Council Member Kathie Tovo
	P.O. Box 1088
	Austin, TX 78767
Austin City Council	Council Member Sheryl Cole
	P.O. Box 1088

	Austin, TX 78767
Austin City Council	Council Member Mike Martinez
	P.O. Box 1088
	Austin, TX 78767
Austin City Council	Council Member Bill Spelman
	P.O. Box 1088
	Austin, TX 78767
Mayor of Buda	Mayor Todd Ruge
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member Angela Kennedy
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member Eileen Altmiller
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member George Haehn
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member Bobby Lane
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member Jose Montoya
	P.O. Box 1218
	Buda, TX 78610
Buda City Council	Council Member Wiley Hopkins
	P.O. Box 1218
	Buda, TX 78610
Mayor of Dripping Springs	Mayor Todd Purcell
	P.O. Box 384
	Dripping Springs, TX 78620
Dripping Springs City Council	Councilmember Wade King
	P.O. Box 384
	Dripping Springs, TX 78620
Dripping Springs City Council	Councilmember John Kroll
	P.O. Box 384
	Dripping Springs, TX 78620
Dripping Springs City Council	Mayor Pro Tem Bill Foulds
	P.O. Box 384
	Dripping Springs, TX 78620
Dripping Springs City Council	Councilmember Santos Alba
	P.O. Box 384
	Dripping Springs, TX 78620
	Councilmember Charles Busbey

Dripping Springs City Council	P.O. Box 384
	Dripping Springs, TX 78620
Mayor of Kyle	Mayor Lucy Johnson
	191 Cleveland
	Kyle, TX 78640
Kyle City Council	Council Member Tammy Swaton
	1533 Amberwood Loop
	Kyle, TX 78640
Kyle City Council	Council Member Becky Selbera
	301 W. Thiele
	Kyle, TX 78640
Kyle City Council	Council Member David Wilson
	P.O. Box 276
	Kyle, TX 78640
Kyle City Council	Mayor Pro Tem Samanta Bellows-LeMEnse
	P.O .Box 40
	Kyle, TX 78640
Kyle City Council	Council Member Chad Benninghoff
	P.O .Box 40
	Kyle, TX 78640
Mayor of San Marcos	Mayor Daniel Guerro
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember Lisa Prewitt
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember Jude Prather
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember John Thomaides
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember Wayne Becak
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember Ryan Thomason
	630 E. Hopkins
	San Marcos, TX 78666
San Marcos City Council	Councilmember Shane Scott
	630 E. Hopkins
	San Marcos, TX 78666
Mayor of Sunset Valley	Mayor Rose Cardona
	3205 Jones Road
	Sunset Valley, TX 78745

Sunset Valley City Council	Councilmember Forrest Arnold
	3205 Jones Road
	Sunset Valley, TX 78745
Sunset Valley City Council	Mayor Pro Tem Rudi Rosengarten
	3205 Jones Road
	Sunset Valley, TX 78745
Sunset Valley City Council	Councilmember Jeff Burdett
	3205 Jones Road
	Sunset Valley, TX 78745
Sunset Valley City Council	Councilmember Mickie Powers
	3205 Jones Road
	Sunset Valley, TX 78745
Sunset Valley City Council	Councilmember Walter Jenkins
	3205 Jones Road
	Sunset Valley, TX 78745
Mayor of Wimberley	Steve Thurber
	P.O. Box 2027
	Wimberley, TX 78676
Wimberley City Council	Councilmember Cindy Anderson
	P.O. Box 2027
	Wimberley, TX 78676
Wimberley City Council	Councilmember Pam Showalter
	P.O. Box 2027
	Wimberley, TX 78676
Wimberley City Council	Councilmember Tom Talcott
	P.O. Box 2027
	Wimberley, TX 78676
Wimberley City Council	Councilmember Matt Meeks
	P.O. Box 2027
	Wimberley, TX 78676
Wimberley City Council	Mayor Pro Tem John White
	P.O. Box 2027
	Wimberley, TX 78676
Interested Parties	
Barton Springs Edwards Aquifer Conservation District	John Dupnik, Vanessa Escobar, Dr. Brian Smith
	1124 Regal Row
	Austin, TX 78748
Save our Springs Alliance	Bill Bunch
	P.O. Box 684881
	Austin, TX 78768
Hill Country Conservancy	Attn: George Cofer
	P.O. Box 163125
	Austin, TX 78716-3125

Tonkawa Tribe of Indians of Oklahoma	Don Patterson, President
	1 Rush Buffalo Road
	Tonkawa, Oklahoma 74653

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APPENDIX L
PUBLIC MEETING SUMMARY REPORTS

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OPEN HOUSE SUMMARY

Comment and Response Report
for the SH 45SW Open House held Oct. 8, 2013

SH 45 SW
ENVIRONMENTAL STUDY

State Highway (SH) 45 Southwest
from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626
Travis and Hays Counties, Texas

Prepared for

Texas Department of Transportation

January 2015

Texas Department of Transportation

CENTRAL TEXAS
Regional Mobility Authority

SH 45 SW

ENVIRONMENTAL STUDY

OPEN HOUSE SUMMARY

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Attachment E Open House Display Boards

Attachment F Open House Handout Materials

Attachment G Open House Pictures

Attachment H Open House Sign-In Sheets

Attachment I Virtual Open House Information

Attachment J Written Comments Received

Attachment K Court Reporter Comment Transcript

Attachment L Community Survey Responses

OPEN HOUSE SUMMARY

An Open House Public Meeting was held by the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) on Oct. 8, 2013, to gather input regarding proposed State Highway 45 Southwest (SH 45SW). The purpose of the meeting was to gather public comment and input regarding the scope of the Environmental Impact Statement (EIS) to be prepared for the project, the draft Coordination Plan (**Attachment A**), and the project's Purpose and Need (**Attachment B**). The meeting was held from 5-8 p.m. in the Bailey Middle School cafeteria, 4020 Lost Oasis Hollow, Austin, Texas. The meeting utilized an open house, come-and-go format which allowed citizens to review project materials and speak to TxDOT, Mobility Authority and consultant staff on a one-on-one basis. A Virtual Open House ran concurrently with the 10-day comment period following the Open House Public Meeting (Oct. 9-18, 2013).

PROJECT DESCRIPTION

As currently proposed, SH 45SW would consist of mobility improvements between MoPac and FM 1626 in both northern Hays and southern Travis counties.

OPEN HOUSE INFORMATION

LEGAL NOTICES AND ADVERTISEMENTS

Legal notices for the Open House were published in the Austin American-Statesman on Sunday, Sept. 8, 2013, and Saturday, Sept. 28, 2013.

Color display advertisements were published in the Community Impact Newspaper on Sept. 19, 2013, (San Marcos/Buda/Kyle) and Sept. 26, 2013, (Southwest Austin), the Hays Free Press on Oct. 2, 2013, and the Oak Hill Gazette on Oct. 3, 2013.

Copies of the legal notices, display ads, tear sheets and affidavits are included in **Attachment C.**

E-NEWSLETTER

An e-newsletter announcing the Open House meeting and summarizing the project process, schedule, and draft Purpose and Need statement was distributed to 1,021 email addresses from the study's stakeholder database.

A copy of the e-newsletter is available in **Attachment D.**

ADDITIONAL NOTIFICATION/OUTREACH EFFORTS

Postcard advertisements were sent to individuals and businesses within the northern Hays/southern Travis county area via the Every Door Direct mailing system. A total of 21,963 postcards were distributed. See Table 1 for the number and dates of postcards delivered to each zip code. The postcards included:

- The date, time, location and purpose of the Open House meeting
- A map showing the study area as well as the Open House location (Bailey Middle School)
- The project website and information about the Virtual Open House
- Contact information for citizens to request translation or other communication assistance

Table 1: Postcard Distribution by Zip Code

Zip Code	Number of Postcards Distributed	Delivery Date
78610	4,278	9/24/13
78652	2,489	9/24/13
78737	1,084	9/24/13
78739	5,700	9/24-25/13
78748	8,412	9/24-25/13

A copy of the postcard is included in **Attachment D**.

TxDOT and the Mobility Authority released a media alert on Oct. 3, 2013, regarding the upcoming Open House. The alert mentioned the opportunity for media outlets to interview project officials and community residents. The media alert is included in **Attachment D.**

Letters and emails were sent to all elected officials within the project study area, advising them of the upcoming Open House. Emails were sent on Sept. 12, 2013, and letters were mailed on Sept. 17, 2013. Copies of the letter and email are included in **Attachment D.**

The SH 45SW website (www.sh45sw.com) was activated on Sept. 17, 2013, and included information on the date, time, location and purpose of the upcoming Open House.

OPEN HOUSE DATE, LOCATION, AND FORMAT

The Open House was held Tuesday, Oct. 8, 2013, in the Bailey Middle School cafeteria, 4020 Lost Oasis Hollow, Austin, Texas. The meeting was held from 5-8 p.m. It utilized an open house, come-and-go format where the public was able to review proposed project exhibits and discuss the environmental study process with project staff.

Eighteen informational boards were displayed around the room for public viewing. The boards included information on the proposed project's Purpose and Need statement, population growth and traffic volumes, land use and existing environment, the environmental process, project schedule, the Green Mobility Challenge, ways to get involved, next steps, and an invitation to an upcoming SH 45SW Environmental Workshop on Nov. 14, 2013.

Maps showing existing land uses and environmental considerations were displayed on tables for the public to view. Attendees were invited to mark or stick notes on the maps in order to draw attention to particular aspects, or to identify missing information.

Draft copies of the SH 45SW Purpose and Need statement (**Attachment B**) and Coordination Plan (**Attachment A**) were available in binders at designated tables for public review and comment.

Representatives from TxDOT, the Mobility Authority and the study team were positioned around the room to answer questions, facilitate discussion and gather input from attendees. In addition, three stations were set up for representatives from CAMPO, Capital Metropolitan Transportation Authority (Cap Metro) and the MoPac South Improvement Project.

Tables were arranged in the middle of the room so attendees could have a place to fill out comment forms and surveys. Two boxes were available on the tables and near the door for attendees to leave their completed comment cards and survey forms. A court reporter was also available to transcribe comments from attendees who desired to give their input verbally.

The informational boards are included in **Attachment E.**

REGISTRATION AND HANDOUTS

Upon arrival at the Open House, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and the Mobility Authority (including information on the Virtual Open House)
- SH 45SW fact sheet
- Comment form
- Community survey
- Email sign-up sheet (for attendees to receive project information)

The Open House handout materials are available in **Attachment F.**

Photographs of the Open House are available in **Attachment G.**

ATTENDANCE

A total of 261 people signed in from the general public at the Open House. In addition, five elected officials signed in.

Sign-in sheets for the Open House Meeting are included as **Attachment H.**

VIRTUAL OPEN HOUSE

The Virtual Open House on the project website (www.sh45sw.com) was available for public view Oct. 9-18, 2013. Each exhibit displayed at the Open House meeting was available for view as a PDF file, and links were provided for participants to submit official comments electronically and fill out the Community Survey through survey website SurveyMonkey. The Oct. 8 Open House attendees were notified of the Virtual Open House through the welcome letter handout.

The Virtual Open House recorded 888 unique page views during the 10 days it was available for view. In addition, 73 Community Surveys were filled out as a result of the Virtual Open House. Screenshots of the Virtual Open House and a Google Analytics report on page views is included as **Attachment I**.

PUBLIC COMMENT SUMMARY

A total of 488 comment submissions were received during the official comment period, including those received through the Virtual Open House. Some individuals submitted multiple comments. A summary of the comments received and a response to the comment follows in the Comment and Response Report. The Comment and Response Report is divided into two main sections: written comments (including written, electronic and mailed comments) and verbal comments. Written comments are further divided into two sections: similar comments (which include the same or similar language and intent) and unique comments. The following comment tables are organized as follows: Table 1, Same or Similar Written Comments; Table 2, Unique Written Comments; and Table 3, Verbal Comments.

Written comments are available in **Attachment J**.

The Court Reporter transcript is included in **Attachment K**.

Approximately 35 percent of the 488 comment submissions expressed support for the proposed project and 40 percent expressed opposition. The remaining 25 percent expressed neither support nor opposition to the project, but instead provided specific comments regarding some aspect of the project. It should also be noted that many of those expressing either support or opposition also provided specific comments.

Certain themes were prevalent among the comments, including support for SH 45SW to provide an alternative to congested roadways such as Brodie Lane, concern about the environmental

impacts of SH 45SW construction and operation, and concern about additional traffic on MoPac. Other themes included preference that the road operate as a non-toll facility, the need for more mass transit options, and the need to evaluate multiple mobility improvement alternatives in addition to SH 45SW.

A total of 181 individuals participated in the Community Survey, although not all participants answered every question. Participants were asked their opinions on the biggest issues (overall and mobility-related) facing northern Hays and southern Travis counties, and were asked how much they agreed or disagreed with a series of statements about mobility improvements. Common themes within the survey responses included heavy traffic on Brodie Lane and MoPac, rapid population growth, and the environmental sensitivity of the SH 45SW study area (particularly water quality). A majority of survey respondents strongly agreed that traffic congestion in the study area is a serious problem, and that a goal of any proposed improvement should be to manage congestion and better manage traffic. Survey responses to each question (exported as written out of SurveyMonkey) are included in **Attachment L.**

Attendees were invited to submit comments on the project and information received. They had the option of leaving their completed comment forms in drop boxes provided at the meeting, verbalizing their comments to a court reporter at the meeting or mailing/emailing their comments within a 10-day comment period. The deadline to receive written comments was Friday, Oct. 18, 2013.

Official comments were accepted between Sunday, Sept. 8, 2013, and Friday, Oct. 18, 2013, at midnight. Written comments were accepted if they were mailed (postmarked on or before Oct. 18, 2013) to the TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, faxed to 512-832-7157, or submitted on the project website (www.sh45sw.com) by the submission deadline.

OPEN HOUSE SUMMARY

Comment and Response Report
for the SH 45SW Open House held Dec. 10, 2013

SH 45 SW
ENVIRONMENTAL STUDY

State Highway (SH) 45 Southwest
from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626
Travis and Hays Counties, Texas

Prepared for

Texas Department of Transportation

January 2015

Texas Department of Transportation

CENTRAL TEXAS
Regional Mobility Authority

SH 45 SW

ENVIRONMENTAL STUDY

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Attachment G Open House Sign-In Sheets

Attachment H Virtual Open House Information

Attachment I Written Comments Received

Attachment J Court Reporter Comment Transcript

Attachment K Public-Suggested Other Alternatives

OPEN HOUSE SUMMARY

An Open House Public Meeting was held by the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) on Dec. 10, 2013, to gather input regarding State Highway 45 Southwest (SH 45SW). The purpose of the meeting was to gather public input on the alternatives being considered to fulfill the Purpose and Need **(Attachment A)**. The meeting was held from 5-8 p.m. in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting utilized an open house, come-and-go format which allowed citizens to review project materials and speak to TxDOT, Mobility Authority and consultant staff on a one-on-one basis. A Virtual Open House ran concurrently with the 10-day comment period following the Open House Public Meeting (Dec. 11-20, 2013).

STUDY SUMMARY

As currently proposed, SH 45SW would consist of mobility improvements between MoPac and FM 1626 in both northern Hays and southern Travis counties. The proposed facility would be a four-lane divided toll road on state-owned right-of-way with limited access and no frontage roads.

OPEN HOUSE INFORMATION

LEGAL NOTICES AND ADVERTISEMENTS

Legal notices for the Open House were published in the Austin American-Statesman on Sunday, Nov. 10, 2013, and Saturday, Nov. 30, 2013.

Color display advertisements were published in the Community Impact Newspaper on Nov. 21, 2013 (San Marcos/Buda/Kyle) and Nov. 27, 2013 (Southwest Austin), the Hays Free Press on Nov. 27, 2013 and the Oak Hill Gazette on Nov. 26, 2013.

Copies of the legal notices, display ads, tear sheets and affidavits are included in **Attachment B.**

E-NEWSLETTER

An e-newsletter announcing the Open House meeting and summarizing the previous Open House on October 8, as well as other project updates, was distributed to 1,284 email addresses from the study's stakeholder database.

A copy of the e-newsletter is available in **Attachment C.**

ADDITIONAL NOTIFICATION/OUTREACH EFFORTS

TxDOT and the Mobility Authority released a media alert on Dec. 5, 2013, regarding the upcoming Open House. The alert mentioned the opportunity for media outlets to interview project officials and community residents. The media alert is included in **Attachment C.**

Letters and emails were sent to elected officials within the project study area, advising them of the upcoming Open House. Emails were sent on Nov. 25, 2013, and letters were mailed on Nov. 26, 2013. Copies of the letter and email are included in **Attachment C.**

The SH 45SW website (www.sh45sw.com) provided information on the date, time, location and purpose of the upcoming Open House.

OPEN HOUSE DATE, LOCATION, AND FORMAT

The Open House was held Tuesday, Dec. 10, 2013, in the Bowie High School cafeteria, Slaughter Lane, Austin, Texas. The meeting was held from 5-8 p.m. It utilized an open house, come-and-go format where the public was able to review proposed project exhibits and discuss the environmental study process with project staff.

Twenty-five informational boards were displayed around the room for public viewing. The boards included information on the proposed project's Purpose and Need statement, population growth and traffic volumes, environmental and water quality challenges and solutions, common comment themes from the October 8 Open House, proposed alternatives to satisfy the project Purpose and Need, project schedule, ways to get involved and next steps.

Displayed after the 25 informational boards was a board inviting attendees to write down any additional alternatives they felt should be included in the environmental study process. Participants wrote down alternatives on small sheets of paper and stuck them to the board for further consideration by the project team. Suggestion summaries and responses are included below, under Public Comment Summary.

Representatives from TxDOT, the Mobility Authority and the study team were positioned around the room to answer questions, facilitate discussion and gather input from attendees. In addition, one table was set up for representatives from the MoPac South Improvement Project.

Tables were arranged in the middle of the room so attendees could have a place to fill out comment forms and surveys. Several boxes were available on the tables and near the door for attendees to leave their completed comment forms. A court reporter was also available to transcribe comments from attendees who desired to give their input verbally.

The informational boards are included in **Attachment D.**

REGISTRATION AND HANDOUTS

Upon arrival at the Open House, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and the Mobility Authority (including information on the Virtual Open House)
- SH 45SW fact sheet
- Comment form
- Email sign-up sheet (for attendees to receive project information)

The Open House handout materials are available in **Attachment E.**

Photographs of the Open House are available in **Attachment F.**

ATTENDANCE

A total of 146 people signed in from the general public at the Open House. Three elected officials signed in.

Sign-in sheets for the Open House Meeting are included as **Attachment G.**

VIRTUAL OPEN HOUSE

The Virtual Open House on the project website (www.sh45sw.com) was available for public view Dec. 11-20, 2013. Each exhibit displayed at the Open House meeting was available for view as a PDF file, and links were provided for participants to submit official comments. The Dec. 10 Open House attendees were notified of the Virtual Open House through the welcome letter handout.

The Virtual Open House recorded 500 unique page views during the 10 days it was available for view. Screenshots of the Virtual Open House and a Google Analytics report on page views is included as **Attachment H**.

PUBLIC COMMENT SUMMARY

A total of 153 comment submissions were received during the official comment period, including those received through the Virtual Open House. Some individuals submitted multiple comments.

A summary of the comments received and a response to the comment follows in the Comment and Response Report. The Comment and Response Report is divided into two main sections: written comments (including written, emailed, or mailed comments) and verbal comments. Written comments are further divided into two sections: similar comments (which include the same or similar language and intent) and unique comments. The following comment tables are organized as follows: Table 1, Same or Similar Written Comments; Table 2, Unique Written Comments; and Table 3, Verbal Comments.

Written comments are available in **Attachment I**.

The Court Reporter transcript is included in **Attachment J**.

Approximately 26 percent of the 153 comment submissions expressed support for the proposed project and 32 percent expressed opposition. The remaining 42 percent expressed neither support nor opposition to the project, but instead provided specific comments regarding some aspect of the project. It should also be noted that many of those expressing either support or opposition also provided specific comments.

Certain themes were prevalent among the comments, including support for SH 45SW to be built as soon as possible, concern about the environmental impacts of SH 45SW construction and operation (particularly water quality), and concern that SH 45SW would not substantially improve travel times. Several comments referenced the "Dynamic Traffic Study of State Highway 45 Southwest" recently prepared for CAMPO. Other themes included the need for more alternative transportation options (bus, rail, park and ride facilities), preference that the road operate as a non-toll facility, and the importance of improving existing roads/highways (particularly Brodie, Manchaca, I-35 and SH 130).

A total of 23 suggestions were placed on the "Other Alternatives" board which invited participants to list additional alternatives to fulfill the project's Purpose and Need. These suggested alternatives included building and operating Lone Star Rail; additional bus/light rail service and park and ride lots; expanding and improving existing roads and highways (Brodie, Manchaca, I-35); and constructing SH 45SW as a non-toll road. Summarized alternatives along with responses are shown in Table 4 of the Comment and Response Report. Original written suggestions are shown in **Attachment K.**

Attendees were invited to submit comments on the project information received. They had the option of leaving their completed comment forms in drop boxes provided at the meeting, verbalizing their comments to a court reporter at the meeting or mailing/emailing their comments within a 10-day comment period. The deadline to receive written comments was Friday, Dec. 20, 2013.

Official comments were accepted between Sunday, Nov. 10, 2013, and Friday, Dec. 20, 2013 at midnight. Written comments were accepted if they were mailed (postmarked on or before Dec. 20, 2013) to the TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, faxed to 512-832-7157, or submitted on the project website (www.sh45sw.com) by the submission deadline.

PUBLIC HEARING SUMMARY

Comment and Response Report
for the SH 45SW Public Hearing held July 29, 2014

SH 45 SW
ENVIRONMENTAL STUDY

State Highway (SH) 45 Southwest
from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626
Travis and Hays Counties, Texas

Prepared for

Texas Department of Transportation

December 2014

Texas Department of Transportation

CENTRAL TEXAS
Regional Mobility Authority

SH 45 SW
ENVIRONMENTAL STUDY

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PUBLIC HEARING SUMMARY

A Public Hearing was held by the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) on July 29, 2014, to gather input regarding State Highway 45 Southwest (SH 45SW). The purpose of the hearing was to give the community an opportunity to share thoughts on the preferred alternative and its potential environmental impacts, as detailed in the Draft Environmental Impact Statement (Draft EIS). The Draft EIS was available for review at the hearing and at www.sh45sw.com. The hearing was held in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting included an open house between 5-6 p.m., followed by technical presentations and a public comment period. A Virtual Open House ran concurrently with the comment period following the Public Hearing (July 29 – Aug. 13, 2014).

STUDY SUMMARY

As currently proposed, SH 45SW would consist of mobility improvements between MoPac and FM 1626 in northern Hays and southern Travis counties. The proposed facility would be a four-lane divided toll road on state-owned right-of-way with limited access and no frontage roads.

PUBLIC HEARING INFORMATION

LEGAL NOTICES AND ADVERTISEMENTS

A legal notice for the Public Hearing was published in the Austin American-Statesman on Sunday, June 29, 2014.

Color display advertisements were published in the Oak Hill Gazette on July 10, 2014, the Hays Free Press on July 16, 2014, the Austin American-Statesman on July 20, 2014, and the Community Impact Newspaper on July 17, 2014 (San Marcos/Buda/Kyle) and July 24, 2014 (Southwest Austin).

Copies of the legal notice, display ads, tear sheets and affidavits are included in **Attachment A.**

E-NEWSLETTER

E-newsletters announcing the Public Hearing were distributed on July 2, 2014 and July 22, 2014 to 1,504 email addresses within the study's stakeholder database. Another e-newsletter was sent on Aug. 7, 2014 which informed recipients that the Virtual Open House was currently open and official comments could be submitted until Aug. 13, 2014.

The City of Austin Transportation Department distributed an e-newsletter announcing the Public Hearing on July 28, 2014.

Copies of the e-newsletters are available in **Attachment B.**

ADDITIONAL NOTIFICATION/OUTREACH EFFORTS

Postcard advertisements were sent to individuals and businesses within the northern Hays/southern Travis county area via the Every Door Direct mailing system. A total of 21,531 postcards were distributed. See Table 1 for the number and dates of postcards delivered to each zip code. The postcards included:

- The date, time, location and purpose of the Public Hearing
- A map showing the study area as well as the Public Hearing location (Bowie High School)
- The project website address and information about the Virtual Open House
- Contact information for citizens to request translation or other communication assistance

Table 1: Postcard Distribution by Zip Code

Zip Code	Number of Postcards Distributed	Date Mailed
78610	4,252	7/14/14
78652	2,499	7/14/14
78737	1,104	7/14/14
78739	5,673	7/14/14
78748	8,003	7/14/14

Postcards were also mailed on July 14, 2014 to adjacent property owners as identified on the Travis County Appraisal District and Hays County Appraisal District websites, as well as stakeholder entries within the database which lacked corresponding email addresses. A total of 119 postcards were distributed to these recipients.

A copy of the postcard is included in **Attachment B**.

TxDOT issued a news release on July 3, 2014 announcing the SH 45SW environmental study was available for public review and that a public hearing would be held on July 29, 2014. TxDOT and the Mobility Authority released a media alert on July 28, 2014, regarding the upcoming Public Hearing. The alert summarized the project and mentioned the opportunity to review the environmental document and other project information. The news release and media alert are included in **Attachment B.**

Emails were sent to elected officials within the project study area on July 18, 2014, advising them of the upcoming Public Hearing. A copy of the email is included in **Attachment B.**

The SH 45SW website (www.sh45sw.com) provided information on the date, time, location and purpose of the upcoming Public Hearing. The SH 45SW project team and TxDOT also used Twitter to advertise the Public Hearing; screenshots of tweets are included in **Attachment B**.

PUBLIC HEARING DATE, LOCATION, AND FORMAT

The Public Hearing was held Tuesday, July 29, 2014, in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting included an open house between 5-6 p.m., followed by technical presentations and a public comment period. The open house followed a come-and-go format where the public was able to review proposed project exhibits and discuss the environmental study process with project staff. After the open house portion, Doug Booher and Lucas Short of TxDOT delivered presentations on the SH 45SW preferred alternative and Draft EIS.

During the comment period, members of the public were invited to comment on issues related to SH 45SW. Speakers were given a three-minute time limit to express their thoughts. A total of 41 people spoke at the hearing. A court reporter transcribed each comment.

Twelve informational boards were displayed around the room for public viewing. The boards included information on the proposed project's Purpose and Need statement, project location, alternatives considered, proposed water quality protection measures, conceptual renderings, project schedule and next steps.

Four large-format maps were displayed on a wall and on tables showing detailed schematics of the proposed SH 45SW facility. Each map focused on an individual section of the facility and included information on lanes, intersections, bridges, and shared-use paths.

Representatives from TxDOT, the Mobility Authority and the study team were positioned around the room to answer questions, facilitate discussion and gather input from attendees.

Tables were arranged towards the back of the room so attendees could have a place to fill out comment forms. Several boxes were available on the tables and near the door for attendees to leave completed comment forms. A court reporter was also available to transcribe comments from attendees who wanted to provide verbal input.

The informational boards, presentation, and schematics are included in **Attachment C.**

REGISTRATION AND HANDOUTS

Upon arrival at the Public Hearing, attendees were asked to sign in and were offered a set of handouts which included:

- Welcome letter from TxDOT and the Mobility Authority (including information on the Virtual Open House)
- Public Hearing agenda
- SH 45SW conceptual renderings
- Right-of-way information
- SH 45SW fact sheet
- Comment form

The Public Hearing handout materials are available in **Attachment D.**

Photographs of the Public Hearing are available in **Attachment E.**

ATTENDANCE

A total of 492 people signed in from the general public at the Public Hearing.

Sign-in sheets for the Public Hearing are included as **Attachment F.**

VIRTUAL OPEN HOUSE

The Virtual Open House on the project website (www.sh45sw.com) was available for public view July 29 – Aug. 13, 2014. Each exhibit displayed at the Public Hearing was available for view as a PDF file, and links were provided for participants to submit official comments. The Public Hearing attendees were notified of the Virtual Open House through the welcome letter handout.

The Virtual Open House recorded 515 unique page views during the 16 days it was available for view. Screenshots of the Virtual Open House and a Google Analytics report on page views is included as **Attachment G**.

PUBLIC COMMENT SUMMARY

A total of 1,210 comment submissions were received during the official comment period, including those received through the Virtual Open House. This report documents public comments and responses. Agency comments are covered in a separate report entitled Agency Comment and Response Report.

Some individuals submitted multiple comments. Comments received were either written (handwritten, mailed or emailed) or verbal (delivered to the Court Reporter during the Public Hearing).

Written comments are available in **Attachment H**.

The Court Reporter transcript is included in **Attachment I**.

A summary of the comments received and a response to each comment follows in the Public Comment and Response Report. The Comment and Response Report is divided into two tables. Table 1, Commenter Index, organizes each comment by commenter name, organization, and comment topic. Table 2, Comments and Responses, provides responses to each comment topic identified in Table 1. A graphic showing how to locate individual comments and responses is located on Page 7.

Certain themes were prevalent among the comments, including support for SH 45SW to be built as soon as possible, concern about the environmental impacts of SH 45SW construction and operation (particularly water quality), and concern regarding the scope and completeness of the Draft EIS document. Several people suggested that the Draft EIS be withdrawn until all of the individual sub-studies within the Draft EIS were finalized. Other commenters had specific questions or comments about the design of the facility itself and how it would interact with other roadways and projects in the region (such as the MoPac South Improvement Project, MoPac South Intersections, FM 1826 and FM 1626).

Attendees were invited to submit comments on the project information received. They had the option of leaving their completed comment forms in drop boxes provided at the hearing, verbalizing their comments to a court reporter at the hearing or mailing/emailing their comments within a 16-day comment period following the Public Hearing.

Official comments were accepted between Sunday, June 29, 2014, and Wednesday, Aug. 13, 2014 at midnight. Written comments were accepted if they were mailed (postmarked on or before Aug. 13, 2014) to the TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, faxed to 512-832-7157, or submitted on the project website (www.sh45sw.com) by the submission deadline.

PUBLIC COMMENT AND RESPONSE REPORT

How to Find Comments and Responses

Table 1: SH 45SW Commenter Index

Name of person making the comment

Last Name	First Name	Representing	Type Received	Comment Location *Appendix H – Written Appendix I - Verbal*	Comment Response Category *(see Table 2 for Reponses)*
Doe	John	ABC, Inc.	Written	H - 57	A1

Organization represented

Number label assigned to original comment

Category that corresponds to comment in Table 2 (see below)

Table 2: SH 45SW Comments and Responses

One of several categories used to group responses

Comment Category	Comment	Response
A	**Purpose and Need for Project**	
A1	Comment summary will appear here	The response from the Study Team will appear here

Category and sequential number assigned to each comment made

Summary of comment submitted

Study Team's response

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Abdullah	Joel	Self	Form - Keep MoPac Local	H - 962	A1, B1, C4, D5, G1, I1
Abrams	Adam	Self	Form - Keep MoPac Local	H - 816	A1, B1, C4, D5, G1, I1
Abrams	Adam	Save Our Springs Alliance (Dr. Ross)	Letter	H - 213 through H - 269	B1, B7, D1, D2, D5, D6, D7, D8, D9, D10, E1, E5, G5, G6, K4, L1
Abrams	Adam	Self	Letter	H - 270	A1, A2, A3, B1, D1, D2, D3, D4, D5, E1, E2, F1, F2, G1, H1, J1, J2, K1, K3, L1
Adams	J. Stephen	Self	Email - Keep MoPac Local	H - 354	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Adey	Elisha	Self	Form - Keep MoPac Local	H - 808	A1, B1, C4, D5, G1, I1
Adler	Jan	Self	Form - Keep MoPac Local	H - 781	A1, B1, C4, D5, G1, I1
Adler	Jan	Self	Form - Keep MoPac Local	H - 884	A1, B1, C4, D5, G1, I1
Adler	Jan	Self	Email - Keep MoPac Local	H - 355	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Agnew	Claudia	Self	Email - Keep MoPac Local	H - 356	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Aguirre	Jennifer	Self	Form - Keep MoPac Local	H - 948	A1, B1, C4, D5, G1, I1
Akers	Larry	Self	Webmail	H - 130	A1, A2, A3, A5, C4, D5, G1, G4
Albers	Alan	Self	Comment Form	H - 2	A1, C5, G1, L2
Albers	Alan	Self	Webmail	H - 158	C6, D1, D5, G1
Aleshire	Bill	Self	Verbal	I - 94	A1, A2, C5, D1, D5, G1, G2, G3
Alford	Jacklyn	Self	Email - Keep MoPac Local	H - 357	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Alitavoli	Sobhan	Self	Form - Keep MoPac Local	H - 973	A1, B1, C4, D5, G1, I1
Allen	Brooke	Self	Email - Keep MoPac Local	H - 358	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Allen	Jack	Self	Email - Keep MoPac Local	H - 359	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Allsup	Romalda	Self	Email - Keep MoPac Local	H - 360	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Amy	G.	Self	Email - Keep MoPac Local	H - 361	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
An	Il	Self	Comment Form	H - 3	A1, A2, H1, J4
Anderson	Susan	Self	Webmail	H - 135	A2, A6, L1
Anderson	Dr. T.H.	Self	Email - Keep MoPac Local	H - 364	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Anderson	Emma	Self	Email - Keep MoPac Local	H - 362	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Anderson	Leo	Self	Email - Keep MoPac Local	H - 363	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Anderson	M.M.	Self	Email - Keep MoPac Local	H - 366	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Anderson	Tommy	Self	Email - Keep MoPac Local	H - 365	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Andrews	Mandy	Self	Webmail	H - 165	A1, A5, C6, J2
Andris	Lynne	Self	Verbal	I - 84	A1, A6, C5
Andrus, RN, PhD	Lynne C.	Self	Comment Form	H - 4	A6
Arcediano	Paul	Self	Webmail	H - 122	C6
Arceneaux	Pamela	Self	Comment Form	H - 5	C6
Armitage	Angela	Self	Comment Form	H - 6	A1, A2, A4
Armstrong	Nancy	Self	Email - Keep MoPac Local	H - 367	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Arnold	Mary M.	Self	Email - Keep MoPac Local	H - 368	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ascot	Karin	Self	Email - Keep MoPac Local	H - 369	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Athans	Devon	Self	Email - Keep MoPac Local	H - 370	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Austen	Zelda	Self	Email - Keep MoPac Local	H - 371	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Avery	Richard	Self	Email - Keep MoPac Local	H - 372	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ayres	Jonathan	Self	Email - Keep MoPac Local	H - 373	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Backus	Andrew	Self	Email - Keep MoPac Local	H - 374	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Badgett	Becky	Self	Email - Keep MoPac Local	H - 375	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Baggett	Pam	Shady Hollow HOA, Keep Brodie Local	Verbal	I - 92	A1, A6, C6, G1, L1, L2
Bailey	Scott	Self	Webmail	H - 145	C6
Bailey	Brooke	Self	Email - Keep MoPac Local	H - 376	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Baker	Amber	Self	Form - Keep MoPac Local	H - 866	A1, B1, C4, D5, G1, I1
Baker	Kindal	Self	Webmail	H - 190	A1, A2, B1, B6, C1, C2, C4, D1, D3, D5, G1, G4, H1, H4, L1
Baker	Brandie	Self	Email - Keep MoPac Local	H - 378	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Baker	Roger	Self	Email - Keep MoPac Local	H - 377	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Barczak	Pascal	Self	Form - Keep MoPac Local	H - 799	A1, B1, C4, D5, G1, I1
Barker	Carson	Self	Form - Keep MoPac Local	H - 975	A1, B1, C4, D5, G1, I1
Barkley	John	Self	Form - Keep MoPac Local	H - 1069	A1, B1, C4, D5, G1, I1
Bateman	Merry	Self	Email - Keep MoPac Local	H - 379	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bates	Alvin	Self	Comment Form	H - 7	C5
Baxter	Rob	Self	Comment Form	H - 8	A1, C1
Baxter	Rob	Friendship Alliance of Hays County	Verbal	I - 80	A1, A5, A6, B1, C1, C4
Baxter	Rob	Self	Webmail	H - 119	A1, A2, A3, B2, C4, D1, G1
Baxter	Rob	Friendship Alliance of Hays County	Webmail	H - 170	A1, A2, B1, J2
Baxter	Rob	Self	Email - Keep MoPac Local	H - 380	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Bayarena	Dawn	Self	Webmail	H - 128	B1, B6, C4, G4, H1, I1
Beach	Lisa	Self	Webmail	H - 149	A1, C5, G1, J2
Beard	Robert	Self	Email - Keep MoPac Local	H - 381	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Beazer	Jonathan	Self	Webmail	H - 158	A1, A2, A4, A6, C4, H1, J2
Beceiro	Jose	Self	Webmail	H - 123	C6
Becerra	Kat	Self	Form - Keep MoPac Local	H - 877	A1, B1, C4, D5, G1, I1
Beck	Peter	St. Edwards University and Sierra Club	Verbal	I - 96	A3, B1, B6, C4, D1, D5, E1
Beck	Peter	Self	Email - Keep MoPac Local	H - 382	A2, A3, B1, B4, C4, D1
Becker	Al	Self	Email - Keep MoPac Local	H - 383	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bedrossian	Yvette	Self	Form - Keep MoPac Local	H - 893	A1, B1, C4, D5, G1, I1
Beers	Stephen	Self	Verbal	I - 98	B1, B2, B3, C4, D2, D3, D5, G1
Beers	Stephen	Save Barton Creek Association	Webmail	H - 184	B1, B2, C4, D1, D2, D3, D4, D5, G1, I2, I3, J4, K1, L1
Beesley	Ben	Self	Form - Keep MoPac Local	H - 856	A1, B1, C4, D5, G1, I1
Beesley	Haley	Self	Form - Keep MoPac Local	H - 857	A1, B1, C4, D5, G1, I1
Bell	T	Self	Webmail	H - 122	L1
Bell	Catherine	Self	Webmail	H - 139	A1, C1, C4
Bell	T.	Self	Email - Keep MoPac Local	H - 384	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Belle Williams	Alice	Self	Email - Keep MoPac Local	H - 385	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bell-Moore	Katie	Self	Comment Form	H - 54	C5, G1
Bellocchio	Brenda	Self	Form - Keep MoPac Local	H - 933	A1, B1, C4, D5, G1, I1
Bellonci	Gioconda	Self	Email - Keep MoPac Local	H - 386	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Belton	Rudy	Self	Webmail	H - 121	C6
Benevich	Chris	Self	Email - Keep MoPac Local	H - 387	A1, B1, C4, D5
Benjamin	Kolleen	Self	Webmail	H - 157	A1, C6, J2

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Bennis	Daniel	Self	Form - Keep MoPac Local	H - 910	A1, B1, C4, D5, G1, I1
Bennis	Katie	Self	Form - Keep MoPac Local	H - 946	A1, B1, C4, D5, G1, I1
Bentley	Melissa	Self	Webmail	H - 141	A1, A2, A5, C4
Bentley	Margaret	Self	Email - Keep MoPac Local	H - 388	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Berry	Lisa	Self	Form - Keep MoPac Local	H - 894	A1, B1, C4, D5, G1, I1
Bethune	Gina	Self	Webmail	H - 127	A6, C6
Beto	Mark	Self	Webmail	H - 142	A1, A2, A7, K2
Bettor	Laura	Self	Email - Keep MoPac Local	H - 389	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Beutelman	Henry	Self	Email - Keep MoPac Local	H - 390	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Billie	Jackie	Self	Form - Keep MoPac Local	H - 1022	A1, B1, C4, D5, G1, I1
Bishop	Sarah	Self	Email - Keep MoPac Local	H - 391	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Black	Cynthia	Self	Comment Form	H - 9	A1, A7, I1
Black	Tim	Self	Webmail	H - 159	C5
Blagdan	Bill	Self	Webmail	H - 146	B1, B6, C1, C2, D1, D5, G1, G4, H1, H4
Blagdan	Susie	Self	Email - Keep MoPac Local	H - 392	A1, B1, C1, C4, D5
Blandford	Whitney	Self	Form - Keep MoPac Local	H - 767	A1, B1, C4, D5, G1, I1
Blankenship	Lydia	Self	Webmail	H - 142	A1, A2, A4, A5, A6, C6
Blasé	Marc	Self	Email - Keep MoPac Local	H - 393	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Blau	Robert L.	Self	Email - Keep MoPac Local	H - 394	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Blazier	Chris	Self	Email - Keep MoPac Local	H - 395	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bobbitt	Wendy	Self	Email - Keep MoPac Local	H - 397	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Boblick	Mike	Self	Comment Form	H - 10	C5, I1, I3
Bodeen	Gabriel	Self	Form - Keep MoPac Local	H - 930	A1, B1, C4, D5, G1, I1
Bohanon	L.	Self	Form - Keep MoPac Local	H - 827	A1, B1, C4, D5, G1, I1
Bohanon	Yvonne	Self	Form - Keep MoPac Local	H - 836	A1, B1, C4, D5, G1, I1
Bolanos	Frances	Self	Form - Keep MoPac Local	H - 820	A1, B1, C4, D5, G1, I1
Bordovsky	Laddie	Self	Webmail	H - 125	A1, C6
Borst	Laura	Self	Email - Keep MoPac Local	H - 398	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bosada	David	Self	Webmail	H - 144	A1, A4, C4, G1, J4
Bosch	Alison	Self	Form - Keep MoPac Local	H - 1055	A1, B1, C4, D5, G1, I1
Boschert	Ralph	Self	Email - Keep MoPac Local	H - 399	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Bourbonnais	Sharon	Self	Form - Keep MoPac Local	H - 1018	A1, B1, C4, D5, G1, I1
Boyden	Mark	Self	Email - Keep MoPac Local	H - 400	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Brandt	Nicole	Self	Form - Keep MoPac Local	H - 1056	A1, B1, C4, D5, G1, I1
Braud	Aaron	Self	Webmail	H - 129	A6, C2, C4, G1, I3
Bray	Becky	Self	Verbal	I - 50	A1, A6, C5, G1
Breault	Benjamin	Self	Form - Keep MoPac Local	H - 918	A1, B1, C4, D5, G1, I1
Brede	Jesse	Self	Form - Keep MoPac Local	H - 792	A1, B1, C4, D5, G1, I1
Brennes	Erica	Self	Webmail	H - 135	A1, A7, K2, L2
Bresnen	Ken	Self	Webmail	H - 138	K2, L1
Brettle	Jessica	Self	Form - Keep MoPac Local	H - 854	A1, B1, C4, D5, G1, I1
Bright	Tammy	Self	Email - Keep MoPac Local	H - 401	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Briscoe Myers	Linda	Self	Webmail	H - 135	A1, A5, C4

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Briscoe Myers	Linda	Self	Email - Keep MoPac Local	H - 402	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Broderick	Becky	Self	Webmail	H - 150	A1, A2, A6, C5, J2
Brodnax	Pat	Self	Email - Keep MoPac Local	H - 403	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Brooks	Drew	Self	Form - Keep MoPac Local	H - 928	A1, B1, C4, D5, G1, I1
Brosowsky	Felix	Self	Form - Keep MoPac Local	H - 957	A1, B1, C4, D5, G1, I1
Brown	Roger	Self	Webmail	H - 127	A1, A2, C6, G4, J2
Brown	Kevin	Self	Webmail	H - 123	A2, C5
Brown	Roger	Self	Webmail	H - 117	C6
Browning	Luiza	Self	Form - Keep MoPac Local	H - 1064	A1, B1, C4, D5, G1, I1
Bruce	Sandra	Self	Form - Keep MoPac Local	H - 917	A1, B1, C4, D5, G1, I1
Brunson	Leigh Ann	Self	Email - Keep MoPac Local	H - 404	A1, B1, C4
Bryan	Kathy	Self	Email	H - 114	A1, B4, C4
Bryan	Kathy	Self	Webmail	H - 142	A1, A2, A5, L2
Bryan	Kathy	Self	Webmail	H - 143	C2, C4, D5, G1, H2
Buda	C.C.	Self	Webmail	H - 142	L1, L2
Buesing	Karl	Self	Email - Keep MoPac Local	H - 405	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Buffington	Kevin	Self	Webmail	H - 127	C6
Bulla	Dale	Self	Webmail	H - 130	A1, A5, C4, D5, G1, J1, J2
Bunch	Bill	Save or Springs Alliance, Keep Mopac Local	Verbal	I - 57	A1, A3, B1, B4, B6, C1, C4, D1, D5, G1
Bunch	Bill	Save Our Springs Alliance	Webmail	H – 171 through H - 176	A1, A2, A3, A5, A7, B1, B4, B6, C2, C3, C4, D1, D2, D3, D4, D5, E1, E2, F1, F2, G1, HI, H4, J1, K1, L1
Bunch	Bill	Save Our Springs Alliance	Webmail	H – 204 through H - 211	A1, A2, A3, A5, A7, B1, B4, B6, C2, C3, C4, D1, D2, D3, D4, D5, E1, E2, F1, F2, G1, HI, J1, K1, L1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Buonodono	Anthony	Self	Comment Form	H - 11	C6
Buonodono	Anthony	Self	Webmail	H - 119	C6
Burke	Carol	Self	Webmail	H - 161	A1, C6
Burke	Bill	Self	Webmail	H - 162	A1, A2, C6, I1
Burke	Bill	Self	Webmail	H - 162	A1, A2, C6, I1
Burns	Bruce	Self	Email - Keep MoPac Local	H - 406	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Burns	Bruce	Self	Email - Keep MoPac Local	H - 407	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Burns	Pierce	Self	Form - Keep MoPac Local	H - 1032	A1, B1, C4, D5, G1, I1
Burton	Bryce	Self	Comment Form	H - 12	A1, A2, A6
Burton	Toby	Self	Webmail	H - 164	A1, C6
Burton	Susan	Self	Webmail	H - 169	A1, A2, C5, J4
Burton	Scott	Self	Email - Keep MoPac Local	H - 408	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Busse	Beth	Self	Form - Keep MoPac Local	H - 1033	A1, B1, C4, D5, G1, I1
Butler	Eric	Self	Form - Keep MoPac Local	H - 823	A1, B1, C4, D5, G1, I1
Byars	Dana	Self	Webmail	H - 157	A1, A2, A6, C5, J2
Byers	Katherine	Self	Form - Keep MoPac Local	H - 784	A1, B1, C4, D5, G1, I1
Byers	Michele	Self	Form - Keep MoPac Local	H - 802	A1, B1, C4, D5, G1, I1
Byers	Sam	Self	Form - Keep MoPac Local	H - 963	A1, B1, C4, D5, G1, I1
Byrne	Elaine	Self	Email - Keep MoPac Local	H - 409	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Byrnes	Rick	Self	Webmail	H - 127	C4, D5, G1
Cabler	Cynthia	Self	Webmail	H - 160	A1, A2, A5, C6, H2
Calderon	Ernesto	Self	Email - Keep MoPac Local	H - 410	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Caldwell	Bob	Self	Comment Form	H - 13	C5, G1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Calhoun	Reid	Self	Form - Keep MoPac Local	H - 993	A1, B1, C4, D5, G1, I1
Calixtro	Jhon	Self	Form - Keep MoPac Local	H - 999	A1, B1, C4, D5, G1, I1
Camp	Dixie	Self	Email - Keep MoPac Local	H - 411	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Campbell	Don	Self	Form - Keep MoPac Local	H - 846	A1, B1, C4, D5, G1, I1
Campbell	Stacey	Self	Form - Keep MoPac Local	H - 869	A1, B1, C4, D5, G1, I1
Campbell	Sarah	Self	Email - Keep MoPac Local	H - 412	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Candelaria	Noel	Self	Webmail	H - 167	A1, A5, A6, C6
Cannon	Craig	Self	Comment Form	H - 14	L2
Cannon	Craig	Self	Webmail	H - 131	A1, K2, L1, L2
Cantrell	Keith	Self	Webmail	H - 176	A1, A3, A7, C6
Cardamone	DJ	Self	Comment Form	H - 15	A1, C5, G1
Carnes	Paul	Self	Webmail	H - 145	A1, C6, G1, G4
Carrera	Rodolfo	Self	Email - Keep MoPac Local	H - 413	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cartwright	Mary	Self	Email - Keep MoPac Local	H - 414	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Caspi	Jacques	Self	Form - Keep MoPac Local	H - 998	A1, B1, C4, D5, G1, I1
Casteel	Richard	Self	Form - Keep MoPac Local	H - 1030	A1, B1, C4, D5, G1, I1
Caswell	Brandy	Self	Form - Keep MoPac Local	H - 751	A1, B1, C4, D5, G1, I1
Caterine	Joe	Self	Form - Keep MoPac Local	H - 990	A1, B1, C4, D5, G1, I1
Catterson	Laura	Self	Form - Keep MoPac Local	H - 821	A1, B1, C4, D5, G1, I1
Causey	Zach	Self	Verbal	I - 101	A1, A6, C2, D2, D3, D5, G1
Chada	Farid	Self	Verbal	I - 74	A1, B6, C1, C3, D3, G1
Chada	NA	Self	Verbal	I - 109	A1, A2, B1, C3, D2, D5, I1
Chambers	Bill	Self	Comment Form	H - 17	C6

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Chapman	Diana	Self	Email - Keep MoPac Local	H - 415	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Charles	Greg	Self	Webmail	H - 188	A1, A2, J2
Chernow	Laureen	Self	Verbal	I - 44	A1, A6, C5, D1
Child	Jan	Self	Email - Keep MoPac Local	H - 416	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Chin	Helen	Self	Form - Keep MoPac Local	H - 965	A1, B1, C4, D5, G1, I1
Clapp	Melanie	Self	Webmail	H -149	A1, A2, C4, D5, G1, J2
Clapp	Melanie	Self	Email - Keep MoPac Local	H - 417	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Clark	Ann	Self	Email - Keep MoPac Local	H - 418	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Clark	Sara & Colin	Self	Form - Keep MoPac Local	H - 787	A1, B1, C4, D5, G1, I1
Clark	Fran	Self	Email - Keep MoPac Local	H - 419	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Clark	Jenny	Self	Email - Keep MoPac Local	H - 420	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Clary	Karen	Self	Webmail	H - 153	A1, A2, A4, B1, C2, C4, H1, H4, J4
Clary	James	Self	Webmail	H - 171	A1, A2, A4, B1, C2, C4, H1, H4, J4
Clue	Kelly	Self	Form - Keep MoPac Local	H - 1015	A1, B1, C4, D5, G1, I1
Coates	James	Self	Webmail	H - 146	A6, C6, G1
Coats	Tim	Self	Webmail	H - 162	A1, A5, A6, C6, J2
Cocke	Paula	Self	Email - Keep MoPac Local	H - 421	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Coffield	Rebecca	Self	Webmail	H - 166	A1, A2, A7, C6, J2
Coffin	Laurie	Self	Email - Keep MoPac Local	H - 422	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cole	Amber	Self	Webmail	H - 183	A1, A2, C5, I3
Collins	Marshall	Self	Form - Keep MoPac Local	H - 806	A1, B1, C4, D5, G1, I1
Commuter	Daily	Self	Webmail	H - 131	A1, A2

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Concerned Austin Driver		Self	Email - Keep MoPac Local	H - 423	A1, A2, C5, D5, H2
Coneway	Cathy	Self	Webmail	H - 121	C5
Conn	Steve	Self	Form - Keep MoPac Local	H - 882	A1, B1, C4, D5, G1, I1
Connell	Ann	Self	Email - Keep MoPac Local	H - 424	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Connelly	Jason	Self	Form - Keep MoPac Local	H - 813	A1, B1, C4, D5, G1, I1
Conner	Nicole	Self	Form - Keep MoPac Local	H - 1042	A1, B1, C4, D5, G1, I1
Conner	Mike	Self	Email - Keep MoPac Local	H - 425	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Conrad	Colleen	Self	Form - Keep MoPac Local	H - 875	A1, B1, C4, D5, G1, I1
Cook	Cindy	Self	Email - Keep MoPac Local	H - 426	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cook	Cindy	Self	Webmail	H - 127	C4, D5, G1
Cook	Gary M.	Self	Email - Keep MoPac Local	H - 427	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cook	Gary M.	Self	Email - Keep MoPac Local	H - 428	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Corbett	Heather	Self	Webmail	H - 141	C4
Corbin	Robert	Self	Verbal	I - 88	C4, D5
Corkill	Cindy	Self	Email - Keep MoPac Local	H - 429	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Corrigan	John & Angela	Self	Comment Form	H - 18	A2, C6
Corum	Claudia	Self	Webmail	H - 203	A1, A2, B1, B2, C1, C4, J1, L1
Corum	Claudia	Self	Email - Keep MoPac Local	H - 430	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cote	Rebecca	Self	Webmail	H - 132	C4, D5, G1
Cowhig	Cindy	Self	Webmail	H - 162	A1, A2, C5, L1
Cowser	Rebecca	Self	Email - Keep MoPac Local	H - 431	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cox	Andrew	Self	Form - Keep MoPac Local	H - 892	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Craig	Elizabeth G.	Self	Email - Keep MoPac Local	H - 432	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cranberry	Chaz	Self	Form - Keep MoPac Local	H - 994	A1, B1, C4, D5, G1, I1
Crane	John	Self	Webmail	H - 134	A1, A2, A3, C6, J4
Cravotta	Audrey	Self	Form - Keep MoPac Local	H - 814	A1, B1, C4, D5, G1, I1
Crawford	Pat	Self	Webmail	H - 162	A1, C6, J2
Crockett	Mike	Self	Webmail	H - 121	C6
Croft	Carol	Self	Webmail	H - 126	A1, A2, A7, L1
Croft	Carol	Self	Webmail	H - 126	A1, A2, A7, L1
Crossland	McKinzey	Self	Form - Keep MoPac Local	H - 871	A1, B1, C4, D5, G1, I1
Crozier	Beverly	Self	Email - Keep MoPac Local	H - 433	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Cruz	Sydney	Self	Form - Keep MoPac Local	H - 879	A1, B1, C4, D5, G1, I1
Culler	Sara	Self	Email - Keep MoPac Local	H - 434	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Culp	Janice	Self	Webmail	H - 149	A1, C5, D5, G4
Cummings	Jim	Self	Webmail	H - 147	C5
Cusson	Brian	Self	Email - Keep MoPac Local	H - 435	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
D	T	Self	Webmail	H - 176	A1, C5, G1, G4
Dale	Joe	Self	Webmail	H - 148	A1, A2, C6, I1
Dalton	Debra	Self	Email - Keep MoPac Local	H - 436	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
D'Amico	Ric	Self	Form - Keep MoPac Local	H - 805	A1, B1, C4, D5, G1, I1
Daniewicz	John	Self	Email - Keep MoPac Local	H - 437	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Davies	Leslie	Self	Form - Keep MoPac Local	H - 889	A1, B1, C4, D5, G1, I1
Davis	Kelly	Self	Email - Keep MoPac Local	H - 438	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Davison	Jerry	Self	Webmail	H - 122	C4, G1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Dawson	Ruth	Self	Email - Keep MoPac Local	H - 439	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Day	Cathleen	Self	Email - Keep MoPac Local	H - 440	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Day	Joanne	Self	Email - Keep MoPac Local	H - 442	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, J1, J2
Day	Joanne	Self	Email - Keep MoPac Local	H - 441	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Deal	Greg	Self	Webmail	H - 134	A1, A2, C5, G1
DeCesaris	Gayle	Self	Webmail	H - 131	A4, C6, L1
DeFord	Marion	Self	Email - Keep MoPac Local	H - 443	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
DeFord	Marion	Self	Email - Keep MoPac Local	H - 444	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
DeGrove	Owen	Self	Form - Keep MoPac Local	H - 942	A1, B1, C4, D5, G1, I1
DeHaven	Deanna	Self	Webmail	H - 141	A1, A2, A5, C4, G1, I3, J4
Delahoussaye	Joey	Self	Form - Keep MoPac Local	H - 754	A1, B1, C4, D5, G1, I1
Delahoussaye	Sallie	Self	Email - Keep MoPac Local	H - 445	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, J1, J2
Delano	Adam	Self	Form - Keep MoPac Local	H - 794	A1, B1, C4, D5, G1, I1
Deleon	Roger	Self	Email - Keep MoPac Local	H - 446	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Denshaw	Terez	Self	Form - Keep MoPac Local	H - 906	A1, B1, C4, D5, G1, I1
Denshaw	Jessica	Self	Form - Keep MoPac Local	H - 908	A1, B1, C4, D5, G1, I1
Derber	Scott	Self	Webmail	H - 122	I1, C6
Dever	Tom	Self	Webmail	H - 157	C5
Devine	Jeanne	Self	Webmail	H - 148	A1, A2, A3, A5, A7, B1, G1
Diederich	Bob	Self	Verbal	I - 48	A2, C1, C3
Dillard	Mason	Self	Comment Form	H - 19	D5, G1
Dison	Char	Self	Email - Keep MoPac Local	H - 447	A1, B1, C4, D5

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Doberenz	Allen	Self	Webmail	H - 158	A1, C6
Doebner	Thomas	Self	Webmail	H - 143	A1, C5, G4
Doerr	Michael	Self	Webmail	H - 159	D1, D2, D3, D4, D5, G1, G4, H1, K1
Dominguez	Cesar	Self	Webmail	H - 168	A1, A2, A5, C6
Donaldson	Richard	Self	Email - Keep MoPac Local	H - 448	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Dosky	Janis	Self	Email - Keep MoPac Local	H - 449	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Dov	Kathleen	Self	Form - Keep MoPac Local	H - 842	A1, B1, C4, D5, G1, I1
Dowd	Eamon	Self	Form - Keep MoPac Local	H - 952	A1, B1, C4, D5, G1, I1
Dowling	Christopher	Self	Email - Keep MoPac Local	H - 450	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Dowling	Tim	Self	Webmail	H - 145	C6
Doyle	K.	Self	Email - Keep MoPac Local	H - 451	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Dries	Laurie	Self	Webmail	H - 169	A5, B1, B6, C2, C4, D5, G1, H1, H2, I3
Duarte	Joseph	Self	Verbal	I - 76	A1, A5, A6, C6
Dudley	Brian	Self	Webmail	H - 189	A1, A7, B1, B2, B6, C1, C4, D5, G1, J1
Duemler	Steven	Self	Form - Keep MoPac Local	H - 955	A1, B1, C4, D5, G1, I1
Duff	Stac	Self	Webmail	H - 139	A2, A6, A7, C3, C5, D5, H2, L2
Duffey	Ryan	Self	Form - Keep MoPac Local	H - 947	A1, B1, C4, D5, G1, I1
Dugan	Sherri	Self	Webmail	H - 129	A1, C6, D5, G1, G4
Dugan	Robert	Self	Webmail	H - 165	A1, C6, G1, G4
Dukette	Scott	Self	Comment Form	H - 20	C6, G4, H2
Duncan	David	Self	Comment Form	H - 21	A1,A6, C6, G1
Dunn	Andrew	Self	Email - Keep MoPac Local	H - 452	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Dunn	Mary	Self	Email - Keep MoPac Local	H - 453	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Dworaczyk	Mary	Self	Webmail	H - 142	A1, A6, C5, G4, J2
Earnest	Walt	Self	Email - Keep MoPac Local	H - 454	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Eaton	Karla	Self	Webmail	H - 161	A1, C5
Echols	Anna Maria	Self	Webmail	H - 188	A1, A2, C5,
Eckel	Sean	Self	Email - Keep MoPac Local	H - 455	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Edge	Joanne	Self	Webmail	H - 160	A1, A2, C6
Eichelmann	Alice	Self	Webmail	H - 192	A1, A2, A6, C5, D1, D5, G4
Eichelmann	Michael	Self	Webmail	H - 201	A1, A2, A6, C5, D5, G1, G4
Eisenmenger	Michael	Self	Webmail	H - 145	A1, A6, A7, C6
Elder	Don	Self	Webmail	H - 152	A1, A2, A5, A6, C6, J2
Eliot	George	Self	Email - Keep MoPac Local	H - 456	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ellison	Mara	Self	Form - Keep MoPac Local	H - 911	A1, B1, C4, D5, G1, I1
Ely	Mary	Self	Email - Keep MoPac Local	H - 457	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Emmett	Angella	Self	Email - Keep MoPac Local	H - 458	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Escalante	Nico	Self	Form - Keep MoPac Local	H - 1023	A1, B1, C4, D5, G1, I1
Esparza	Danielle	Self	Webmail	H - 127	C4, D5
Espinoza	Mike	Self	Email - Keep MoPac Local	H - 459	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Evans	Sarah	Self	Form - Keep MoPac Local	H - 867	A1, B1, C4, D5, G1, I1
Evans	V Bruce	Self	Webmail	H - 118	A2, C2, C6
Evans	Julie	Self	Email - Keep MoPac Local	H - 460	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ewig	Susan	Self	Comment Form	H - 22	A1, A6, G1, I3
Fafard	Paul	Self	Email - Keep MoPac Local	H - 461	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Fairchild	Fancy	Self	Email - Keep MoPac Local	H - 462	A1, A2, A3, A7, B1, B4, C1, C4, D5, G1, H2, I1, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Farmer	Gary	Self	Webmail	H - 122	A2, A6, C5, H2
Faul	Erick	Self	Email - Keep MoPac Local	H - 463	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Faulkner	Marilyn	Self	Form - Keep MoPac Local	H - 872	A1, B1, C4, D5, G1, I1
Faust	Sarah	Self	Form - Keep MoPac Local	H - 839	A1, B1, C4, D5, G1, I1
Fielle	Michael	Self	Form - Keep MoPac Local	H - 863	A1, B1, C4, D5, G1, I1
Figlin	Valerie	Self	Form - Keep MoPac Local	H - 847	A1, B1, C4, D5, G1, I1
Fine	Kristin	Self	Email - Keep MoPac Local	H - 464	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Fitzgerald	Marianne	Self	Comment Form	H - 23	A1, A2, C6, G1
Fitzgerald	Yvette	Self	Form - Keep MoPac Local	H - 979	A1, B1, C4, D5, G1, I1
Fitzgerald	Lorraine	Self	Webmail	H - 159	A1, A5
Fitzgerald	Marianne	Self	Webmail	H - 161	A1, A2, A7, C6, G1, G4
Fitzgerald	Larry	Self	Webmail	H - 161	C6
Fitzgerrell	Shay	Self	Form - Keep MoPac Local	H - 840	A1, B1, C4, D5, G1, I1
Flan	David	Self	Form - Keep MoPac Local	H - 832	A1, B1, C4, D5, G1, I1
Flowers	Morgan	Self	Comment Form	H - 24	C4, D5, E1, G1
Flowers	Robin	Self	Form - Keep MoPac Local	H - 968	A1, B1, C4, D5, G1, I1
Ford	Michael O.	Self	Email - Keep MoPac Local	H - 465	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Foreman	David	Self	Comment Form	H - 25	A1, A2, A7, C5
Foreman	Betina	Self	Comment Form	H - 26	A1, A6, C5, D5
Foreman	Betina	Self	Verbal	I - 106	A1, A5, C6, D5, E1, G1, G4, J4
Foss	Linda N.	Self	Email - Keep MoPac Local	H - 467	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Foster	Alyssa	Self	Form - Keep MoPac Local	H - 1048	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Franklin	Steve	Self	Email - Keep MoPac Local	H - 468	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Freed	Brenda	Self	Email - Keep MoPac Local	H - 469	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, L1
French	Kevin	Self	Form - Keep MoPac Local	H - 783	A1, B1, C4, D5, G1, I1
Frick	John	Self	Email - Keep MoPac Local	H - 470	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Fry	Michael	Self	Webmail	H - 131	A3, C6
Fry	Bill	Self	Webmail	H - 169	A1, A2, A5, C6
Fuentes	Gaby	Self	Webmail	H - 169	C6, J2
Fulenwider	Jamie	Self	Webmail	H - 129	A1, A2, C5, J4
Fuller	Mariana	Self	Form - Keep MoPac Local	H - 980	A1, B1, C4, D5, G1, I1
Gaertner	Sarah	Self	Email - Keep MoPac Local	H - 471	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gaillour	Kathy	Self	Comment Form	H - 27	A7, B5, C6, G1, L1
Gallatin	Charles	Self	Comment Form	H - 28	A1, A6, C5, G4
Gallatin	Diane R.	Self	Comment Form	H - 29	A6, C5, D5, G1
Galvan	Adam	Self	Form - Keep MoPac Local	H - 935	A1, B1, C4, D5, G1, I1
Gammon	Bill	Self	Email - Keep MoPac Local	H - 472	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gandhi	Neil	Self	Form - Keep MoPac Local	H - 807	A1, B1, C4, D5, G1, I1
Garcia	Andrea	Self	Form - Keep MoPac Local	H - 817	A1, B1, C4, D5, G1, I1
Garcia	Gerald	Self	Verbal	I - 62	A1, A5, A6, C6
Garland	Colleen	Self	Verbal	I - 87	A1, B1, B6, C1, C2, C4, D5
Garza	Jon	Self	Form - Keep MoPac Local	H - 932	A1, B1, C4, D5, G1, I1
Garza	Bert	Self	Verbal	I - 90	A1, A6, C6, D5, G1
Garza	Rudy	Self	Webmail	H - 124	A1, A2, C6
Garza	Bert	Self	Webmail	H - 140	A2, C5, G1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Gatko-Taylor	Abby Anna	Self	Form - Keep MoPac Local	H - 1075	A1, B1, C4, D5, G1, I1
Gatling	NA	Self	Form - Keep MoPac Local	H - 772	A1, B1, C4, D5, G1, I1
Gazic	Carley	Self	Email - Keep MoPac Local	H - 473	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gebhard	Chris	Self	Email - Keep MoPac Local	H - 474	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gedalia	Judith	Self	Email - Keep MoPac Local	H - 475	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Geller	Leslie	Self	Email - Keep MoPac Local	H - 476	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
George	Andrew	Self	Email - Keep MoPac Local	H - 477	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
George	Barton	Self	Form - Keep MoPac Local	H - 991	A1, B1, C4, D5, G1, I1
George, Jr.	James K. & Diana S.	Self	Email - Keep MoPac Local	H - 478	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3, J1, J2
Georges	Jaclyn	Self	Form - Keep MoPac Local	H - 845	A1, B1, C4, D5, G1, I1
Gerhardt	Scott	Self	Form - Keep MoPac Local	H - 956	A1, B1, C4, D5, G1, I1
Gibson	Jillian	Self	Form - Keep MoPac Local	H - 941	A1, B1, C4, D5, G1, I1
Gier	Rita E.	Self	Email - Keep MoPac Local	H - 479	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gifford	Mary S.	Self	Email - Keep MoPac Local	H - 480	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gilbert	Alex	Self	Form - Keep MoPac Local	H - 969	A1, B1, C4, D5, G1, I1
Gilbert	Jim	Self	Webmail	H - 158	A1, C6
Gilbert	Steve	Self	Email - Keep MoPac Local	H - 481	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, J1, J2
Gillespie	J.H.	Save or Springs Alliance	Webmail	H - 193	B1, D1, D2, D3, D4, D5, D6, E5, L1
Gillespie	Hayley	Self	Email - Keep MoPac Local	H - 482	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Gillespie	Sharon	Self	Email - Keep MoPac Local	H - 483	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gillespie, PhD	J.H.	Self	Letter	H - 302 through H - 318	B1, D1, D2, D3, D4, D5, D6, E5, L1
Gilley	Jane	Self	Email - Keep MoPac Local	H - 484	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gilliland	Robert	Self	Webmail	H - 124	A1, B1, C2, C4, D5, G1, G4, H1
Ginn	Richard	Self	Webmail	H - 119	A1, A2, L1
Givarz	Erin	Self	Form - Keep MoPac Local	H - 964	A1, B1, C4, D5, G1, I1
Glawe	Ethan R.	Self	Email - Keep MoPac Local	H - 485	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Glenn	Lisa	Self	Webmail	H - 141	A1, A5, J1, J2
Godfrey	Grant	Self	Email - Keep MoPac Local	H - 487	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Godwin	Will	Self	Email - Keep MoPac Local	H - 493	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Goff	Gayle	Self	Email - Keep MoPac Local	H - 488	A1, B1, B6, C4, D5
Goldsmith	Joan	Self	Email - Keep MoPac Local	H - 489	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Goltz	Jason	Self	Webmail	H - 147	A1, A2, A3, A4, C6, G1
Gonzales	Albert	Self	Email - Keep MoPac Local	H - 491	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gonzales	Melanie	Self	Form - Keep MoPac Local	H - 886	A1, B1, C4, D5, G1, I1
Gonzales, Jr.	Rudy	Self	Email - Keep MoPac Local	H - 490	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gonzalez	Raul	Self	Email - Keep MoPac Local	H - 492	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Good	Steven	Self	Webmail	H - 165	A1, A2, A5, C6
Goodrich	Raymon	Self	Form - Keep MoPac Local	H - 1026	A1, B1, C4, D5, G1, I1
Goodson	Barbara	Self	Comment Form	H - 30	A1, C5
Gordon-Brodnax	Pat	Self	Form - Keep MoPac Local	H - 931	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Gott	Deidre	Self	Form - Keep MoPac Local	H - 858	A1, B1, C4, D5, G1, I1
Gough	Kori	Self	Email - Keep MoPac Local	H - 494	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gouraige	Heather & Rodney	Self	Comment Form	H - 31	C4, G1, H1, H2, I1, I2
Graham	Robert G.	Self	Comment Form	H - 32	A1, C6, G1, G4
Graham, P.E.	Shawn	Self	Comment Form	H - 33	A1, B5, C6, D5, G1
Grasshoff	Ray	Self	Webmail	H - 158	C6
Gray	Kevin R.	Self	Email - Keep MoPac Local	H - 495	A1, A2, A7, B1, C1, C4, D5, G1, I1, I3
Greene	Ed & Ellie	Self	Email - Keep MoPac Local	H - 496	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Grimmett	Joel	Self	Email - Keep MoPac Local	H - 497	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gullion	Dion	Self	Form - Keep MoPac Local	H - 888	A1, B1, C4, D5, G1, I1
Gutierrez	Colleen	Self	Email - Keep MoPac Local	H - 498	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Gutierrez	Rebecca	Self	Form - Keep MoPac Local	H - 961	A1, B1, C4, D5, G1, I1
Guzman	Gloria A.	Self	Email - Keep MoPac Local	H - 499	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Haesly	Jack	Self	Email - Keep MoPac Local	H - 500	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hagelberg	Rob	Self	Webmail	H - 121	D6
Hagle	Steve	Texas Commission on Environmental Quality	Letter	H - 319	C6, D2, D3, D5, G1, K1
Halbreich	Andrew	Self	Email - Keep MoPac Local	H - 501	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Halbreich	Eli	Self	Comment Form	H - 34	C4, D5, G1, H4
Halbreich	Linda	Self	Email - Keep MoPac Local	H - 502	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hall	Chris	Self	Verbal	I - 108	A1, L2
Hall	Julie	Self	Email - Keep MoPac Local	H - 503	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Hall	Mark S.	Self	Email - Keep MoPac Local	H - 505	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, J4
Hall	Miriam	Self	Email - Keep MoPac Local	H - 504	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Halle	H.	Self	Form - Keep MoPac Local	H - 766	A1, B1, C4, D5, G1, I1
Halpin	Beki	Self	Webmail	H - 133	A1, A2, B1, B4, B6, C1, C2, D1, D2, D5, E1, E2, G1, G4, H1, J1
Halpin	Margaret	Self	Email - Keep MoPac Local	H - 506	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hamborsky	Stephanie	Self	Form - Keep MoPac Local	H - 1010	A1, B1, C4, D5, G1, I1
Hancock	Sheila	Self	Comment Form	H - 35	C5
Hancock	Tommy Joaquin	Self	Email - Keep MoPac Local	H - 507	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hanrahan	Lawrence	Gragg Tract, LP	Letter	H - 320	A2, A6, C3, J4, L1
Hansen	Yvonne	Self	Email - Keep MoPac Local	H - 508	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hardy	Janet	Self	Form - Keep MoPac Local	H - 859	A1, B1, C4, D5, G1, I1
Hardy	Jackie	Self	Form - Keep MoPac Local	H - 958	A1, B1, C4, D5, G1, I1
Hariharan	Sridhar	Self	Comment Form	H - 37	A1, C5, H2
Hariharan	Gayathri	Self	Webmail	H - 138	A1, A2, C5, G1, G4, H2, I1, I3, J2, J4
Hariharan	Eesha	Self	Webmail	H - 139	A1, C6
Harkey	Elizabeth	Self	Email - Keep MoPac Local	H - 509	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Harkey	Elizabeth	Self	Webmail	H - 141	A1, C4
Harkins	Victoria	Self	Webmail	H - 158	A1, A2, A5, A6
Harkrider	Chris	Self	Webmail	H - 128	A1, A2, C6, D5, G1, G4
Harrigan	Jan	Self	Email - Keep MoPac Local	H - 510	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Harris	Olivia	Self	Comment Form	H - 38	C2, D5
Harris	Stephanie	Self	Form - Keep MoPac Local	H - 887	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Harrison	John	Self	Webmail	H - 121	A1, A5, C6, G4, H2
Harston	Walt	Self	Form - Keep MoPac Local	H - 1065	A1, B1, C4, D5, G1, I1
Harston	Tiffany	Self	Form - Keep MoPac Local	H - 1066	A1, B1, C4, D5, G1, I1
Hart	Stephanie	Self	Form - Keep MoPac Local	H - 1024	A1, B1, C4, D5, G1, I1
Hartigan	John	Self	Comment Form	H - 36	C4
Hastings	Jeff	Self	Form - Keep MoPac Local	H - 760	A1, B1, C4, D5, G1, I1
Hawkins	Connie	Self	Webmail	H - 159	A1, A5, A6, C5, H2, J4
Hayes	Raymond	Self	Webmail	H - 121	C5
Heikkala	Thomas	Self	Webmail	H - 117	C4, D5, G1
Heldenfels, IV	Fred	Self	Webmail	H - 121	C6
Hempel	Charles	Self	Webmail	H - 159	A1, A2, C6
Henderson	Don	Self	Form - Keep MoPac Local	H - 951	A1, B1, C4, D5, G1, I1
Hennard	Justin	Self	Email - Keep MoPac Local	H - 511	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hergotz	William	Self	Comment Form	H - 39	A1, A2, C5
Herman	Jay	Self	Email - Keep MoPac Local	H - 512	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Herron	Nancy	Self	Webmail	H - 148	A1, C6, I1, J2
Hershberg	Lynn	Self	Form - Keep MoPac Local	H - 769	A1, B1, C4, D5, G1, I1
Hester	Jan	Self	Email - Keep MoPac Local	H - 513	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hibpshman	Karen	Self	Webmail	H - 146	A6, C1, C3, C4, J2
Hilbig	Robert	Self	Webmail	H - 145	A1, A2, A5, C6, D5, G1, G4, J4
Hill	Cindy	Self	Email - Keep MoPac Local	H - 514	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hill	John	Self	Form - Keep MoPac Local	H - 812	A1, B1, C4, D5, G1, I1
Hill	Ronald	Self	Webmail	H - 203	A1, A7, C3, C5, L1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Hill	Roberta	Self	Email - Keep MoPac Local	H - 515	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hill	Sharon	Self	Email - Keep MoPac Local	H - 516	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hite	Ed	Self	Webmail	H - 157	A1, A2, A5, A6, C5, G1
Hodge	Teresa	Self	Email - Keep MoPac Local	H - 517	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hodge	Teresa	Self	Email - Keep MoPac Local	H - 518	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hodges	Daniel	Self	Webmail	H - 120	C6
Hoffman	Kevin	Self	Comment Form	H - 40	A1, A2, C6
Hoffman	Tina	Self	Webmail	H - 161	A1, A2, C6, J4
Hofstetter	Josh	Self	Webmail	H - 167	A1, C6
Holcomb	Joi	Self	Email - Keep MoPac Local	H - 519	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Holder	Linda	Self	Email - Keep MoPac Local	H - 520	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Holder	Margaret	Self	Email - Keep MoPac Local	H - 521	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Holliday	Daina	Self	Email - Keep MoPac Local	H - 522	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Holliday	Daina	Self	Webmail	H - 123	A1, B1, C1, C4, D5, G1, G4, H1, H4
Holoubek	Jason	Self	Email - Keep MoPac Local	H - 523	A1, A3, B1, C4, D5
Hooks	Matt	Self	Webmail	H - 119	C6, G4
Hooks	Michael	Self	Webmail	H - 133	A1, A2, A6
Hooks	Michael	Self	Webmail	H - 135	A1, A2, A6
Hopkins	Kiernan	Self	Form - Keep MoPac Local	H - 985	A1, B1, C4, D5, G1, I1
Hopson	Christina	Self	Form - Keep MoPac Local	H - 907	A1, B1, C4, D5, G1, I1
Hoseiny	Dorna	Self	Form - Keep MoPac Local	H - 936	A1, B1, C4, D5, G1, I1
Houston	Cynthia L.	Self	Email - Keep MoPac Local	H - 524	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Hovenweep	Chelsea	Self	Email - Keep MoPac Local	H - 525	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Howerton	Joanna	Self	Email - Keep MoPac Local	H - 526	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Howes	Richard Ian	Self	Email - Keep MoPac Local	H - 527	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Howington	Chris	Self	Webmail	H - 182	A1, A2, A5, A6, C6, D5, E2, G4
Hoyt	Brian	Self	Webmail	H - 147	B1, D1, D2, D3, D4, D5, G1, L1
Hubele	Joachim	Self	Form - Keep MoPac Local	H - 764	A1, B1, C4, D5, G1, I1
Hubele	Lauren	Self	Form - Keep MoPac Local	H - 765	A1, B1, C4, D5, G1, I1
Huckaby	Clay	Commissioners of Hays County Emergency Service, District 2 and 8	Verbal	I - 41	A5, A6, C6
Hughes	Bruce	Self	Email - Keep MoPac Local	H - 528	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Hughes	Jonathan	Self	Form - Keep MoPac Local	H - 1020	A1, B1, C4, D5, G1, I1
Hull	Becky	Self	Webmail	H - 160	A1, A2, A7, C6, J2
Hume	Scott	Self	Form - Keep MoPac Local	H - 786	A1, B1, C4, D5, G1, I1
Humphrey	Doris	Self	Webmail	H - 202	A1, A5, A6, C5, D5, G1, G4
Hundley	Marie	Self	Form - Keep MoPac Local	H - 926	A1, B1, C4, D5, G1, I1
Hurley	Mary	Self	Webmail	H - 150	A1, A2, C5, J2,
Hurst	Gin	Self	Webmail	H - 150	C2, C4, D5, J1
Hutchins	Lincoln	Self	Form - Keep MoPac Local	H - 1037	A1, B1, C4, D5, G1, I1
Inbody	Donald	Self	Comment Form	H - 41	A1, C6, H2, J4
Inbody	Claire J.	Self	Comment Form	H - 42	A1, C5, H2, J4
Ingarfield	Colin	Self	Email - Keep MoPac Local	H - 529	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ingram	Glee	Self	Email - Keep MoPac Local	H - 530	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Inman	Dan	Self	Form - Keep MoPac Local	H - 775	A1, B1, C4, D5, G1, I1
Inman	Gretchen	Self	Form - Keep MoPac Local	H - 776	A1, B1, C4, D5, G1, I1
Ippolito	Gregory	Self	Email - Keep MoPac Local	H - 531	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Isaac	Jason A.	Self	Letter	H - 349	A6, C5, D3, D5, G1
Isung	Bonnie	Self	Form - Keep MoPac Local	H - 1074	A1, B1, C4, D5, G1, I1
Ivener	Andy	Self	Webmail	H - 164	A6
Ivey	Virginia	Self	Email - Keep MoPac Local	H - 532	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Jack	Jeff	Self	Webmail	H - 130	A1, B1, B4, G1
Jackman	Lakshmi	Self	Form - Keep MoPac Local	H - 924	A1, B1, C4, D5, G1, I1
Jackson	Mark	Self	Email - Keep MoPac Local	H - 533	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Jacques	Sally	Self	Webmail	H - 164	A1, A2, A3, B1, B6, C4
Janes	Brandon	Self	Webmail	H - 119	C5
Janes	Brandon	Self	Webmail	H - 120	C5
Janssen	Michelle	Self	Form - Keep MoPac Local	H - 977	A1, B1, C4, D5, G1, I1
Jaramillo	Jose	Self	Comment Form	H - 44	A1, C6, G1
Jasinski	Daniel	Self	Webmail	H - 127	A3, B1, B6, I1, I2, I3
Jeanes	Brian	Self	Form - Keep MoPac Local	H - 921	A1, B1, C4, D5, G1, I1
Jeffers	Matt	Self	Form - Keep MoPac Local	H - 870	A1, B1, C4, D5, G1, I1
Jelvaryce	Manera	Self	Form - Keep MoPac Local	H - 949	A1, B1, C4, D5, G1, I1
Jenkins	Rose	Self	Form - Keep MoPac Local	H - 1017	A1, B1, C4, D5, G1, I1
Jenkins	Julie	Self	Email - Keep MoPac Local	H - 534	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Jensen	David	Self	Webmail	H - 143	A1, A2, A7, B1, C1, D2, L1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Jessee	Taze	Self	Form - Keep MoPac Local	H - 798	A1, B1, C4, D5, G1, I1
Johns	Rich	Self	Form - Keep MoPac Local	H - 967	A1, B1, C4, D5, G1, I1
Johnson	Carol	Self	Email - Keep MoPac Local	H - 535	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Johnson	Athulya	Self	Form - Keep MoPac Local	H - 835	A1, B1, C4, D5, G1, I1
Johnson	Lauren	Self	Email - Keep MoPac Local	H - 536	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Johnson	Nathan	Self	Email - Keep MoPac Local	H - 537	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Johnston	Seth	Self	Webmail	H - 121	C6
Jones	Commissioner Mark	Hays County, Precinct 2	Verbal	I - 35	C5, G1, I1
Jones	David	Self	Webmail	H - 119	A1, A2, A7, C6
Jones	Timothy	Self	Webmail	H - 130	C6
Jones	Charles	Self	Webmail	H - 132	D5, F1
Jones	Michael	Self	Email - Keep MoPac Local	H - 538	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Joyner	John	Self	Email - Keep MoPac Local	H - 539	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Judd	Laura	Self	Webmail	H - 158	A1, C6, J2
Justus	Carolee	Self	Email - Keep MoPac Local	H - 540	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kahn	Steve	Self	Email - Keep MoPac Local	H - 541	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kaiser	Erin	Self	Email - Keep MoPac Local	H - 542	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kallerman	Dick	Self	Webmail	H - 151	A1, A2, A3, A7, B1
Kaough	Charles W.	Self	Form - Keep MoPac Local	H - 989	A1, B1, C4, D5, G1, I1
Katz	Josh	Self	Webmail	H - 142	A5, C4, D5, G1, G4, H1, I3, J1, J2
Kaufmann	Greg	Self	Comment Form	H - 45	C6, G1
Kavanagh	Kate	Self	Email - Keep MoPac Local	H - 543	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Kavanagh	Kristin	Self	Email - Keep MoPac Local	H - 544	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kay	Ariel	Self	Form - Keep MoPac Local	H - 881	A1, B1, C4, D5, G1, I1
Keegan	Katherine	Self	Form - Keep MoPac Local	H - 809	A1, B1, C4, D5, G1, I1
Kelly	Trace	Self	Form - Keep MoPac Local	H - 822	A1, B1, C4, D5, G1, I1
Kelly	Daniel	Self	Form - Keep MoPac Local	H - 934	A1, B1, C4, D5, G1, I1
Kelly-Dillon	Mary	Self	Verbal	I - 64	A1, A2, A5, A6, C6, H2
Kennedy	Kevin	Self	Comment Form	H - 46	A6, C6, G1
Kepner	David	Self	Email - Keep MoPac Local	H - 545	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kerber	Lisa	Self	Form - Keep MoPac Local	H - 914	A1, B1, C4, D5, G1, I1
Keys	Kay	Self	Email - Keep MoPac Local	H - 546	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Khalsa	Shakti	Self	Email - Keep MoPac Local	H - 547	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kidd	Bo	Self	Webmail	H - 131	C5
Kile	Thomas	Self	Email - Keep MoPac Local	H - 548	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
King	David	Self	Email - Keep MoPac Local	H - 549	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
King	Wendy	Self	Form - Keep MoPac Local	H - 1057	A1, B1, C4, D5, G1, I1
Kipner	Tim	Self	Form - Keep MoPac Local	H - 838	A1, B1, C4, D5, G1, I1
Kirk	Holly	Self	Form - Keep MoPac Local	H - 899	A1, B1, C4, D5, G1, I1
Kirk	Bill	Self	Form - Keep MoPac Local	H - 916	A1, B1, C4, D5, G1, I1
Kleinman	Matthew	Self	Form - Keep MoPac Local	H - 782	A1, B1, C4, D5, G1, I1
Kloc	Diane	Self	Email - Keep MoPac Local	H - 550	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Klose	Joanna	Self	Email - Keep MoPac Local	H - 551	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Knedlik	Keith	Self	Form - Keep MoPac Local	H - 753	A1, B1, C4, D5, G1, I1
Kneeland	Linda	Self	Webmail	H - 130	A1, A2, A5, C5
Kneeland	Robert	Self	Webmail	H - 130	C5, G1
Knight	Stacey	Self	Webmail	H - 128	A6, C6, G4
Knippa	Bill	Self	Webmail	H - 121	H1, L1
Kniss	Elke	Self	Form - Keep MoPac Local	H - 902	A1, B1, C4, D5, G1, I1
Knedlik	Lauri	Self	Form - Keep MoPac Local	H - 1011	A1, B1, C4, D5, G1, I1
Koeniger	Patty	Self	Form - Keep MoPac Local	H - 768	A1, B1, C4, D5, G1, I1
Kohler	Allan	Self	Form - Keep MoPac Local	H - 909	A1, B1, C4, D5, G1, I1
Konvicka	Julie	Self	Email - Keep MoPac Local	H - 552	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kormondy	Kristy	Self	Form - Keep MoPac Local	H - 801	A1, B1, C4, D5, G1, I1
Kostroski	Nita	Self	Email - Keep MoPac Local	H - 553	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kovach	John	Self	Form - Keep MoPac Local	H - 878	A1, B1, C4, D5, G1, I1
Kovach	Kristine	Self	Form - Keep MoPac Local	H - 883	A1, B1, C4, D5, G1, I1
Kragas	Berit	Self	Form - Keep MoPac Local	H - 987	A1, B1, C4, D5, G1, I1
Kreps	Karen	Self	Email - Keep MoPac Local	H - 554	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Krieger	Scot	Self	Webmail	H - 119	C5
Kruciak	Don	Self	Webmail	H - 143	B5, C5
Kurtz	Christian	Self	Email - Keep MoPac Local	H - 555	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Kwiatkowski	Stephanie	Self	Form - Keep MoPac Local	H - 945	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
L	Elias	Self	Webmail	H - 157	A1, C5
Labriola	Joe	Self	Comment Form	H - 47	A6, C3, G1
Lacey	Gina	Self	Email - Keep MoPac Local	H - 556	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
LaChance	Burnett	Self	Webmail	H - 136	A1, A2, A7
Lafaitte	Gary	Self	Form - Keep MoPac Local	H - 1034	A1, B1, C4, D5, G1, I1
Lafaitte	Gary	Self	Form - Keep MoPac Local	H - 1038	A1, B1, C4, D5, G1, I1
Laird	Lisa	Self	Webmail	H - 132	A1, A2, A6, B1, C4, H1
Landrum	Phil	Self	Webmail	H - 136	C5
Lange	Damon	Self	Email - Keep MoPac Local	H - 557	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Langford	Brad	Self	Email - Keep MoPac Local	H - 558	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Langston	Anna	Self	Email - Keep MoPac Local	H - 559	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Latus	Jeff	Self	Webmail	H - 141	C6
Lavin	Rachel	Self	Form - Keep MoPac Local	H - 905	A1, B1, C4, D5, G1, I1
Law	Dean	Self	Email - Keep MoPac Local	H - 560	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Lawrence	Eric	Self	Email - Keep MoPac Local	H - 561	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Lazor	Adam	Self	Form - Keep MoPac Local	H - 1005	A1, B1, C4, D5, G1, I1
Lee	Gracille	Self	Form - Keep MoPac Local	H - 850	A1, B1, C4, D5, G1, I1
Lee	James	Self	Form - Keep MoPac Local	H - 851	A1, B1, C4, D5, G1, I1
Leeper	Nancy	Self	Comment Form	H - 48	D5, E2, F2, G1, H4
Lehman	Chris	Self	Email - Keep MoPac Local	H - 562	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Leight	Elizabeth	Self	Email - Keep MoPac Local	H - 563	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Leon	Maria	Self	Form - Keep MoPac Local	H - 1002	A1, B1, C4, D5, G1, I1
Leon	Michelle	Self	Form - Keep MoPac Local	H - 1003	A1, B1, C4, D5, G1, I1
Leoshko	Janice	Self	Email - Keep MoPac Local	H - 564	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Leslie	Laura	Self	Form - Keep MoPac Local	H - 757	A1, B1, C4, D5, G1, I1
Leslie	Laura	Self	Form - Keep MoPac Local	H - 848	A1, B1, C4, D5, G1, I1
Leslie	Laura	Self	Email - Keep MoPac Local	H - 565	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Lesniak	Chuck	Self	Webmail	H - 182	L1
Levenson	Jerry	Self	Email - Keep MoPac Local	H - 566	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Levinson	Leila	Self	Email - Keep MoPac Local	H - 567	A1, A2, A3, A7, B1, C1, C4, D5, G1, H1, H2, I3
Lindsley	Jane	Self	Email - Keep MoPac Local	H - 568	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Lipp	Harry	Self	Form - Keep MoPac Local	H - 828	A1, B1, C4, D5, G1, I1
Litz	Suzanne	Self	Form - Keep MoPac Local	H - 789	A1, B1, C4, D5, G1, I1
London	F.	Self	Form - Keep MoPac Local	H - 922	A1, B1, C4, D5, G1, I1
Long	Jennifer	Self	Email - Keep MoPac Local	H - 569	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Longfellow	Michael	Self	Form - Keep MoPac Local	H - 790	A1, B1, C4, D5, G1, I1
Loosen	Charles	Self	Webmail	H - 118	A6, B1, C4, D3, D5, I1, J1, J4
Lopez	Nancy	Self	Form - Keep MoPac Local	H - 978	A1, B1, C4, D5, G1, I1
Lozada	Elizabeth	Self	Form - Keep MoPac Local	H - 852	A1, B1, C4, D5, G1, I1
Lubomudrov	Andrei	Self	Webmail	H - 131	A4, C2
Lucas	Marcia	Self	Form - Keep MoPac Local	H - 780	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Luecke	Martin	Self	Email - Keep MoPac Local	H - 570	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Lueth	Robbie	Self	Email - Keep MoPac Local	H - 571	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Luker	Betty	Self	Webmail	H - 152	A1, A2, C5, D5, G1, J2, L1
Luker-Foreman	Betina	Self	Webmail	H - 188	A1, A2, C5, G4, H2
Luker-Foreman	Betina	Self	Webmail	H - 189	A1, A2, C5, G4, H2
Luker-Foreman	Betina	Self	Webmail	H - 189	A1, A2, C5, G4, H2
Lusk	Becca	Self	Webmail	H - 141	A1, A2, A3, A6, C4, H1, H2, J3
Luton	Pamela Susan	Self	Email - Keep MoPac Local	H - 572	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
M	D	Self	Email - Keep MoPac Local	H - 396	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mabry	Alice	Self	Email - Keep MoPac Local	H - 573	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mabry	Alice	Self	Webmail	H - 123	A2, A3, B4, C4, D5, G1, H2, J1
Maceo	Peggy	Self	Email - Keep MoPac Local	H - 574	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mackenzie	Lee	Self	Email - Keep MoPac Local	H - 575	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, J1, J2
Mackie	Darius	Self	Form - Keep MoPac Local	H - 900	A1, B1, C4, D5, G1, I1
Mackintosh	Eric	Self	Form - Keep MoPac Local	H - 1006	A1, B1, C4, D5, G1, I1
Maffei	Katy	Self	Webmail	H - 164	A1, A6, C6
Maffei	John	Self	Webmail	H - 166	A1, A2, A7, C6
Magor	Kathleen	Self	Email - Keep MoPac Local	H - 576	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Maier	Richard	Self	Webmail	H - 146	C5, D5, G1, G4
Malone	Justin	Self	Form - Keep MoPac Local	H - 974	A1, B1, C4, D5, G1, I1
Mann	J	Self	Webmail	H - 149	C5
Mansfield	Kye	Self	Email - Keep MoPac Local	H - 577	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Mantia	David	Self	Email - Keep MoPac Local	H - 578	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mantooth	Jeremy	Self	Email - Keep MoPac Local	H - 579	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Marchetti	Joseph	Self	Form - Keep MoPac Local	H - 761	A1, B1, C4, D5, G1, I1
Marshall	Samantha	Self	Form - Keep MoPac Local	H - 1027	A1, B1, C4, D5, G1, I1
Marshall	Norman L.	SOS Alliance	Letter	H - 332	A1, A2, A3, A5, A6, B1, B6, E1, H1, H2, J1, J2, L1
Martin	Alton	Self	Email - Keep MoPac Local	H - 582	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Martin	Elle	Self	Email - Keep MoPac Local	H - 580	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Martin	Sharon	Self	Email - Keep MoPac Local	H - 581	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mason	Richard	Self	Email - Keep MoPac Local	H - 583	A1, A2, B1, C2, C4
Mason	Susanne	Self	Email - Keep MoPac Local	H - 584	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Matheney	Clark	Self	Webmail	H - 122	A3, C6
Mather	Jean Allen	Self	Email - Keep MoPac Local	H - 585	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Matthews	Steve	Self	Webmail	H - 120	A2, C5
Matthys	Lloyd	Self	Comment Form	H - 49	A1, A7, C5
Mauldin	Sandra	Self	Webmail	H - 120	
Mauzy	Renee	Self	Comment Form	H - 50	C5
May	Eliza	Self	Form - Keep MoPac Local	H - 950	A1, B1, C4, D5, G1, I1
May	Paula	Self	Email - Keep MoPac Local	H - 586	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mazurek	Eddie	Self	Webmail	H - 162	A1, C6
McAvay	Scott	Self	Comment Form	H - 51	A2
McCarthy	Quinn	Self	Form - Keep MoPac Local	H - 960	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
McClendan	Lewis	Self	Form - Keep MoPac Local	H - 972	A1, B1, C4, D5, G1, I1
McCormick	Donna Beth	Self	Email - Keep MoPac Local	H - 588	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McCoy	Amelia	Self	Email - Keep MoPac Local	H - 589	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McCoy	Roy	Self	Email - Keep MoPac Local	H - 590	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McDonald	Nancy	Self	Verbal	I - 51	A6, C6, D5, G1
McDonals	Susan	Self	Email - Keep MoPac Local	H - 591	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McDowell	Liz	Self	Form - Keep MoPac Local	H - 861	A1, B1, C4, D5, G1, I1
McDowell	Ken	Self	Webmail	H - 170	A1, A2, A3, C2
McGarrity	Monica	Self	Form - Keep MoPac Local	H - 885	A1, B1, C4, D5, G1, I1
McGee	George V.	Self	Form - Keep MoPac Local	H - 895	A1, B1, C4, D5, G1, I1
McGiffert	Lisa	Self	Email - Keep MoPac Local	H - 592	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McGonagle	Alexandra	Self	Form - Keep MoPac Local	H - 970	A1, B1, C4, D5, G1, I1
McKar	Rojer	Self	Email - Keep MoPac Local	H - 593	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McKenzie	Gary R.	Self	Letter	H - 345	A1, A2, A3, B1, L1
Mckenzie	Gary	Self	Webmail	H - 129	C4
McKinney	Susan	Self	Email - Keep MoPac Local	H - 594	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McKnight	Sheri	Self	Email - Keep MoPac Local	H - 595	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
McLean	William	Self	Webmail	H - 122	A2, C5
McLemore	Denise	Self	Form - Keep MoPac Local	H - 943	A1, B1, C4, D5, G1, I1
McClure	Lori	Self	Email - Keep MoPac Local	H - 587	A1, A2, A3, A7, B1, B6, C1, C4, D5, G1, H2, I3
McMillan	Judy	Self	Email - Keep MoPac Local	H - 596	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
McWhorter	Kathleen	Self	Email - Keep MoPac Local	H - 597	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Meacham	Bill	Self	Email - Keep MoPac Local	H - 598	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Meacham	Bill	Self	Webmail	H - 130	B1, C4, G1
Meadows	Jenny	Self	Email - Keep MoPac Local	H - 599	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mehner	Colleen	Self	Email - Keep MoPac Local	H - 600	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Meinkoth	Kat	Self	Form - Keep MoPac Local	H - 865	A1, B1, C4, D5, G1, I1
Melder	Barbara/Bobbie	Self	Email - Keep MoPac Local	H - 601	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Melder	Bobbie	Self	Form - Keep MoPac Local	H - 1047	A1, B1, C4, D5, G1, I1
Melton	Bruce	Self	Webmail	H - 151	B1, D1, D2, D3, D4, D5, G1, L1
Mendoza	Nicolas	Self	Form - Keep MoPac Local	H - 1013	A1, B1, C4, D5, G1, I1
Mendoza Sanchez	Erika	Self	Form - Keep MoPac Local	H - 1004	A1, B1, C4, D5, G1, I1
Menschig	Marian	Self	Form - Keep MoPac Local	H - 997	A1, B1, C4, D5, G1, I1
Mercier	Madeleine	Self	Email - Keep MoPac Local	H - 602	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Michener	Kristi	Self	Webmail	H - 118	A1, C6, I1
Mickelson	Shannon	Self	Webmail	H - 146	C6, L1
Miers	Helen	Self	Webmail	H - 164	A1, A2, A5, A7
Millard	Nancy	Self	Email - Keep MoPac Local	H - 603	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Miller	Karen	Self	Email - Keep MoPac Local	H - 604	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Miller	Donna	Self	Comment Form	H - 52	B1, C4, D5, G1
Miller	Margaret	Self	Form - Keep MoPac Local	H - 923	A1, B1, C4, D5, G1, I1
Miller	Matt	Self	Form - Keep MoPac Local	H - 984	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Miller	Kent	Self	Webmail	H - 125	C4, G1, J1, J2
Miller	Kathi	Self	Webmail	H - 126	A1, C4, G1
Miller	Troy	Self	Webmail	H - 159	A3, C6
Millian	Andra	Self	Email - Keep MoPac Local	H - 605	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mills	Amy	Self	Webmail	H - 140	C1, C4, G1
Minnich	John	Self	Form - Keep MoPac Local	H - 1043	A1, B1, C4, D5, G1, I1
Minot	Samuel	Self	Email - Keep MoPac Local	H - 606	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Mixon	Gay	Self	Webmail	H - 187	A6, C6, J2
Mlotok	Marion	Self	Verbal	I - 46	A1, A5, C1, C4, D5
Modhuijsen	Irene	Self	Form - Keep MoPac Local	H - 1028	A1, B1, C4, D5, G1, I1
Moffat	Susan	Self	Email - Keep MoPac Local	H - 607	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Montalvo	Elena	Self	Email - Keep MoPac Local	H - 608	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Montgomery	Jill	Self	Form - Keep MoPac Local	H - 876	A1, B1, C4, D5, G1, I1
Moore	Christopher	Self	Email - Keep MoPac Local	H - 609	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Moore	Graham	Self	Comment Form	H - 53	A6, C5, D5, G1
Moreno	Diego	Self	Form - Keep MoPac Local	H - 938	A1, B1, C4, D5, G1, I1
Morgan	Judith	Self	Form - Keep MoPac Local	H - 1058	A1, B1, C4, D5, G1, I1
Morgan	M	Self	Webmail	H - 188	C4, J2
Morris	Kay	Self	Email - Keep MoPac Local	H - 610	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Morris	Ed	Self	Form - Keep MoPac Local	H - 796	A1, B1, C4, D5, G1, I1
Morris	Rico	Self	Form - Keep MoPac Local	H - 1014	A1, B1, C4, D5, G1, I1
Morris	Miguel	Self	Verbal	I - 43	A6, C6

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Morrison	Councilmember Laura	City of Austin	Verbal	I - 37	B1, C4, D1, D5, G1, G2, E1, E2
Morrow	Donna	Self	Email - Keep MoPac Local	H - 612	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Morrow	Robert	Self	Email - Keep MoPac Local	H - 611	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Morse	Meredith	Self	Form - Keep MoPac Local	H - 1050	A1, B1, C4, D5, G1, I1
Morse	Meredith	Self	Verbal	I - 2	B1, B4, C1, D5, G1
Moseley	James	Self	Verbal	I - 85	A1, A2, A7
Moulin	Bryan	Self	Comment Form	H - 55	A2, A3, A7, C6
Mullen	CC	Self	Email - Keep MoPac Local	H - 613	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Munroe	Molly K.	Self	Email - Keep MoPac Local	H - 614	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Murphree	Patricia	Self	Email	H - 115	C4, D5, G1, F1, F2, H4
Murphy	Deborah	Self	Comment Form	H - 56	A1, A2, B1, G1, I1
Murray	Edna	Self	Email - Keep MoPac Local	H - 615	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Musat	Vincent	Self	Webmail	H - 119	A2, A3, C6, L2
Myers	Steve	Self	Comment Form	H - 60	A2, C3
Myers	Ashley	Self	Form - Keep MoPac Local	H - 896	A1, B1, C4, D5, G1, I1
Myhre	Julie	Self	Comment Form	H - 57	A4, A6, A7, B1, C2, D3, E2, F2, G1, H1, I1, J4, K1, L1
Myhre	Julie	Self	Verbal	I - 55	A1, A4, A6, C2, C6, E2, G1, I1, J4
Myhre	Julie	Self	Webmail	H - 143	H1, L1
NA	Brian	Self	Email - Keep MoPac Local	H - 616	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	David	Self	Email - Keep MoPac Local	H - 617	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	Elenore	Self	Email - Keep MoPac Local	H - 618	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	Mary	Self	Email - Keep MoPac Local	H - 619	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
NA	Courtney	Self	Comment Form	H - 109	A2, D5, E2, G1, H1, H2, J4
NA	NA	Self	Comment Form	H - 110	C6
NA	NA	Self	Comment Form	H - 111	D1, D5, E1, E2, F1, F2, G1, H2
NA	Matt	Self	Email - Keep MoPac Local	H - 620	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	Patty	Self	Form - Keep MoPac Local	H - 849	A1, B1, C4, D5, G1, I1
NA	Michael	Self	Email - Keep MoPac Local	H - 621	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	Texans Against Tolls	Self	Email - Keep MoPac Local	H - 747	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
NA	Wilbert	Self	Email - Keep MoPac Local	H - 622	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Nagle	Suzanne M.	Self	Email - Keep MoPac Local	H - 623	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Nalle	Camille	Self	Email - Keep MoPac Local	H - 624	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Napolitano	Andrew	Self	Form - Keep MoPac Local	H - 940	A1, B1, C4, D5, G1, I1
Nappi	Chris	Self	Comment Form	H - 61	A1, A3, A6, C5, G1, G4, J4
Nappier	Amy	Self	Form - Keep MoPac Local	H - 803	A1, B1, C4, D5, G1, I1
Nash	John	Self	Webmail	H - 120	C5
Navarro	Jimmy	Self	Webmail	H - 163	A1, A2, A3, B5, C3, I1, J2
Nazor	Dr. Craig	Sierra Club Conservation Committee	Email - Keep MoPac Local	H - 625	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3, L1
Nazor	Dr. Craig	Sierra Club Conservation Committee	Verbal	I - 66	C2, C4, D5, E1, E2, G1, J2, L2
Needham	M	Self	Webmail	H - 121	C1, C2, D5
Nelson	Taylor	Self	Form - Keep MoPac Local	H - 830	A1, B1, C4, D5, G1, I1
Nelson	Cris	Self	Webmail	H - 125	C2, G1, G4, J1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Nelson	Taylor	Self	Webmail	H - 155	B1, D1, D2, D3, D4, D5, E1, E2, F1, F2, G1, G2, H1, L1
Nev	Ed	Self	Form - Keep MoPac Local	H - 1031	A1, B1, C4, D5, G1, I1
Newcomb	Brian	Self	Form - Keep MoPac Local	H - 954	A1, B1, C4, D5, G1, I1
Ng	Desmond	Self	Email - Keep MoPac Local	H - 626	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ng	Desmond	Self	Webmail	H - 129	A1, A2, B1, B6, G1
Nguyeb	Truc	Self	Email - Keep MoPac Local	H - 627	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Nguyen	Michelle	Self	Form - Keep MoPac Local	H - 898	A1, B1, C4, D5, G1, I1
Nick	Garret	Self	Webmail	H - 128	C1, C2, C4, D5, G1
Nienhuis	Lisa	Self	Form - Keep MoPac Local	H - 995	A1, B1, C4, D5, G1, I1
Noches	Ramon	Self	Comment Form	H - 62	I3, L1
Nodine	Karl	Self	Comment Form	H - 63	A1, A2, A7, C3
Norman	Alecia	Self	Form - Keep MoPac Local	H - 1036	A1, B1, C4, D5, G1, I1
Noyd	Jay	Self	Form - Keep MoPac Local	H - 992	A1, B1, C4, D5, G1, I1
Nunnally	Rex	Self	Email - Keep MoPac Local	H - 628	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Nye	Janel	Self	Email - Keep MoPac Local	H - 629	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Obregon	Ben	Self	Email - Keep MoPac Local	H - 630	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
O'Brien	Kristen	Self	Form - Keep MoPac Local	H - 1068	A1, B1, C4, D5, G1, I1
Odom	Larry	Self	Comment Form	H - 64	A1, C5, I1, G4
Odom	Larry	Self	Webmail	H - 138	A1, C5, G1, G4, I1, I3
Oen	Christine	Self	Form - Keep MoPac Local	H - 864	A1, B1, C4, D5, G1, I1
Olah	Ray	Self	Webmail	H - 148	A1, A2, A3, C4

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Olinde	Lindsay	Self	Email - Keep MoPac Local	H - 631	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Opp	Kevin	Self	Form - Keep MoPac Local	H - 1039	A1, B1, C4, D5, G1, I1
Ordonez	Lenore	Self	Webmail	H - 161	A1, A2, A6, A7, J2
Orr	Richard	Self	Email - Keep MoPac Local	H - 632	A1, A2, A3, A7, B1, C1, C2, C4, D5, G1, H2, I3
Orrantia	Marco	Self	Email - Keep MoPac Local	H - 633	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Orrantia	Marco Antonio	Self	Form - Keep MoPac Local	H - 1073	A1, B1, C4, D5, G1, I1
Osborne	Rusty	Self	Email - Keep MoPac Local	H - 634	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Osmany	Anwar	Self	Email - Keep MoPac Local	H - 635	A1, A2, A3, A7, B1, C1, C3, C4, D5, G1, H2, I3
Otstott	Aaron	Self	Webmail	H - 164	A1, A2, A5, C4, D1, D2, D3, D4, D5, G1, G4, H1, J1
Pace	Stuart	Self	Webmail	H - 159	B1, B4, C4
Pain	Michele	Self	Form - Keep MoPac Local	H - 868	A1, B1, C4, D5, G1, I1
Paine	Margaret	Self	Email - Keep MoPac Local	H - 636	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Palestina	Robert	Self	Form - Keep MoPac Local	H - 1007	A1, B1, C4, D5, G1, I1
Palmira-Ross	Sophia	Self	Form - Keep MoPac Local	H - 971	A1, B1, C4, D5, G1, I1
Pantell	Susan	Self	Webmail	H - 138	A1, A2, A3, A7, B1, B6, C1, C2, C4, L2
Park	Kyu	Self	Form - Keep MoPac Local	H - 758	A1, B1, C4, D5, G1, I1
Parker	Martin	Self	Email - Keep MoPac Local	H - 637	A1, A2, A3, A7, B1, C1, C4, D1, D5, G1, H2, I3
Parks	Aaron	Self	Email - Keep MoPac Local	H - 638	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Parsons	Brad	Self	Email - Keep MoPac Local	H - 639	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Parsons	Ashley	Self	Webmail	H - 127	A4, C3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Parten	Joshua	Self	Webmail	H - 139	A1, C6, G1, G4
Pascoe	Susan	Self	Email - Keep MoPac Local	H - 640	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Patman	Jason	Self	Verbal	I - 72	D1, D5, E2, G1, L1
Patteson	Stephanie	Self	Email - Keep MoPac Local	H - 641	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Paul	Lisa	Self	Form - Keep MoPac Local	H - 1051	A1, B1, C4, D5, G1, I1
Pearson	Rick	Self	Email - Keep MoPac Local	H - 642	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Peebles	Lindsey	Self	Email - Keep MoPac Local	H - 643	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Peoples	Wes	Self	Webmail	H - 121	A1, A2, A6, C5
Pereyo	Spiro	Self	Form - Keep MoPac Local	H - 853	A1, B1, C4, D5, G1, I1
Perez	Jason	Self	Email - Keep MoPac Local	H - 644	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Perez	Mark	Self	Form - Keep MoPac Local	H - 819	A1, B1, C4, D5, G1, I1
Perkins	Julie	Self	Email - Keep MoPac Local	H - 645	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Perkins	Rick	Self	Verbal	I - 60	B5, C6, D3, D5
Perkins	Julie	Self	Webmail	H - 117	A1, A2, A7, C3, J1
Pharis, IV	William	Self	Form - Keep MoPac Local	H - 925	A1, B1, C4, D5, G1, I1
Phillips	Cindy	Self	Email - Keep MoPac Local	H - 646	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Phillips	Hope	Self	Webmail	H - 168	B1, B4, C4, D1, D2, D3, D4, D5, F1, F2, G1, G4, H1, H4, I3
Pimentel	David	Self	Webmail	H - 182	D1, D2, D3, D4, D5, I1, L1
Pinataro	Jerry	Self	Form - Keep MoPac Local	H - 777	A1, B1, C4, D5, G1, I1
Pinataro	Candace	Self	Form - Keep MoPac Local	H - 778	A1, B1, C4, D5, G1, I1
Pion	Brian	Self	Form - Keep MoPac Local	H - 826	A1, B1, C4, D1, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Pitt	Tara	Self	Form - Keep MoPac Local	H - 1062	A1, B1, C4, D5, G1, I1
Platt	Owen	Self	Form - Keep MoPac Local	H - 937	A1, B1, C4, D5, G1, I1
Ploeger	Kristen	Self	Letter	H - 346	A2, C3, L1
Pogonat	Teodora	Self	Webmail	H - 140	A1, A2, A6, C1, H1, I1, L1
Pomeroy	Chris	Self	Email - Keep MoPac Local	H - 647	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Pool	Leslie	Self	Form - Keep MoPac Local	H - 1054	A1, B1, C4, D5, G1, I1
Pooper	Richard	Self	Email - Keep MoPac Local	H - 648	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Potter	Deborah L	Self	Email - Keep MoPac Local	H - 649	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Pousson	Paul	Self	Webmail	H - 168	A1, A2, A6, C6, G1
Prager, PhD	Herman	Self	Email - Keep MoPac Local	H - 650	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Presley	Laura	Self	Form - Keep MoPac Local	H - 750	A1, B1, C4, D5, G1, I1
Prevost	Ashley	Self	Form - Keep MoPac Local	H - 837	A1, B1, C4, D5, G1, I1
Price	Lynda	Self	Form - Keep MoPac Local	H - 874	A1, B1, C4, D5, G1, I1
Price	Thomas	Self	Webmail	H - 129	A1, A2, A3, B6, C4, G1
Prichard	Casey	Self	Form - Keep MoPac Local	H - 1040	A1, B1, C4, D5, G1, I1
Primosic	Don	Self	Webmail	H - 140	A1, A2, A7, L1
Pruitt	Claire	Self	Form - Keep MoPac Local	H - 982	A1, B1, C4, D5, G1, I1
Quigg	Elizabeth	Self	Email - Keep MoPac Local	H - 651	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Race	David	Self	Email - Keep MoPac Local	H - 652	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Radding	Aimee	Self	Form - Keep MoPac Local	H - 860	A1, B1, C4, D5, G1, I1
Rado	Jim	Self	Webmail	H - 121	C6

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Ramirez	Guadalupe	Self	Comment Form	H - 65	A4, B6
Ramirez	Stephen	Self	Form - Keep MoPac Local	H - 815	A1, B1, C4, D5, G1, I1
Ramirez	Lynn	Self	Form - Keep MoPac Local	H - 1046	A1, B1, C4, D5, G1, I1
Ramsey	Donna	Self	Email - Keep MoPac Local	H - 653	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Rao	Raghunath	Self	Webmail	H - 163	A1, C5
Rao	Raghunath	Self	Webmail	H - 163	A1, C5
Rao	Chitra	Self	Webmail	H - 163	A1, C5
Rao	Shrinath	Self	Webmail	H - 163	A1, C5
Rao	Sankarsh	Self	Webmail	H - 163	A1, C5
Ray	Beth Ann	Austin Chamber of Commerce	Webmail	H - 149	C6
Rea	Clotilde	Self	Email - Keep MoPac Local	H - 654	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Reardon	Linda	Self	Webmail	H - 162	A1, A2, A5, A6, C6
Reburn	Clarissa	Self	Email - Keep MoPac Local	H - 655	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Reece	Ray	Self	Email - Keep MoPac Local	H - 656	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Reece	Ray	Self	Email - Keep MoPac Local	H - 657	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Reed	Janet	Self	Email - Keep MoPac Local	H - 658	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Rees	Evan	Self	Form - Keep MoPac Local	H - 986	A1, B1, C4, D5, G1, I1
Reese	Joel	Self	Form - Keep MoPac Local	H - 1049	A1, B1, C4, D5, G1, I1
Reeves	Wallace	Self	Webmail	H - 170	A1, A2, A6, A7, C6
Regan	Brian	Self	Webmail	H - 167	A1, A2, C3, F1, H1
Reichmann	Lara	Self	Form - Keep MoPac Local	H - 897	A1, B1, C4, D5, G1, I1
Reinhardt	Michelle	Self	Webmail	H - 135	A1, A6, C4, G1, G4, J2

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Reutter	Claire	Self	Form - Keep MoPac Local	H - 1070	A1, B1, C4, D5, G1, I1
Reyes	Luis	Self	Email - Keep MoPac Local	H - 659	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Reynolds	Yvette	Self	Email - Keep MoPac Local	H - 660	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ribble	John	Self	Email - Keep MoPac Local	H - 661	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ribble	John	Self	Webmail	H - 126	A5, C4, D5, E2, G1, I3
Rice	Rachel	Self	Form - Keep MoPac Local	H - 800	A1, B1, C4, D5, G1, I1
Richardson	David	Self	Comment Form	H - 66	A1, C6
Richardson	Sarah	Self	Form - Keep MoPac Local	H - 763	A1, B1, C4, D5, G1, I1
Richardson	David	Self	Webmail	H - 117	B1, B4
Ridley	Rion	Self	Webmail	H - 132	C1, C4, D5, G1
Rieff	Susan	Lady Bird Johnson Wildflower Center	Letter	H - 350	A1, A2, A6, H1, H4, J4, L1
Rigsbee	Ken	Self	Webmail	H - 131	A1, A6, C5
Riordan	Maryann	Self	Webmail	H - 139	A1, C5, D5, G1
Riordan	Maryann	Self	Webmail	H - 151	C6
Rison	Cameron	Self	Form - Keep MoPac Local	H - 1021	A1, B1, C4, D5, G1, I1
Rivera	Derly	Self	Webmail	H - 122	L1
Robbis	George	Self	Webmail	H - 161	A1, A5, C6, J2
Robertson	Allison	Self	Form - Keep MoPac Local	H - 834	A1, B1, C4, D5, G1, I1
Robinson	Gary	Self	Webmail	H - 121	C6
Robinson	Wesley	Self	Email - Keep MoPac Local	H - 662	A1, A2, A3, A5, A7, B1, B6, C1, C2, C4, D5, G1, H2, I3
Rockstead	Douglas	Self	Webmail	H - 158	A1, A2, A3, A7, C1, C6, J2
Roeder	Rob	Self	Email - Keep MoPac Local	H - 664	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Roehm	Eric	Self	Form - Keep MoPac Local	H - 953	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Rogerson	Ron	Self	Webmail	H - 148	B5, C6
Rolfes	Kevin	Self	Webmail	H - 144	A1, A2, B1, D5, G1, G4, H2, J2
Rollins	Mark	Self	Webmail	H - 129	A1, C6
Romage-Chambers	Michelle	Self	Comment Form	H - 67	A3, C6
Rose	Patrick	Self	Webmail	H - 122	A6, C6
Ross	Doug	Self	Webmail	H - 132	A1, A2, A6, C6, G1, J2, J4
Rowland	Amy	Self	Email - Keep MoPac Local	H - 665	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Rowland	Virginia	Self	Email - Keep MoPac Local	H - 666	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Rowley	John	Self	Comment Form	H - 68	A1, B1
Ruben	Jon	Self	Form - Keep MoPac Local	H - 1045	A1, B1, C4, D5, G1, I1
Ruge	Mayor Todd	City of Buda	Verbal	I - 34	C6, G1
Ruiz	David	Self	Form - Keep MoPac Local	H - 862	A1, B1, C4, D5, G1, I1
Rumelt	Andrew	Self	Email - Keep MoPac Local	H - 667	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Rupp	Amy	Self	Webmail	H - 183	A1, A2, A6, C1, C4, G1, H2, J4, I1, I3, L2
Rush	Barbara	Self	Form - Keep MoPac Local	H - 756	A1, B1, C4, D5, G1, I1
Rutgers	Adam	Self	Form - Keep MoPac Local	H - 1041	A1, B1, C4, D5, G1, I1
Ryan	Zach	Self	Comment Form	H - 69	A1, B5, C6
Ryan	Ann	Self	Webmail	H - 119	L1
Saad	Camille	Self	Email - Keep MoPac Local	H - 668	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sabo	Jason	Self	Form - Keep MoPac Local	H - 912	A1, B1, C4, D5, G1, I1
SaintRomain	Aletha	Self	Email - Keep MoPac Local	H - 669	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Salazar	Deanne	Self	Email - Keep MoPac Local	H - 670	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Sallee	Shelley	Self	Email - Keep MoPac Local	H - 671	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Saltsman	Rebecca	Self	Form - Keep MoPac Local	H - 873	A1, B1, C4, D5, G1, I1
Sanchez	Eduardo	Self	Form - Keep MoPac Local	H - 1025	A1, B1, C4, D5, G1, I1
Sandel	Morris	Self	Email - Keep MoPac Local	H - 672	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sanders	Kathleen	Self	Form - Keep MoPac Local	H - 773	A1, B1, C4, D5, G1, I1
Saucedo	Alex	Self	Form - Keep MoPac Local	H - 890	A1, B1, C4, D5, G1, I1
Saucedo	Mary	Self	Webmail	H - 158	A1, C6
Schaffer	Arnold	Self	Comment Form	H - 70	A1, A2, A6, A7, B6, I3
Schaffer	Sue	Self	Verbal	I - 2	A5, A7
Scheick	Jacob	Self	Email - Keep MoPac Local	H - 673	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Schexnayder	Patrice	Self	Webmail	H - 124	C2, C4, D5, G1, G4
Schissler	James	Self	Webmail	H - 120	A1, C6, D3, D5
Schissler	James	Self	Webmail	H - 120	A1, C6, D3, D5
Schmidli	Lisette	Self	Webmail	H - 148	A1, A2, A3, A5, A7, C4, D5, G1, G4, L2
Schmitz	Charles	Self	Webmail	H - 143	A1, C6
Schneider	Kyle	Self	Email - Keep MoPac Local	H - 674	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Schneider	Robin	Self	Form - Keep MoPac Local	H -1053	A1, B1, C4, D5, G1, I1
Schneider	Robert	Self	Webmail	H - 202	A2, A5, C6, G1, H2
Schnobrith	Steve	Self	Form - Keep MoPac Local	H - 774	A1, B1, C4, D5, G1, I1
Schrift	Angela	Self	Form - Keep MoPac Local	H - 793	A1, B1, C4, D5, G1, I1
Schwartz	Aaron	Self	Form - Keep MoPac Local	H - 1035	A1, B1, C4, D5, G1, I1
Sclerandi	Lonnie	Self	Form - Keep MoPac Local	H - 1061	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Scott	Dorinda	Self	Email - Keep MoPac Local	H - 675	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Scott	Dorinda	Self	Webmail	H - 117	B1, C4, D5, E1, E2
Scott	Dorinda	Self	Webmail	H - 122	A1, A5, C4, D3, D5, E1, E2, F1, F2, G1, J1
Scott	Robyn	Self	Webmail	H - 161	A1, A2, A6, C6, D5, H2, J2
Scruggs	Ed	Self	Verbal	I - 77	A1, A2, A6, B1, B6, C3, G1, K2
Seal	Tami	Self	Comment Form	H - 71	A1, A6, C6, H2
Seffel	Joel	Self	Webmail	H - 160	A1, C5, D2, D5, E1, K2
Segura	Iseyra	Self	Form - Keep MoPac Local	H - 824	A1, B1, C4, D5, G1, I1
Seldon	Niles	Self	Email - Keep MoPac Local	H - 676	B1, B6
Selger	Steven	Self	Comment Form	H - 72	C6, G1
Selger	Steven	Self	Webmail	H - 117	C6, G1
Sen	Indradeep	Self	Webmail	H - 139	C6
Sen	Ritu	Self	Webmail	H - 141	A1, C6
Seth, I	Mayur	Self	Comment Form	H - 73	A1, C6, I3, L1
Sexton	Michael	Self	Comment Form	H - 74	A1, A6, C6, D5, G1
Seybold	Lacy	Self	Webmail	H - 127	A1, A2, C5, D5, G1, G4, J1
Shadowen	Robert	Self	Email - Keep MoPac Local	H - 677	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Shah	V	Self	Webmail	H - 118	C6
Gres	R. Shane	Self	Form - Keep MoPac Local	H - 755	A1, B1, C4, D5, G1, I1
Sharma	B.	Self	Comment Form	H - 75	A1, L1
Shea	Brigid	Self	Email - Keep MoPac Local	H - 678	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sheehan	Molly K.	Self	Email - Keep MoPac Local	H - 679	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sheffield	Sarah	Self	Email - Keep MoPac Local	H - 680	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Shelly	Keith	Self	Form - Keep MoPac Local	H - 797	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Shelton	Todd	Self	Comment Form	H - 76	A1, B5, C6, G1
Shepperd, D.C.	Robert H.	Self	Email - Keep MoPac Local	H - 681	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sherman	Lee	Self	Email - Keep MoPac Local	H - 682	A1, A2, A3, A7, B1, C1, C4, D1, D5, G1, H2, I1, I3
Sherman	Larry	Self	Webmail	H - 169	A1, C6, J2
Shevory	Kristina	Self	Form - Keep MoPac Local	H - 855	A1, B1, C4, D5, G1, I1, J2
Shimaya	Francie	Self	Email - Keep MoPac Local	H - 683	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Shin	Chong	Self	Comment Form	H - 77	A,3, I3, L1, L2
Shirley	Paul	Self	Form - Keep MoPac Local	H - 944	A1, B1, C4, D5, G1, I1
Sietsema	David	Self	Comment Form	H - 78	A4, C6
Siler	Michael	Self	Form - Keep MoPac Local	H - 901	A1, B1, C4, D5, G1, I1
Simmons	Randy	Self	Email - Keep MoPac Local	H - 684	A3, B6, C4, D5
Simms	Cicily J.	Self	Email - Keep MoPac Local	H - 685	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Siracusa	Shelley	Self	Webmail	H - 138	C6
Skaggs	Jim	Self	Webmail	H - 123	A3, B5, C6, H2, J4
Skinner	Jose	Self	Email - Keep MoPac Local	H - 686	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Smith	Hank	Self	Comment Form	H - 79	C6, G1, L1
Smith	Thales	Self	Form - Keep MoPac Local	H - 1009	A1, B1, C4, D5, G1, I1
Smith	Carol Lynne	Self	Form - Keep MoPac Local	H - 1052	A1, B1, C4, D5, G1, I1
Smith	Brian	Barton Springs Edwards Aquifer Conservation District	Verbal	I - 39	B1, B4, C4, D1, D3, D4, D5, G3
Smith	Brant	Self	Webmail	H - 121	A2, C5
Smith	Steve C.	Self	Email - Keep MoPac Local	H - 687	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Sniff	Richard	Self	Form - Keep MoPac Local	H - 1012	A1, B1, C4, D5, G1, I1
Snow	Sarah	Self	Email - Keep MoPac Local	H - 688	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sobocinski	Jennifer	Self	Webmail	H - 151	A1, A2, C6, G1
Solomon	Jeffrey	Self	Email - Keep MoPac Local	H - 689	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Solomon	Jeffrey	Self	Webmail	H - 131	A1, A2, A6, C4
Solonenko	Alex	Self	Email - Keep MoPac Local	H - 690	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Somerville	Mary	Self	Email - Keep MoPac Local	H - 691	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Southworth	Jay	Self	Webmail	H - 129	A3, A6, C6
Spaeth	Doug	Self	Form - Keep MoPac Local	H - 1059	A1, B1, C4, D5, G1, I1
Spatcher	Lin	Self	Email - Keep MoPac Local	H - 692	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Spaw	Soo	Self	Email - Keep MoPac Local	H - 693	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Spetseris	Martha	Self	Form - Keep MoPac Local	H - 770	A1, B1, C4, D5, G1, I1
Spinello	Jamie	Self	Email - Keep MoPac Local	H - 694	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Spradley	D.	Self	Email - Keep MoPac Local	H - 695	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sprayberry	Jan	Self	Webmail	H - 146	A1, A2, A6, A7, C4, J2
St. Louis	Alfred	Self	Email - Keep MoPac Local	H - 696	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
St. Louis	Al	Self	Webmail	H - 144	A5, B1, C1, D1, D2, D3, D5, E1, G1, G4, H1, I3, L1, L2
Staff	Cameron	Self	Comment Form	H - 80	A6, C5, G1, J4
Stall	Carol	Self	Email - Keep MoPac Local	H - 697	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Stefano	Pietri	Self	Webmail	H - 126	A1, B1, C1, C3, D5, G1, I1, I2, L2
Steinberg	Jonathan	Friendship Alliance of Hays County	Comment Form	H - 81	A1, A6, B1, D1, D5, E1, G2, H4, I1, I3 J2

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Steinberg	Jonathan	Friendship Alliance of Hays County	Verbal	I - 82	A1, B1, B4, D3, D5, J1
Steinhardt	Peter	Self	Email - Keep MoPac Local	H - 698	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Stephens	Catherine	Self	Comment Form	H - 85	A1, A2, A6, A7, C3, C6, I1
Stephens	Conner	Self	Form - Keep MoPac Local	H - 795	A1, B1, C4, D5, G1, I1
Stern	Peter & Dolores	Self	Email - Keep MoPac Local	H - 699	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Stoisitz	Eric	Self	Form - Keep MoPac Local	H - 1008	A1, B1, C4, D5, G1, I1
Stokes	Ed	Self	Webmail	H - 159	C6
Stoll	Garner	Self	Webmail	H - 137	A1, A2, A4, A7, B5, C3, L1
Stone	Briana	Self	Email - Keep MoPac Local	H - 700	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Strays	Cary Alexandra	Self	Form - Keep MoPac Local	H - 1016	A1, B1, C4, D5, G1, I1
Strickland	Hal	Self	Email - Keep MoPac Local	H - 701	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Stricko	Lucina	Self	Email - Keep MoPac Local	H - 702	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Suin	Hongsup	Self	Form - Keep MoPac Local	H - 929	A1, B1, C4, D5, G1, I1
Sullivan	Johanna	Self	Email - Keep MoPac Local	H - 703	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sullivan	Johanna	Self	Email - Keep MoPac Local	H - 704	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Sullivan	Patrice	Self	Email - Keep MoPac Local	H - 705	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Summerfield	Diane	Self	Webmail	H - 162	A1, C6
Surina	Matt	Self	Comment Form	H - 87	A6, A7, C4, I3
Surina	Matt	Self	Verbal	I - 59	A2, A6, A7, C3
Susuiod	Paul	Self	Form - Keep MoPac Local	H - 762	A1, B1, C4, D5, G1, I1
Swales	Olivia	Self	Form - Keep MoPac Local	H - 844	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Swartz	Michael	Self	Webmail	H - 167	A1, A7, L1, L2
Swartz	Michael	Self	Webmail	H - 142	A5, A7
Swearingen	Edward	Self	Webmail	H - 129	A2, I1, L2
Swon	NA	Self	Form - Keep MoPac Local	H - 804	A1, B1, C4, D5, G1, I1
Sylvie	Amanda	Self	Webmail	H - 152	A3, A7, L1
Sylvie	Amanda	Self	Webmail	H - 164	A1, A2, A3, A6, C2, C4, J2
Symington	Cindy	Self	Webmail	H - 125	I1, L1
Taisoada	Jorge	Self	Form - Keep MoPac Local	H - 825	A1, B1, C4, D5, G1, I1
Talley	Monroe	Self	Email - Keep MoPac Local	H - 706	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Taylor	Cameron	Self	Form - Keep MoPac Local	H - 791	A1, B1, C4, D5, G1, I1
Taylor	Daniel	Self	Form - Keep MoPac Local	H - 833	A1, B1, C4, D5, G1, I1
Tefft	Robby	Self	Comment Form	H - 88	A1, A7, C6
Temple	Kayci	Self	Webmail	H - 157	A1, A2, A7, C4, I3
Tennison	Susan	Self	Comment Form	H - 89	C6, H1
Tennison	Susan	Self	Comment Form	H - 90	E2, H1
Tennison	Susan	Self	Verbal	I - 61	A2, C6, E2, H1
Tenorio	Mike	Self	Verbal	I - 109	A1, B1, B6
Tenorio	Mike	Self	Webmail	H - 135	A1, A3, C2, C4, D5, L1
Teyler	Meredyth	Self	Form - Keep MoPac Local	H - 1000	A1, B1, C4, D5, G1, I1
Thayer	Thomas	Self	Webmail	H - 145	A1, A3, B1, C1, D5, F1, F2, G1, H1, H4
Theriot	Colleen	Self	Email - Keep MoPac Local	H - 707	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Therrell	Ryan	Self	Webmail	H - 125	A2, C5
Thill	Linda	Self	Comment Form	H - 91	A1, C5
Thomas	Mikaela	Self	Email - Keep MoPac Local	H - 708	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Thomas	Phil	Self	Email - Keep MoPac Local	H - 710	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Thomas	Mark	Self	Webmail	H - 134	C4, G1, D5
Thomas	T	Self	Email - Keep MoPac Local	H - 709	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Thompsom	David	Self	Email - Keep MoPac Local	H - 711	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Thompson	Mark	Self	Email - Keep MoPac Local	H - 712	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Thompson	Richard	Self	Comment Form	H - 92	A2, A3, C6
Thompson	Dan	Self	Form - Keep MoPac Local	H - 903	A1, B1, C4, D5, G1, I1
Thompson	Claudia	Self	Form - Keep MoPac Local	H - 904	A1, B1, C4, D5, G1, I1
Thompson	Mark	Self	Webmail	H - 141	C4
Thomsen	Scott	Self	Email - Keep MoPac Local	H - 713	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Thrailkill	Paul	Self	Email - Keep MoPac Local	H - 714	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Tiemann	Donna	Self	Comment Form	H - 93	B1, C4, D5, G1, G2, G3, I3
Tingle	Dennis	Self	Verbal	I - 69	A1, A2, A5, B6, H2
Tisdale	Ward	Self	Webmail	H - 121	C5, H2, J4
Todd	Kevin	Self	Comment Form	H - 94	C5, G1
Todd	Deborah	Self	Form - Keep MoPac Local	H - 831	A1, B1, C4, D5, G1, I1
Todd	Kevin	Self	Webmail	H - 131	C5, G1
Tom	Pauline	Self	Webmail	H - 131	A6, C6, J4
Tom	Pauline	Self	Webmail	H - 131	L1
Tomasek	Kevin	Self	Webmail	H - 117	A1, C5, G4
Tomasek	Kevin	Self	Webmail	H - 150	A1, A5, C2, C5, G4, H4, I1, I3, J4, L1
Tongate	John	Self	Email - Keep MoPac Local	H - 715	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Torgrimson	Carol	Self	Email - Keep MoPac Local	H - 716	A1, A6, B1, C4, D5, G1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Torgrimson	Peter	Self	Email - Keep MoPac Local	H - 717	A1, B1, C4, D5
Town	William	Self	Form - Keep MoPac Local	H - 1067	A1, B1, C4, D5, G1, I1
Tracy	Joe	Self	Webmail	H - 120	A2, C5
Trahan	Paul	Self	Webmail	H - 142	I1, I2, I3, L1
Tran	Kathy	Self	Form - Keep MoPac Local	H - 880	A1, B1, C4, D5, G1, I1
Troxclair	Ellen	State Rep. Jason Isaac	Verbal	I - 36	C6, G1
Trusty	Robbin	Self	Form - Keep MoPac Local	H - 988	A1, B1, C4, D5, G1, I1
Tucek	Bob	Self	Comment Form	H - 95	D1
Tucker	Mitchell	Self	Form - Keep MoPac Local	H - 1001	A1, B1, C4, D5, G1, I1
Tucker	William	Self	Webmail	H - 145	A1, A2, B1, C2, C4, F1, F2, G1, H1, H4, J2
Tucker	William	Self	Webmail	H - 154	A1, A2, J2, L1
Turnbow	Rebecca	Self	Form - Keep MoPac Local	H - 913	A1, B1, C4, D5, G1, I1
Turner	Natalie	Self	Email - Keep MoPac Local	H - 718	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Turpin	Ian	Self	Webmail	H - 122	A2, C5
Tuttrup	Neal	Self	Form - Keep MoPac Local	H - 752	A1, B1, C4, D5, G1, I1
TX	Austin	Self	Form - Keep MoPac Local	H - 891	A1, B1, C4, D5, G1, I1
TX	Victoria	Self	Form - Keep MoPac Local	H - 1029	A1, B1, C4, D5, G1, I1
Usakewicz	Jeffrey	Self	Comment Form	H - 96	A1, A3, A5, A6, C5, G1
V.	Apryl	Self	Email - Keep MoPac Local	H - 719	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Valdez	Alexander Brian	Self	Form - Keep MoPac Local	H - 1044	A1, B1, C4, D5, G1, I1
Valdez	Renee	Self	Webmail	H - 182	A1, A2, A7, C6

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Valls-Trelles	Pat	Self	Email - Keep MoPac Local	H - 720	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Van Laar	Elly	Self	Form - Keep MoPac Local	H - 920	A1, B1, C2, C4, D5, G1, I1
Vanek	Dana	Self	Form - Keep MoPac Local	H - 996	A1, B1, C4, D5, G1, I1
Vega	Maricela	Self	Form - Keep MoPac Local	H - 919	A1, B1, C4, D5, G1, I1
Vela	Alejandra	Self	Email - Keep MoPac Local	H - 721	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Velazquez	Benjamin	Self	Form - Keep MoPac Local	H - 981	A1, B1, C4, D5, G1, I1
Velmala	Sateesh	Self	Webmail	H - 165	A1, C6
Veloz	Divinity	Self	Form - Keep MoPac Local	H - 976	A1, B1, C4, D5, G1, I1
Villarreal	Danny	Self	Webmail	H - 139	A1, C6
Vinson	Greg	Self	Form - Keep MoPac Local	H - 1063	A1, B1, C4, D5, G1, I1
Violand	Paul	Self	Form - Keep MoPac Local	H - 1060	A1, B1, C4, D5, G1, I1
Vitems	Matthew	Self	Form - Keep MoPac Local	H - 810	A1, B1, C4, D5, G1, I1
Vogel	Caroyn	Self	Email - Keep MoPac Local	H - 722	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Vogel	Lori	Self	Comment Form	H - 98	A6
Volpe	Lauren	Self	Form - Keep MoPac Local	H - 966	A1, B1, C4, D5, G1, I1
Volz	Candace	Self	Email - Keep MoPac Local	H - 723	A1, A2, A3, A7, B1, C1, C2, C4, D5, G1, G4, H1, H2, I3
Voss	Jennifer	Self	Webmail	H - 136	A1, A2, B1, B4, B6, C2, C4, D1, D5, F1, F2, G1, G4, H1, H2, H4, J4
Waddell	Evan	Self	Form - Keep MoPac Local	H - 915	A1, B1, C4, D5, G1, I1
Wade	Joan	Self	Email - Keep MoPac Local	H - 724	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Waldhauser	Kurt	Self	Email - Keep MoPac Local	H - 725	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Waley	Roy	Sierra Club - Austin Regional Group, Keep Mopac Local	Verbal	I - 53	A1, C1, C4, D1, D5, G1
Wallace	Lee	Self	Form - Keep MoPac Local	H - 779	A1, B1, C4, D5, G1, I1
Walrath	Suzanne	Self	Email - Keep MoPac Local	H - 726	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Warburton	Rachel	Self	Form - Keep MoPac Local	H - 843	A1, B1, C4, D5, G1, I1
Warmbrodt	Tom	Self	Webmail	H - 187	C4, L1
Washington	Taylor	Self	Form - Keep MoPac Local	H - 841	A1, B1, C4, D5, G1, I1
Watkins	Mariah	Self	Webmail	H - 158	A1, A2, A3, D5, I3, L1
Watkins	Mariah	Self	Webmail	H - 125	A1, A3, B1, C4, D5, G1, I3
Watrobka	Cheryl	Self	Comment Form	H - 99	A2, A6, C3
Watson	Jan	Self	Comment Form	H - 100	A3, C6
Watts	Allison	Self	Verbal	I - 115	A1, A6, C6, D5, H2
Weaver	William	Self	Email - Keep MoPac Local	H - 727	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Weedon Trepanier	Shelley	Self	Email - Keep MoPac Local	H - 728	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Weinroth	Adam	Self	Email - Keep MoPac Local	H - 729	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Weinstein	David	Self	Form - Keep MoPac Local	H - 818	A1, B1, C4, D5, G1, I1
Weiss	Esther	Self	Form - Keep MoPac Local	H - 939	A1, B1, C4, D5, G1, I1
Welch	Kerri	Self	Webmail	H - 128	A1, B1, D5, C1, C2, C4, I3
Welch	Ron	Self	Comment Form	H - 101	A1, C3
Werbner	Stuart	Self	Email - Keep MoPac Local	H - 746	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Werchan	Alice	Self	Webmail	H - 142	A1, A6, C3, C5, L1
Werchan	Alice	Self	Webmail	H - 188	A1, A6, C5
West	Tammy	Self	Form - Keep MoPac Local	H - 1019	A1, B1, C4, D5, G1, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Whalen	Bette	Self	Webmail	H - 167	A1, A2, A6, C6
Wheeler	Dianne	Self	Email - Keep MoPac Local	H - 730	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
White	Kaiba	Self	Email - Keep MoPac Local	H - 731	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
White	Molly	Self	Form - Keep MoPac Local	H - 771	A1, B1, C4, D5, G1, I1
White	Jon	Travis County	Webmail	H - 177	A2, A4, A6, B1, D1, D2, D3, D4, D5, E1, E2, F2, G1, G2, G4, H1, K1, L1
Whiteside	Pat	Self	Email - Keep MoPac Local	H - 732	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Whitfield	Gail	Self	Comment Form	H - 102	C5
Whitfield	Marcus	Self	Comment Form	H - 103	A1, A2, C6
Whitfield	Marcus	Self	Verbal	I - 45	C5, D1
Whitley	Kody	Self	Form - Keep MoPac Local	H - 959	A1, B1, C4, D5, G1, I1
Whitney	Daniel	Self	Form - Keep MoPac Local	H - 788	A1, B1, C4, D5, G1, I1
Wick	James	Self	Form - Keep MoPac Local	H - 1071	A1, B1, C4, D5, G1, I1
Wilcox	Cynthia	Self	Email - Keep MoPac Local	H - 733	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Wilkerson	Eric	Self	Email - Keep MoPac Local	H - 734	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Williams	Michael	Self	Email - Keep MoPac Local	H - 735	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I1, I3
Williams	Lisa	Self	Comment Form	H - 104	A1, C1, C3, C4, I3
Williamson	Don A.	Self	Email - Keep MoPac Local	H - 736	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Williamson	Lonnette	Self	Form - Keep MoPac Local	H - 829	A1, B1, C4, D5, G1, I1
Wilson	David	Self	Comment Form	H - 105	A1, A2, A7
Wilton	Brooke	Self	Email - Keep MoPac Local	H - 737	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Withrow	Heather	Self	Webmail	H - 183	A1, A2, A6, A7, C2, C4, I1

Table 1:SH 45SW Commenter Index

Last Name	First Name	Representing	Type Received	Comment Location (H - Written, I - Verbal)	Comment Response Category (See Table 2)
Witt	Charles	Self	Email - Keep MoPac Local	H - 738	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Wolszon	Michael	Self	Email - Keep MoPac Local	H - 739	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Wong	Alex	Self	Form - Keep MoPac Local	H - 759	A1, B1, C4, D5, G1, I1
Woodfin	Max	Self	Email - Keep MoPac Local	H - 740	B1, C4, D5
Worley	Sandra	Self	Comment Form	H - 106	A1, C6, L1
Worley	Dennis	Self	Comment Form	H - 107	A1, C5
Worthington	Lindsey	Self	Form - Keep MoPac Local	H - 983	A1, B1, C4, D5, G1, I1
Wray	Stefan	Self	Form - Keep MoPac Local	H - 1072	A1, B1, C4, D5, G1, I1
Wright	Winston	Self	Form - Keep MoPac Local	H - 811	A1, B1, C4, D5, G1, I1
Wyman	Cary	Self	Verbal	I - 79	A1, C1, C4
Yeo	Sue	Self	Form - Keep MoPac Local	H - 927	A1, B1, C4, D5, G1, I1
Young	Doug	Self	Email - Keep MoPac Local	H - 741	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Young	Cat	Self	Verbal	I - 68	A1, A5, C5, E1, H2
Zakes	Joe	Self	Email - Keep MoPac Local	H - 742	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Zamarripa	Ricardo	Self	Comment Form	H - 108	C6
Zearfoss	Terri	Self	Webmail	H - 139	C6
Zhong	Shi	Self	Email - Keep MoPac Local	H - 743	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Ziegler	Leigh	Self	Email - Keep MoPac Local	H - 744	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Zimmer	Linda	Self	Form - Keep MoPac Local	H - 785	A1, B1, C4, D5, G1, I1
Zimmerman	Mark	Self	Webmail	H - 120	C6
Zuniga	Ricardo	Self	Email - Keep MoPac Local	H - 745	A1, A2, A3, A7, B1, C1, C4, D5, G1, H2, I3
Zuniga	Diana	Self	Webmail	H - 120	C5

Table 2: SH 45SW Comments and Responses

Comment Category	Summarized Comment	Response
A	**Purpose and Need for Project**	
A1	Comment discusses the traffic volume impact of SH 45SW (increase or decrease) on other local roadways, such as MoPac, Slaughter Lane, Brodie Lane, Manchaca Road, FM 1626 or RM 1826	Traffic modeling suggests that building SH 45SW would ease traffic congestion on other local roadways. The Capital Area Metropolitan Planning Organization 2035 travel demand model (see Section 3.2.2 in the Final EIS) indicates portions of FM 1626 from Brodie Lane to Manchaca Road and RM 1826 south of SH 45 would experience a decrease in traffic in 2035 with construction of the proposed project. Traffic modeling further indicates that traffic would increase along FM 1626 from RM 967 to just north of the county line, on RM 1826 north of SH 45, and on MoPac from SH 45 to Lady Bird Lake. Additional traffic on MoPac, however, diminishes substantially north of Slaughter Lane, and can be accommodated by improvements within the Capital Area Metropolitan Planning Organization's 2035 Regional Transportation Plan. The potential impacts of these increases and decreases in traffic are discussed in Final EIS Section 3.2.3 in the Neighborhood/Travel Patterns and Access subsection.
A2	Comment questions how SH 45SW will connect with other roadways, such as MoPac, FM 1626, Bliss Spillar Road, or Archeleta Boulevard	The proposed project would have three points of access: MoPac, Bliss Spillar Road, and FM 1626. No frontage roads are proposed along SH 45SW under the project. The design of the proposed roadway shown in the Final EIS has been altered from what was shown in the Draft EIS to improve safety and operations at Archeleta Boulevard and MoPac (see the schematic in Final EIS Appendix C).
A3	Comment references project limits, such as where the roadway will begin or end, the extent of the study area, or whether SH 45SW will connect with I-35 now or in future	The SH 45SW project (with its limits from MoPac at SH 45 to FM 1626) has logical termini and independent utility as its construction would result in a usable transportation improvement and a reasonable expenditure of public funds even if no additional improvements are made in the area. The project would stand alone, be independently functional, and serve a substantial public purpose by itself. In addition, it would not predetermine locations and types of future transportation projects or force future sections of projects or alignments. The proposed project's study area encompasses approximately 5,327 acres, extending from 0.8 mile west and 0.6 mile north of the SH 45/MoPac interchange southeast to FM 1626. The study area is approximately two miles wide by 4.3 miles long, (see Figure 1.1-1 in the Final EIS). The study area, which was presented during the EIS scoping process, is of sufficient size to allow for a comprehensive evaluation of potential project-related effects on a broad range of resources while being constrained enough to ensure focused and relevant project-related analysis. The proposed project would not connect to I-35. Although the CAMPO 2035 Plan identifies SH 45SW

		from FM 1626 to I-35 for environmental and preliminary engineering analysis, no funds have been identified for such studies, much less for construction of that roadway. If such a connection is pursued in the future, it would be evaluated through a separate environmental study.
A4	Comment asks whether a shared use path for bicyclists and pedestrians will be provided and what the path access will be	The proposed project would include construction of a separate shared use path paralleling the roadway from MoPac to FM 1626. A parking area and access point would be constructed at the SH 45SW/MoPac interchange. The path would connect to the future Violet Crown Trail being planned by the City of Austin and Hill Country Conservancy. See Final EIS Section 2.3 for a description of the shared use path.
A5	Comment states that SH 45SW either will or will not substantially improve travel times	Traffic modeling for the project, using the Capital Area Metropolitan Planning Organization's 2035 travel demand model, indicates peak travel periods in 2035 are shorter with the proposed roadway than without it. Further, without the proposed roadway, travel times at peak periods between MoPac and FM 1626 along existing, non-tolled routes (Slaughter Lane to either Brodie Lane or Manchaca Road) would almost double over observed 2014 travel times. According to calculations, the proposed project would be expected to improve travel times even on these existing routes: travel times along existing roadways are projected to be 89 to 97 percent longer in the morning and 42 to 90 percent longer in the afternoon without the proposed project than with the proposed project. Travel time differences are shown on Table 3.2-10 in Final EIS Section 3.2.2. Further information is available in the Traffic Forecasting Methodology Memorandum, Appendix N.
A6	Comment suggests the potential positive or negative impact of SH 45SW on local mobility, including access, safety and emergency response	The New Tollway on Existing State-Owned Right-of-Way Alternative was identified as the preferred alternative as it is both reasonable – it does not require residential or commercial displacements or directly affect Water Quality Protection Lands – and meets the purpose and need of the proposed project (Final EIS Section 2.4). Travel time modeling shows the proposed roadway would decrease travel times for users in 2035, as well as decrease travel times on existing local roadways over the No Build scenario (in which the proposed project is not constructed). This decrease in travel time indicates local mobility would be improved as traffic congestion is lessened. The proposed SH 45SW would enable emergency vehicles traveling from the Buda area into Austin to bypass congested local roadways (I-35, Manchaca Road, Brodie Lane, and South First), which emergency responders currently use to access hospitals in Austin, including Brackenridge and Seton Medical Center. Some roads, such as MoPac from SH 45 to Lady Bird Lake and FM 1626 from the county line south to RM 967, would see increased traffic as a result of the proposed project (Final EIS Section 3.2.3). However, improvements to FM 1626 are under construction and will be able to accommodate the increase in traffic resulting from the proposed SH

		45SW project. Additional traffic projected to occur on MoPac diminishes substantially north of Slaughter Lane, and can be accommodated by improvements within the Capital Area Metropolitan Planning Organization's 2035 Regional Transportation Plan. See Final EIS Section 3.2.2 for more information on traffic and travel times.
A7	Comment discusses the need to sequence transportation projects appropriately, such as completing MoPac capacity and/or intersection improvements in tandem with SH 45SW, or improving FM 1626 and RM 1826 to handle increased traffic from SH 45SW	Improvements to MoPac or local intersections are managed as separate projects from the proposed SH 45SW. However, traffic modeling shows that current improvements to FM 1626 will accommodate future traffic from SH 45SW. Traffic modeling also shows the segments of MoPac that would experience the greatest increase have enough capacity to accommodate the traffic that would result from the proposed project as well (Final EIS Section 3.2.2). The proposed project, with its limits from MoPac at SH 45 to FM 1626, would have independent utility as it would stand alone, be independently functional, and serve a substantial public purpose by itself. A traffic control plan would be prepared in conjunction with the final design of the project. The plan would include provisions for the safe and efficient movement of vehicles through the construction site, as well as provisions for reduced speed limits, construction site signage and pavement markings, and would be implemented in a manner to minimize construction-related delays and inconvenience to drivers. Also see response to B6.
B	**Process**	
B1	Comment states the SH 45SW Draft EIS is incomplete due to missing studies or information, or is flawed due to incomplete or incorrect analysis	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to the point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These finding are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the

		Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
B2	Comment states a federal-level EIS should be prepared for SH 45SW, instead of a state-level EIS	Since no federal funds would be used to construct the proposed SH 45SW, the Federal Highway Administration, which oversees federally funded projects, has no jurisdiction over the proposed project. As a state and locally funded project, a state-level EIS is required per Texas Administrative Code 43, Part 1, Chapter 2. The content of a state EIS is essentially the same as a federal-level EIS prepared under the National Environmental Policy Act.
B3	Comment recommends that alternative regulations be followed for SH 45SW, such as those from other states or the federal government	The proposed project would be funded entirely with state and local funds, and therefore the environmental review was carried out following state requirements and state procedures. The instances in this Final EIS which refer to requirements in federal law and guidance concerning the preparation of a federal environmental review document are there to show that TxDOT was guided by those matters. However, the ultimate requirements that apply are in state law.
B4	Comment focuses on issues regarding the public review period, such as the period was not long enough, the meetings were not convenient or not well advertised, or the information provided was not sufficient	The public involvement process for the SH 45SW project is following Texas state law, including the rules outlined in the Texas Administrative Code 43, Part 1, Chapter 2, Subchapter E, as well as TxDOT's rules for public involvement, as outlined in its Public Participation Environmental Handbook (http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/760-01-gui.pdf). These rules include specific requirements for the public review period. The Draft EIS was available for public review at the following locations: TxDOT Environmental Affairs Division, E. Riverside Drive; Austin Public Library, Hampton Branch at Oak Hill; Austin Public Library, Pleasant Hill Branch; and the Buda Public Library. The Draft EIS was also available on the project website, www.sh45sw.com. A copy of the Draft EIS was available from TxDOT by written request. Information provided throughout the public involvement process reflected the status of the study at the time the meetings/hearings were held. A total of 261 members of the public attended the first Open House meeting in October 2013; 146 people attended the second Open House meeting in December 2013; and 490 people attended the Public Hearing in July 2014. Additionally, qualified staff were present at each meeting to answer questions. At the Public Hearing, exhibits were presented showing the proposed schematic and explaining the environmental process. In addition, project staff made presentations to further explain the findings in the Draft EIS and the schematic design of the proposed roadway.

B5	Comment states the SH 45SW review process is thorough and transparent	Comment noted.
B6	Comment states SH 45SW should not be studied on its own, but should be part of a larger regional study including other local roadways (such as MoPac)	The SH 45SW project is included in the Capital Area Metropolitan Planning Organization 2035 Plan as a stand-alone project, which has "independent utility." This means that the project would be usable and a reasonable expenditure of public funds even if no other transportation projects are constructed. Additionally, by connecting FM 1626 in northern Hays County to the existing SH 45/MoPac intersection in southern Travis County, the project has logical termini. Finally, the construction of the proposed SH 45SW project would not restrict consideration of alternatives for other reasonably foreseeable projects, such as the MoPac South project. Since both projects meet the above criteria, the SH 45SW EIS and MoPac South projects are being studied independently. Another reason to study the projects separately is that each project has a distinct purpose and need. Nevertheless, the MoPac South project is being taken into consideration as part of the indirect and cumulative impact analysis the SH 45SW Final EIS. See Final EIS Appendix D for indirect effects analysis and Appendix I for cumulative effects analysis. Also see response to A7.
B7	Comment references other projects in the region which have resulted in significant erosion/water quality degradation, and/or the lack of effectiveness of local, state and federal regulations for controlling pollution	TxDOT has committed to a comprehensive environmental protection program. A full-time environmental compliance manager would oversee construction activities and coordinate responses to any environmental incidents. The environmental compliance manager would be a third party not employed directly by the construction firm, and would not be subject to removal without TxDOT/Mobility Authority concurrence. The manager would have the authority to stop construction activity in response to emerging environmental situations on the proposed project site, and would perform or oversee water quality monitoring and inspection/addition of best management practices. Comparisons of sediment contamination on the SH 45SW project with other projects in the county are not applicable as each project is different and subject to unique plans and environmental conditions. Sediment and erosion control efforts will be tailored to the needs of this project and will be employed during the construction and operations phases.
C	**Alternatives**	
C1	Comment recommends improving other roadways instead of constructing SH 45SW, such as Brodie Lane or Manchaca Road	Due to the lack of efficient, direct routes, drivers currently use local roads like Brodie Lane, Manchaca Road, and Slaughter Lane to reach MoPac and other destinations. To improve system connectivity, local mobility and travel times, as well as provide an efficient alternative route to congested local roadways, six possible alternatives were considered. These alternatives included upgrading one or more existing roadway(s)

		to a four-lane highway with frontage roads to maintain local access. Existing roadways studied under this alternative included Brodie Lane, Slaughter Lane and Manchaca Road. Due to the numerous residential and commercial displacements and the direct impact to City of Austin Water Quality Protection Lands, this alternative was considered unreasonable and was dropped from further consideration. The development of alternatives to meet the project need and the analysis of alternatives are discussed in the EIS (Final EIS Section 2.0). As a result of the consideration of alternatives, a roadway constructed on existing state-owned right-of-way was determined to best meet the purpose and need of the project. It would not require acquisition of additional right-of-way, would not directly affect water quality protection lands and would not require any residential relocations or commercial displacements. The identification of the preferred alternative is discussed in Final EIS Section 5.0. City of Austin staff conducted an independent study of alternatives to SH 45SW, including constructing roundabouts on Brodie Lane. They concluded that "Brodie Lane roundabouts have not been pursued for further development as they are not a viable alternative to SH 45SW." They also evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
C2	Comment states public transit should be prioritized over constructing more roadways, and urges more public transit options	To improve system connectivity, local mobility and travel times, as well as provide an efficient alternative route to congested local roadways, six possible alternatives were considered, including Travel Demand Management (TDM). TDM strategies (including telecommuting; priority parking for van pools or car pools; HOV lanes for buses, car- and van-pools; "flextime" to encourage employees to travel outside the most congested times; improved transit service; and pedestrian and bicyclist facilities) reduce the number of vehicles on roadways, particularly during peak travel periods. Capital Metropolitan Transportation Authority operates local rail and bus service; Lone Star Rail is studying a rail connection between Austin and San Antonio; and Project Connect is studying region-wide transit systems. Capital Metropolitan Transportation Authority plans do not currently include any additional service on Brodie Lane or Manchaca Road. Although TDM strategies could provide improved local mobility, travel times, and system

		connectivity, they would not provide an alternative route to congested local roadways and were therefore eliminated from further study. TDM strategies could however be implemented in conjunction with the build alternative.
C3	Comment refers specifically to aspects of the build alternative design, such as lack of frontage roads, intersection design, number of lanes, or turning radii	During the development of the SH 45SW schematic, numerous geometric alternatives were considered. A roundabout at MoPac and SH 45SW was considered, but it was not studied further after traffic modeling indicated a poor level of service for the volume of traffic anticipated on SH 45SW. Also considered were a SH 45SW overpass or direct connector ramps at FM 1626, but traffic volumes did not warrant a grade separation and the single-point urban intersection's traffic model indicates the at-grade intersection will function well for 2035 traffic volumes. Frontage roads between FM 1626 and Bliss Spillar Road were also considered; but since access to adjacent properties could be provided at FM 1626 and Bliss Spillar Road, frontage roads are not included in the proposed project. The project utilizes the Capital Area Metropolitan Planning Organization travel demand model for 2035 traffic. Two lanes each direction for SH 45SW handles the projected traffic volume of 17,200 vehicles per day each way. A new signalized intersection for MoPac/SH 45 frontage roads at Archeleta Boulevard was considered. However, adding a signal for the heavy traffic on eastbound SH 45 to northbound MoPac for the relatively few vehicles from Archeleta Boulevard was not desired. A non-signalized solution is proposed and several design improvements have been made as a result of comments. The new schematic is located in Appendix C of the Final EIS. Design improvements include shifting the roadway alignment further away from Flint Ridge Cave; relocating the Violet Crown Trail connection to the MoPac area, to eliminate the pedestrian underpass west of Bear Creek and reduce the height of the highway in the vicinity of Flint Ridge Cave. A trail head parking area for the shared use path and future connection to the Violet Crown Trail has been located under the SH 45SW bridge just east of MoPac. Safety improvements include increasing the connecting loop ramp radius for southbound MoPac traffic to connect to eastbound SH 45SW and revising the Archeleta Boulevard intersection to provide an acceleration lane along northbound MoPac. The existing SH 45 and Escarpment intersection will be studied for safety improvements by TxDOT under a different project. Another separate project under study are possible improvements to MoPac at LaCrosse Avenue and Slaughter Lane - http://www.mopacsouth.com/about/mopac-intersections-study.php.

C4	Comment opposes SH 45SW, or states that it is not needed	Population growth in northern Hays and southern Travis counties is contributing to increasing congestion and longer travel times on local roadways. While the U.S. Census provides a record of the historical population growth in the area, population projections developed by the Capital Area Metropolitan Planning Organization show the project area is projected to increase by approximately 40 percent between 2010 and 2035. As the population increases, so does the volume of traffic on local roadways. Traffic models project estimated traffic volumes using the local street network, and roads such as Brodie Lane, Slaughter Lane, and Manchaca Road will increase by 50 percent from 2013 to 2035. The need for proposed action is discussed in Final EIS Section 1.4. To improve system connectivity, local mobility and travel times, as well as provide an efficient alternative route to congested local roadways, six possible alternatives were considered. As a result of the consideration of alternatives, a roadway constructed on existing state-owned right-of-way was determined to best meet the purpose and need of the project. It would not require acquisition of new right-of-way, would not directly affect Water Quality Protection Lands, nor would it require any residential relocations or commercial displacements. The development of alternatives to meet the project need and the analysis of alternatives are discussed in Final EIS Section 2.0. The identification of the preferred alternative is discussed in Final EIS Section 5.0.
C5	Comment suggests SH 45SW has been delayed too long, and should be built	Comment noted.
C6	Comment supports the build alternative	Comment noted.
D	**Water Quality Issues**	
D1	Comment focuses on karst issues, and discusses the sensitivity of the project area to water pollution due to local geology	Early design efforts have focused on the identification of caves and karst features in order to provide avoidance or minimization options. Water quality protection has been incorporated into each aspect of project design (construction as well as operation), including the pavement (permeable friction course), project drainage (water quality ponds and vegetative filter strips), and shared-use path components. The suite of water quality best management practices that are included as part of the proposed project design are intended to decrease pollutant loads associated with roadway runoff, maintain recharge potential, and detain any hazardous material spills associated with the proposed facility. Stormwater runoff from the roadway would be collected and treated in water quality ponds before being released to receiving waters. In most cases, the ponds would be the final treatment in a series of best management practices to allow for regulatory standards of treatment to be exceeded project-wide. The water quality ponds and associated

		conveyances would have the additional purpose of detaining hazardous materials spills which would allow for their safe removal and prevent them from reaching receiving waters. Additional levels of protection such as buffer zones and cave gating would be included for sensitive features down-gradient of the project area as well as each of the sensitive features in the right-of-way.
D2	Comment expresses concern about hazmat issues, and/or questions how hazardous materials will be managed on SH 45SW during and after construction	An extensive Hazardous Materials Management Plan would be developed prior to beginning construction of the project that would include spill prevention and, if necessary, mitigation protocols. Techniques would draw from successful examples of projects in similarly sensitive environments including local projects with a focus on avoiding unnecessary risks associated with hazardous materials during the construction phase. The framework of the plan is provided in the Final EIS and includes minimizing on-site storage, restricting hazardous materials handling to less sensitive areas, and providing for impermeable secondary containment of hazardous materials containers during construction. During the operation phase, spill containment would be the primary focus. The roadway would be designed to capture accidental spills which would be diverted to hazardous materials traps where they could be detained until their safe removal, thus preventing them from reaching recharge features or surface waters. Proposed water quality ponds would function as hazardous materials traps, as discussed in the Draft EIS. Project design would include efforts to contain and direct roadway surface spills away from water bodies and recharge features. This design feature would be implemented over the majority of the project. Furthermore, TxDOT policy provides for the mitigation of accidental spills through, in part, returning the site to background conditions. The Final EIS has been updated to describe TxDOT standard procedures to: notify the District spill coordinator and other agencies; physically remove and dispose of hazardous material contaminated soil; and confirm sampling and site restoration. Further discussion of TxDOT's spill response protocol is provided in the SH 45SW Biological Evaluation (Appendix M).
D3	Comment refers to proposed, additional or insufficient best management practices to address water quality, both during and after construction	During construction, structural and non-structural best management practices would focus first on the prevention of erosion (e.g. phased construction, preservation of existing vegetation, limiting land disturbance) and second on the capture of sediment for the prevention of discharge offsite. Permanent structural best management practices (e.g., water quality ponds) would be constructed as early as practicable and would be available to treat stormwater runoff to remove pollutants during the construction phase. After the construction phase, best management practices would be in place, often used in series (e.g., stormwater runoff passing successively through permeable friction

		course pavement, vegetative filter strips, and ultimately to water quality ponds, to reduce total suspended solid and other pollutant loads. These best management practices would also act to increase recharge potential by decreasing peak storm flow discharges. This system of stormwater treatment would allow pollutant loads to be reduced beyond the requirements of the Edwards Aquifer Rules.
D4	Comment specifically addresses the Water Pollution Abatement Plan prepared for SH 45SW, stating it is incomplete or should be stringently followed	Specific karst protections based on the findings of the recently completed Geologic Assessment and karst survey would be included in the Water Pollution Abatement Plan. The Water Pollution Abatement Plan will be prepared during the final design/plans, specifications and estimates stage of project development. While this document is typically finalized during later phases of project development, preliminary designs for karst protections are summarized in the Final EIS.
D5	Comment discusses the importance of maintaining water quality, specifically regarding the Edwards Aquifer or Barton Springs, and/or raises concerns about the effect of SH 45SW on water quality	The development of SH 45SW has proceeded with the protection of the environmental integrity of sensitive ecosystems as a primary focus, with the recognition that the preservation of water quality and quantity is key to that protection. Design elements that will be incorporated to ensure that the project meets or exceeds the protective standards established by the Edwards Aquifer Rules. The focus on protecting environmental integrity will continue through the remaining project development and operation phases.
D6	Comment regards the relationship between impervious cover and water quality degradation (citing studies performed within the City of Austin), and the impact of additional impervious cover on salamander species	Neither urbanization nor impervious cover is a direct cause of water quality degradation; however, their correlation is recognized. A robust suite of best management practices has been developed to minimize the causal elements associated with impervious cover (e.g. altered hydrology and pollutant loads). Some of the studies cited in comments are recognized in the Final EIS as justification for the extensive effort to effectively reduce pollutant loading associated with the proposed project. The best management practices and their corresponding removal efficiencies of highway-associated pollutants are summarized in Appendix H, Table 5-1-1. Trends in constituents commonly observed in highway runoff including solids, heavy metals, and nutrients are discussed in Appendix H, Section 2.2. TxDOT is committed to meeting all applicable water quality regulations and would exceed these in many instances. Degradation of salamander habitat with respect to water quality can be attributed to increased pollutant loads and decreased groundwater quantity. The proposed water quality protection measures would protect endangered salamander species habitat. Additionally, proposed stormwater treatment elements and their associated delayed release of treated stormwater would act to increase recharge potential, thereby potentially increasing groundwater quantity.

D7	Comment refers to methods of quantifying/measuring water pollutants from SH 45SW construction and operation, either stating the proposed method is insufficient or recommending other methods	The constituent most often regulated in stormwater management is total suspended solids (TSS). This measure is used as a surrogate to monitor other pollutant levels as well, because of the strong correlation between suspended solids and other constituents (suspended solids have been shown to carry significant amounts of other pollutants bound to their surface). The Final EIS contains a commitment to removing 90 percent or more of the increase in total suspended solids due to additional impervious cover (post-construction). Equations used within the Final EIS to estimate the percent removal efficacy of proposed best management practices follow industry standards and Texas Commission on Environmental Quality regulations. TxDOT will work to find low-nutrient erosion control methods that benefit vegetation but do not hurt receiving waters with substantial increases in nitrogen levels.
D8	Comment refers to possible best management practices/design features (such as basins/ponds, permeable friction course pavement, low-impact design, etc.), either stating the proposed practices are insufficient or recommending other practices	Ponds proposed within the Final EIS are designed to capture precipitation from up to a 4-inch rainfall event. Other possible low-impact design features such as bio-retention and bio-filtration typically require a great deal of excavation to create storage volume. Any excavation in the project area would be somewhat risky due to the high karst potential; therefore these best management practices are not currently recommended. They may be found feasible, however, during final design at certain areas along the right-of-way with deeper soils. Permeable friction course pavement will be maintained by the Mobility Authority using standard techniques.
D9	Comment discusses potential negative impacts of SH 45SW on Edwards Aquifer/Barton Springs recharge flows	The Final EIS discloses the connection between recharge in the project vicinity and outfall at Barton Springs. The proposed project would meet or exceed all regulatory requirements. As detailed in the Biological Evaluation, the amount of recharge (17.9 acre-feet) contributed by Flint Ridge Cave during a wet year as measured by Hauwert et al. (2005) represents approximately 0.05 percent of the long-term mean annual discharge at Barton Springs; thus indicating that the contribution of recharge from the Flint Ridge Cave drainage area to the Barton Springs Segment is likely important to the flow rate at Barton Springs only during periods of drought.
D10	Comment refers to potential negative impacts of SH 45SW on Flint Ridge Cave	Modifications to the proposed alignment that have occurred since the publication of the Draft EIS have minimized or avoided impacts to Flint Ridge Cave and its surface recharge basin by shifting the roadway farther from the cave opening. In previous project plans, a berm with a bentonite clay liner was proposed for the surface area of the Flint Ridge Cave. This has been removed from the new design as reflected in the Final EIS. The Final EIS alignment was moved further away from the entrance to Flint Ridge Cave, which allowed for the minimization of impacts to the surface recharge basin (proposed impacts were reduced

		from 5.6 to 0.7 acres) and for the preservation of a 345-foot cricket foraging area around the cave's opening. To mitigate for potential recharge water quantity losses associated with the 0.7 acres of proposed impacts, an equivalent area adjacent to the surface drainage basin would be re-graded to direct its surface flow toward the cave opening. Water quality will be protected by proposed measures which would prevent untreated roadway runoff from flowing into the cave's surface drainage area. As detailed in the report titled Potential Effects of the Construction and Operation of SH 45SW on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas (included in the Biological Evaluation), the proposed project would not directly impact Flint Ridge Cave.
E	**Threatened and Endangered Species**	
E1	Comment relates to threatened and/or endangered species within the SH 45SW study area	According to U.S. Fish and Wildlife Service, 18 federally endangered and two federally threatened species are known to occur or may potentially occur in Travis and Hays counties. According to Texas Parks and Wildlife Department, 12 state endangered and 13 state threatened species could occur in Travis and Hays Counties. The potential for habitat for each of these species to occur in the project area was evaluated in the Final EIS. For the majority of the listed species, the state-owned right-of-way does not provide potential habitat and therefore no impacts to these species are anticipated. The potential to impact Golden-cheeked Warblers, Black-capped Vireos, listed karst invertebrates, Barton Springs and Austin blind salamanders, and the Texas horned lizard were presented in the Draft EIS based on previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed SH 45SW Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed SH 45SW Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations (see the Biological Evaluation for more information which is attached to the Final EIS as Appendix M). Based on these studies, no adverse impacts to these species are expected as a result of construction and use of SH 45SW.
E2	Comment focuses on wildlife within the study area, such as concerns about animal crossings or encroachment on habitat	TxDOT and the Mobility Authority are considering fencing to keep wildlife from entering the roadway, provided adjacent landowners agree and that it is compatible with adjacent land use. Wildlife within the project area could cross under the roadway at the Bear Creek Bridge. Encroachment on wildlife habitat is limited because the proposed project would have no

		frontage roads and is adjacent to undeveloped city of Austin water quality protection lands in some areas.
E3	Comment states the Texas Natural Diversity Database alone is insufficient to make conclusions regarding wildlife and it is inappropriate to assume Bear Creek does not contain potential habitat for aquatic species	Texas Natural Diversity Database data were used in conjunction with review of aerial photography and the U.S. Fish and Wildlife Service Critical Habitat Portal to determine potential baseline conditions. In addition, a windshield survey of the study area and field surveys for habitat of terrestrial and avian species within the state-owned right-of-way were completed to determine the potential for species of concern and/or endangered/threatened species within the study area. Bear Creek was determined to be an ephemeral stream within the limits of the state-owned right-of-way that would not be impacted by the proposed project. The supportive details of this conclusion are incorporated into the Final EIS and summarized in the SH 45SW Biological Evaluation.
E4	Comment says the fact that SWCA Environmental Consultants did not find Golden-cheeked Warblers in spring 2014 is not sufficient evidence to conclude the birds are absent and to conclude there will be no impact on the species	Woodlands sharing some of the basic characteristics of Golden-cheeked Warbler habitat are present within the state-owned right-of-way (ROW) and Golden-cheeked Warblers are known to occur irregularly on City of Austin (COA) Water Quality Protection Lands (WQPLs) that border the ROW right-of-way (ROW) (see **Section 3.8.3** of the Final EIS). However, surveys conducted on behalf of the City of Austin indicate that absence of Golden-cheeked Warblers from woodlands in immediate proximity to the state-owned ROW is the usual condition **(**see Appendix M). A Golden-cheeked Warbler survey was conducted in the state-owned ROW in the spring of 2014 in accordance with US Fish and Wildlife Service presence/absence survey protocols. No warblers were detected within or adjacent to the ROW in 2014. A survey of adjacent woodlands on COAWQPLs also failed to detect any Golden-cheeked Warblers in the area in the spring of 2014. No Golden-cheeked Warblers have been detected in the state-owned ROW incidental to surveys conducted on adjacent COA lands. As a result, while some woodland in the ROW shares some characteristics with Golden-cheeked Warbler habitat, none of the woodland is known to be used regularly by the species (see Section 3.8.3 and Appendix M in the Final EIS).
E5	Comment suggests SH 45SW will negatively impact salamanders, or states the EIS salamander studies are insufficient	The technical report Potential for Impacts to Endangered Eurycea Salamanders from the Proposed SH 45SW Project, Travis and Hays Counties Texas and the SH 45SW Biological Evaluation address the water quality and quantity effects of the roadway, all design and best management practices (BMPs) employed to protect the water, and any impacts the roadway may have on salamanders. These analyses conclude that, through the use of these BMPs, the proposed project is

		not expected to adversely impact these salamander species. The technical reports are appended to the Final EIS (see Appendix M).
F	**Trees and Vegetation**	
F1	Comment concerns trees, such as questions about tree removal, protection of heritage-sized trees, or types of trees in the study area	A tree survey has been conducted within the right-of-way to document all trees 24" in diameter at chest height and larger. A second tree survey would be completed prior to final design and an effort to minimize loss to significant trees would be made. The roadway was designed to avoid impacts to karst features first and foremost, so design changes are not anticipated. The shared use path would be designed to avoid as many trees as possible. Further information is contained in Final EIS Section 3.8.
F2	Comment relates to plants/vegetation, such as types of vegetation in the study area or plans to preserve vegetation	Impacts to vegetation, including trees, would be avoided as much as possible. The areas outside of the right-of-way and easements would not be impacted. Vegetation would be removed only where necessary to construct and safely operate the new roadway and shared use path. Further information is contained in Final EIS Section 3.8 and the Biological Evaluation prepared for the project (Appendix M).
G	**Environmental Protection**	
G1	General comment regarding environmental protection, stating that SH 45SW will or will not negatively impact the local environment	Based on an analysis of impacts to several environmental and socioeconomic resources, it was determined that the proposed project would not have significant impacts. The resources analyzed in the Final EIS for potential impacts include land use and development, socioeconomics, geology, soils, air quality, noise, groundwater, surface water, vegetation, threatened and endangered species and habitat, archeological resources, historic resources, hazardous materials, and visual and aesthetic resources (Final EIS Section 3).
G2	Comment relates to the Balcones Canyonlands Conservation Plan; some comments suggest SH 45SW would negatively affect the Balcones Canyonlands Conservation Plan (jeopardizes or violates the plan), while others suggest the project is in compliance with the plan	Participation in the Balcones Canyonlands Conservation Plan is under the purview of the permit holders. It is TxDOT's understanding that Travis County is currently coordinating with the U.S. Fish and Wildlife Service to determine if the ecological integrity of Flint Ridge Cave would be maintained. Please refer to the Final Draft: Potential Effects of the Construction and Operation of SH 45SW on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas technical report in Appendix M.
G3	Comment suggests SH 45SW jeopardizes or is not in compliance with the Consent Decree	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement

		and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. TxDOT has been in communication with the Barton Springs Edwards Aquifer Conservation District at various stages of development of the EIS, and the Barton Springs Edwards Aquifer Conservation District participated in the SH 45SW technical workgroup. TxDOT intends to continue to work with the Barton Springs Edwards Aquifer Conservation District after the EIS is complete, to ensure that SH 45SW is fully protective of water quality in the Edwards Aquifer and Barton Springs.
G4	Comment relates to air pollution, stating that SH 45SW will improve air quality by removing idling cars from other corridors such as Brodie Lane, or that SH 45SW will cause more air pollution by adding cars within the study area	A qualitative air quality analysis was completed for the proposed project (Final EIS Section 3.4). No significant impacts to air quality were identified as a result of the proposed project.
G5	Comment refers to methods of quantifying/measuring erosion from SH 45SW construction and operation	The SH 45SW project includes extensive sediment and erosion control procedures. The revised universal soil loss equation will be used during final design to estimate soil loss, which will guide the team in choosing the best management practices that have been approved by TxDOT to prevent the computed soil loss. The facility would be built on mostly fill material, with extensive slope protection from methods such as straw, coconut/coir blankets, mulching, hydro-mulching, bonded fiber matrix, flexible growth medium, turf mats, etc. The effort to protect exposed soil will be carefully calculated throughout the process.
G6	Comment suggests the EIS lacks information on pest management procedures, and the effects of pesticide or herbicide application on threatened or endangered species	TxDOT uses an integrated pest management approach to ensure healthy vegetative cover. TxDOT's pest management program addresses pest management issues. TxDOT conducted an environmental review of its pest management program (see Final Supplemental EIS for Roadside Pest Management Program). Vegetation management practices are operated according to TxDOT's Roadside Vegetation Management Manual. Separate manuals or guidelines are followed for herbicide operations, invasive species, and landscape inspection. TxDOT operates under a Memorandum of Understanding with the Texas Department of Agriculture to promote public safety, environmental protection, and the effective use of pesticides. Pesticides are defined by TxDOT as any chemical or biological agent that kills plant or animal pests, herbicides, insecticides, fungicides, rodenticides, etc. In general, pesticides are only used adjacent to the roadside. Pesticides would not be used within natural buffers protecting sensitive karst features within the state-owned right-of-way.
H	**Socioeconomic Issues**	

H1	Comment focuses on noise, visual, or light pollution, such as suggesting that SH 45SW will cause negative impacts in these areas, and/or how impacts will be mitigated	**Noise:** Following TxDOT guidelines, a noise analysis was done for the proposed project (Final EIS Section 3.5). As required by TxDOT regulation, noise impacts were modeled for receivers along the proposed roadway. Sound reduction barriers or "noise walls" were modeled for impacted receivers along the proposed project corridor. These noise barriers do not meet TxDOT's feasible (effective) and reasonable (cost-effective) requirements for noise mitigation and therefore are not proposed for the project. See Final EIS Section 3.5.2 for further description of these requirements. Permeable friction course pavement can be used to make a facility quieter. Under current TxDOT guidelines, permeable friction course pavement is not an approved noise abatement measure. **Visual:** Visual impacts associated with the proposed project were analyzed in Section 3.12 of the Final EIS. The visual impacts analysis has been updated in the Final EIS to include information on the elevation of the roadway. According to the visual impacts analysis conducted according to TxDOT guidelines, no significant impacts to visual resources would occur as a result of the proposed project. **Light**: Illumination of SH 45SW would be limited to safety lighting. This includes lighting at locations of roadway intersections, including SH 45SW and FM 1626, Bliss Spillar Road and the SH 45SW ramps, the Bliss Spillar Road ramps connecting to SH 45SW, and SH 45SW at MoPac. Due to the undeveloped setting of the project, illumination would not utilize high mast lighting, but conventional height illumination standards, approximately 40 feet in height, with flat cutoff lenses, or light-emitting diode fixtures, to minimize the glare emitted by the fixture. It is anticipated that underpass lighting would be required for the SH 45SW bridges over Bliss Spillar Road and MoPac. This information has been added to the Visual and Aesthetic Qualities discussion in Final EIS Section 3.12.
H2	Comment suggests SH 45SW will negatively or positively impact overall quality of life	The proposed project would provide an alternative route to congested local roadways, improve travel times, and improve system connectivity and local mobility. The roadway would be located on land already designated for transportation use; therefore, existing neighborhoods would not be bisected and existing access to destinations would not change. Traffic modeling indicates portions of FM 1626 from Brodie Lane to Manchaca Road would experience a decrease in traffic in 2035. Traffic modeling indicates traffic would increase along FM 1626 from RM 967 to just north of the county line, and on MoPac south of Slaughter Lane. However, projects to increase the capacity of FM 1626 are currently undergoing construction or are being planned. Further, traffic modeling indicates that MoPac south of Slaughter Lane has enough capacity to accommodate the increase in traffic.

H3	Comment expresses concern that SH 45SW will cause open space to be lost	The proposed project would be constructed within existing transportation right-of-way and would not encroach onto adjacent water quality protection lands. Impacts to public parks and water quality protection lands located within the study area are discussed in Final EIS Section 3.1. No significant impacts to these lands were identified in the Final EIS.
H4	Comment expresses concerns about impacts to Wildflower Center	The Wildflower Center is located approximately one mile away from the northern terminus of the state-owned right-of-way purchased for SH 45SW, therefore, impacts to visual resources, noise, and air quality from the proposed project were not determined to be significant. The Center is not located within the direct impacts study area of the proposed project. TxDOT regulations specify that only first row noise receivers will be modeled for noise impacts; therefore, noise impacts to the Wildflower Center are not modeled. Traffic modeling cited in the Final EIS indicates that MoPac south of Slaughter Lane has enough capacity to accommodate the increase in traffic associated with the proposed project.
I	**Financial Issues**	
I1	Comment relates to toll issues, such as opposition to tolling or questions about why SH 45SW is proposed as toll facility	Funding for new highways is extremely limited due to fully-committed bond funds, the decreased purchasing power of highway funds, rising fuel efficiency, an aging highway system, and the uncertainty of federal funding. Legislatures and local planners have identified tolling as an option to address the mobility needs of a growing population. The Capital Area Metropolitan Planning Organization is responsible for transportation planning in the six-county Austin metro region, which includes Hays and Travis counties. The organization's most recent long range plan update, the 2035 Regional Transportation Plan (2010), identifies SH 45SW as a four-lane tolled freeway from MoPac to FM 1626. If a build alternative is ultimately recommended at the end of the environmental study, the road would be tolled. The toll road would be built, operated and maintained by the Central Texas Regional Mobility Authority. The existing roadway system in the area is comprised of non-tolled roadways providing alternative travel options for those who choose not to use the proposed toll facility. Toll policies, anticipated toll rates, alternative travel options that are non-toll and potential economic impact to individuals are discussed in Final EIS Section 3.2.2.
I2	Comment regards the overall cost of SH 45SW, which parties are providing the funding, or how the funding will be managed	The proposed project's total cost is anticipated to be approximately $100 million. Funding is anticipated to be provided from several sources, including $15 million from Travis County, $5 million from Hays County,

		as well as funds from Capital Area Metropolitan Planning Organization and loans to the Central Texas Mobility Authority.
I3	Comment generally relates to transportation funding and how funding is distributed	Texas transportation revenues are generated by motor fuel taxes, vehicle registration fees, federal funds, bonds, and Public-Private Partnerships. Until 2002, TxDOT's projects were funded largely with state and federal revenues. Since 2002, revenues have been supplemented by allocations from private partners and borrowed funds generated by bond issues. Currently the primary source of transportation funding is the federal and state motor fuel tax. The state tax on gasoline of 20 cents per gallon has not changed since 1991, while the federal gas tax of 18.4 cents has not changed since 1993. Both the state and federal gas taxes are flat taxes and do not vary according to the price of gasoline; many people are purchasing fewer gallons of fuel because of increasingly fuel-efficient vehicles; and the purchasing power of the motor fuel tax is declining due to inflation.
J	**Indirect and Cumulative Impacts**	
J1	Comment suggests building SH 45SW will result in secondary development and urban sprawl by opening up new right-of-way to development	The purpose of SH 45SW is to improve system connectivity, local mobility and travel times, as well as provide an efficient alternative route to congested local roadways. Land use planning is outside of TxDOT's jurisdiction and is beyond the scope of this project. While induced growth could occur as an indirect result of the proposed project, the likelihood of significant development is constrained by several factors. Approximately 7,742 acres (19 percent) of the proposed project's area of influence is comprised of water quality protection lands; much of this land parallels the state-owned right-of-way on which the proposed roadway would be constructed. These water quality protection lands have been protected in perpetuity from development. Further, the roadway is proposed to be a limited access facility, with only three points of access along it: the two termini at MoPac and FM 1626 and one interchange at Bliss Spillar Road. No frontage roads would be constructed as part of this proposed project, which would greatly limit development alongside the facility. Citing these factors, local planning experts, including the City of Austin, Travis County, and the Barton Springs/Edwards Aquifer Conservation District, indicated in a questionnaire on SH 45SW-related induced growth that they expect the proposed project would have a limited influence on the amount and pace of development in the southern Travis/northern Hays County area. Information regarding the project's Area of Influence and potential impacts are contained in Final EIS Appendix D.
J2	Comment suggests growth and development in the Austin area should be managed more closely to prevent sprawl and traffic congestion	The purpose of SH 45SW is to improve system connectivity, local mobility and travel times, as well as provide an efficient alternative route to congested local roadways. Land use planning is outside of TxDOT's

		jurisdiction and is beyond the scope of this project. The SH 45SW project takes place within the larger context of regional land use and infrastructure planning and development, and measures in place in the various jurisdictions that intersect the project area would apply to development projects proposed by others. Such regulations along with others as described in the mitigation sections of the Indirect and Cumulative Impacts Technical Reports help control growth and development within the project area. SH 45SW would be a controlled-access facility, and the build alternative does not include frontage roads. These factors would greatly limit potential development alongside the facility.
J3	Comment suggests SH 45SW will allow criminals better access to nearby neighborhoods	While construction of SH 45SW would decrease travel time and provide more convenient access to the project area and surrounding neighborhoods, these areas are already accessible using the existing street network. No current data links SH 45SW with increased crime.
J4	Comment regards potential economic impacts of SH 45SW, including effects on property values, existing or new businesses, or tax revenue in Hays or Travis counties	The proposed project would provide an alternative route to congested local roadways, improve travel times, and improve system connectivity and local mobility. SH 45SW would be a controlled-access facility, and the build alternative does not include frontage roads. These factors would greatly limit potential development along the facility. The Shady Hollow Village shopping center, at Brodie Lane and Slaughter Lane, is not located within the direct impact study area for the proposed project. Traffic along Brodie and Slaughter Lanes is projected to continue to increase into 2035 as the Austin area continues to grow. No economic impacts to the businesses in this shopping center would be anticipated as a result of the proposed project.
K	**Construction and Maintenance**	
K1	Comment questions how construction will be monitored to ensure all planned best management practices are followed, and construction adheres to plans	Training would be provided to all personnel involved with the construction of SH 45SW and all construction activities would be actively monitored to ensure all planned best management practices are followed. Protocols would be in place to ensure construction adheres to plans and commitments outlined in the Final EIS. Details on construction management and best management practices are discussed in the Final EIS (Section 6.1) and in Appendix H, and the Water Quality and Aquatic Resource Protection Technical Report (Section 4.1).
K2	Comment regards construction timeline, such as anticipated road completion dates	If SH 45SW is approved, detailed plans and construction would be undertaken by the Mobility Authority. Dates for design plan development, construction, and opening the facility to traffic are subject to change. Design plans are currently anticipated to be completed in 2015, with construction beginning in late 2015 or early 2016, and the facility is anticipated to be open-to-traffic in 2017.

K3	Comment references the costs associated with ongoing maintenance and/or the parties responsible for maintenance	SH 45SW would be maintained by the Mobility Authority. Costs typical for this type facility are approximately $2,500 per year per lane mile for routine maintenance, plus about $3,000 per year per lane mile for pavement rehabilitation (2014 costs). Maintenance costs would be expected to be around $100,000 after opening and increase thereafter according to inflation.
K4	Comment regards lack of specific plans for construction and best management practices to control erosion and water quality	Exact specifications are not typically provided at a schematic-level design phase, and would be prepared during the final design (plans, specifications and estimates) phase. Any phasing plan and associated time limits would almost certainly change in the final stages as the design is refined. Likewise, the exact type and location of best management practices are not prescribed until later stages, to allow for designers and contractors to make informed decisions based upon specific conditions at the time.
L	**General and Miscellaneous**	
L1	Comments about SH 45SW were also received that do not relate to any of the above categories. Examples include: • If road is not built, Austin becomes a city of non-doers • It's a campaign promise to big donors • We can't turn the clock back - Austin will never be a 'medium-sized' city again	Comment noted.
L2	Comments that are not related to SH 45SW were also received. Examples include: • The solution that is being built in Oak Hill will be too complicated for drivers to comprehend. • Big trucks need to be banned on MoPac • US 281 needs overpasses	Comment noted.

SH 45 SW
ENVIRONMENTAL STUDY

Attachment A

Advertisement of Public Hearing

Legal Advertisements

Newspaper	Publish Date
Austin American-Statesman	June 29, 2014

Color Display Advertisements

Newspaper	Publish Date
Oak Hill Gazette	July 10, 2014
Hays Free Press	July 16, 2014
Austin American-Statesman	July 20, 2014
Community Impact (San Marcos/Buda/Kyle)	July 17, 2014
Community Impact (Southwest Austin)	July 24, 2014

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NOTICE OF PUBLIC HEARING FOR STATE HIGHWAY 45 SOUTHWEST (SH 45SW) IN TRAVIS AND HAYS COUNTIES, TEXAS

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties. The hearing will be held in the Bowie High School cafeteria. Bowie High School is located at 4103 W. Slaughter Ln., Austin, TX 78749. The public hearing will begin with an open house from 5-6 p.m. During the open house, project information will be available for review and project team members will be available to answer questions. Technical presentations will begin at 6 p.m. and will be followed by a public comment period.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The preferred alternative would consist of four 12-foot travel lanes (two in each direction), 10-foot outside shoulders, four-foot inside shoulders, and a 10-foot wide bicycle and pedestrian shared use path. It would be located within pre-existing state-owned right-of-way that varies in width between 300 and 600 feet. No additional right-of-way would be required to accommodate the proposed facility/ preferred alternative and no residential or business displacements would result from implementation. The project area is partially located in the Edwards Aquifer recharge zone. SH 45SW is identified in the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan.

The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties. Six preliminary alternatives were evaluated in the Draft Environmental Impact Statement (DEIS). Subsequently, the DEIS evaluated the social, economic and environmental impacts of one build alternative (the preferred alternative described above) and the no-build alternative.

The DEIS, maps and other information concerning the proposed project are available for public inspection at the TxDOT Austin District Office, located at 7901 N. I-35, Austin, TX 78753. In addition, the DEIS is on file and available for public inspection at the following locations:

(1) TxDOT Environmental Affairs Division, 118 E. Riverside Drive, Austin, TX 78704;
(2) Austin Public Library, Hampton Branch at Oak Hill, 5125 Convict Hill Rd., Austin, TX 78749;
(3) Austin Public Library, Pleasant Hill Branch, 211 E. William Cannon Dr., Austin, TX 78745;
(4) Buda Public Library, 303 Main St., Buda, TX 78610.

The DEIS is also available on the SH 45SW project website: www.sh45sw.com. A paper copy and other information about the project may be obtained at the requestor's expense by writing to: Texas Department of Transportation Austin District, Attention: Stacey Benningfield, P.O. Box 15426, Austin, TX 78761-5426, or by email at stacey.benningfield@txdot.gov.

The public hearing will be conducted in English. Persons interested in attending the public hearing who require auxiliary aids or services, such as interpreters, are requested to contact Stacey Benningfield at 512-832-7369 at least five business days prior to the public hearing so appropriate arrangements may be made. TxDOT will make every reasonable effort to accommodate communication or accessibility needs.

All interested citizens are encouraged to attend the public hearing and provide input on the project. Verbal and written comments may be presented at the public hearing. Written comments not submitted at the public hearing may also be submitted to: TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Box 15426, Austin, Texas 78761-5426. Comments will also be accepted at the project website: www.sh45sw.com. All comments received by Wednesday, Aug. 13, 2014, will be included in the official public hearing record.

Carolyn Kline ..

SWORN AND SUBSCRIBED TO BEFORE ME, on 06/30/2014

Eloise Livingston ..

Notary Public in and for
TRAVIS COUNTY, TEXAS

ELOISE LIVINGSTON
Notary Public, State of Texas
My Commission Expires
JULY 31, 2016

STATE OF TEXAS
COUNTY OF TRAVIS

Before me, the undersigned authority, a Notary Public in and for the County of Travis, State of Texas, on this day personally appeared Carolyn Kline. Advertising Agent of the Austin American-Statesman, a daily newspaper published in said County and State that is generally circulated in Bastrop, Bell, Blanco, Brazos, Burleson, Burnet, Caldwell, Colorado, Comal, Coryell, Fayette, Gillespie, Gonzales, Guadalupe, Hays, Kerr, Lampasas, Lee, Llano, Milam, Nueces, San Saba, Travis, Washington and Williamson Counties, who being duly sworn by me, states that the attached advertisement was published at the lowest published rate for Classified advertising in said newspaper on the following date(s), to wit:NANCY LEDBETTER & ASSOCIATES,267982_0629 - IH 45SW TRAVIS & HAYS,First date of Publication 06/29/2014,Last date of Publication 06/29/2014,Web and print times Published 2, Legal Notices, 1 X 120, and that the attached is a true copy of said advertisement.

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Legal Notices

Austin Portable Storage,LLC d/b/a PODS, hereby publishes notice as required by Texas "Storage Facility Liens" section 59.042 and 59.043 of public sale of property Listed below to satisfy a landlords lien, all sales are for cash to the highest bidder and are considered final. PODS reserves the right to reject any bids. The sale shall be held @ 2251 Picadilly Drive Suite# C-580 Round Rock TX. 78664 on Thursday July 10th 2014 @ 5:00 PM.

Cage, Judy	1818135
Cabbo Restoration Company	
Att: Mike Volz	56864
Fowler, Adriana	2948135
Vaughn, Ray	8015835

Contents included but not limited to Household items, books, exercise equipment, stereo equipment and more.

CITY OF SUNSET VALLEY
REQUEST FOR QUALIFICATIONS

THE CITY OF SUNSET VALLEY HAS ISSUED A REQUEST FOR QUALIFICATIONS FOR ARCHITECTURAL AND SPACE PLANNING SERVICES FOR THE CITY FACILITIES PROJECT-POLICE AND PUBLIC WORKS FACILITIES AT THE 3205 JONES ROAD LOCATION. THE RFQ MAY BE OBTAINED ONLINE AT WWW.SUNSETVALLEY.ORG, OR IS AVAILABLE FOR PICK UP M-F, 8-5, AT 3205 JONES ROAD, SUNSET VALLEY, TEXAS, 78745. TIME SCHEDULE FOR SOLICITATION IS LISTED IN RFQ.

INVITATION FOR BIDS

The Housing Authority of the City of Smithville, Texas (hereinafter called the "Local Housing Authority") will receive sealed bids for the modernization of Five (5) dwelling units, including detachment, site work, roofing alterations, plumbing, electrical, mechanical and all work specified and/or shown on the drawings until:

Thursday, July 31, 2014 at 2:00 PM
THE HOUSING AUTHORITY OF
THE CITY OF SMITHVILLE
140 Ken Blanchard Drive
SMITHVILLE, TEXAS 78957

Immediately thereafter all bids will be publicly opened and read aloud.

Proposed forms of contract documents, including plans and specifications, are on file and available for inspection at the office of the Housing Authority of the City of Smithville and at the office of Cameron Allread, Architect Inc., 209 W. 8th St., Fort Worth, Texas 76102, (817) 332-6231 and may be at plan rooms in various cities of the state.

Copies of the documents may be obtained by depositing $100.00 with the Architect for one set of documents per General Contractor. Such deposits will be refunded on return of the plans, specifications and other documents in good condition within 30 days after bid opening. Plans and specifications that have been taken apart are not considered in good condition.

A Pre-Bid Conference will be held Thursday, July 17, 2014 at 2:00 PM at the Smithville Housing Authority.

HOUSING AUTHORITY OF THE
CITY OF SMITHVILLE, TEXAS
Rhonda Baxter, Executive Director
Phone No. 512-360-3286

EQUAL HOUSING OPPORTUNITY

NOTICE OF PUBLIC POSTING FOR WILLIAMSON COUNTY/GLO CDBG GRANT POSTING OF FY2014-2018 CONSOLIDATED PLAN AND 2014 ANNUAL ACTION PLAN AND NOTICE OF PUBLIC HEARING

Williamson County has been awarded a Community Development Block Grant (CDBG) funding allocation of $1,254,965 to successfully support community development and affordable housing efforts for low and moderate-income areas throughout the County. On June 24, 2014 Williamson County Commissioner's Court approved the proposed projects to be included in the 2014 Annual Action Plan. In accordance with HUD regulations, the County encourages public participation to review and comment on the proposed projects and to review and comment on the FY2014-2018 Consolidated Plan which describes goals, objectives and the types of County activities to be potentially funded over the next five years. Individual comments and responses will be included in the planning document. Direct written comments by August 4, 2014 to the following address:
Honorable Dan Gattis, County Judge
710 Main Street
Georgetown, TX 78626
The proposed plans are available for review from July 4, 2014 - August 4, 2014 at the following locations: Williamson County Courthouse and Website at www.wilco.org
City Halls of the following:
City of Cedar Park
City of Georgetown
City of Granger
City of Jarrell
City of Leander
City of Liberty Hill
City of Taylor
City of Thrall
City of Weir

A public hearing will be held by the Williamson County CDBG office on Tuesday, July 15, 2014 at 5:30pm at the Williamson County Courthouse located at 710 Main Street, Georgetown, TX 78626. Please use the 8th Street entrance. The purpose of the hearing is to obtain comments regarding the Consolidated Plan and Annual Action Plan.

Williamson County is committed to compliance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, as amended. Reasonable modifications and equal access to communications will be provided upon request. Please call 512-943-2757 (Voice) or Relay Texas at 1-800-735-2989 (TDD) for assistance.

Dan Gattis, County Judge

AVISO PUBLICO DE LA FIJACION DE WILLIAMSON COUNTY / HUD CDBG GRANT DESPLAZAMIENTO DE FY2014 -2018 PLAN CONSOLIDADO Y 2014 PLAN DE ACCION ANUAL Y AVISO DE AUDIENCIA PUBLICA

El Condado de Williamson se ha adjudicado en Community Development Block Grant (CDBG) (Beca de Bloque del Desarrollo de las Comunidad) la asignacion de fondos de 1254,965 dolares para apoyar con exito el desarrollo de la comunidad y los esfuerzos de vivienda asequible para las zonas de bajos y moderados ingresos en todo el Condado. El 24 de Julio de 2014 la Corte Williamson del Comisionado del Condado aprobo los proyectos propuestos para ser incluidos en el Plan de Accion Anual 2014. De conformidad con las regulaciones de HUD, el condado fomenta la participacion del publico a revisar y comentar sobre los proyectos propuestos y para revisar y comentar sobre el Plan Consolidado FY2014 -2018 que describe las metas, los objetivos y los tipos de actividades del Condado para ser potencialmente financiado durante los proximos cinco anos . Comentarios y respuestas individuales se incluiran en el documento de planificacion. Los comentarios deben ser recibidas antes del 4 de agosto de 2014 a la siguiente direccion:
Honorable Dan Gattis, Juez del Condado
710 Main Street, Ste 101
Georgetown, TX 78626

Los planes propuestos estan disponibles para revision desde 4 de Julio 2014 hasta 4 de agosto 2014 en los siguientes lugares:
Copia del Condado de Williamson y SitioWeb en www.wilco.org
Ayuntamientos de las siguientes:
Ciudad de Cedar Park
Ciudad de Georgetown
Ciudad de Granger
Ciudad de Jarrell
Ciudad de Leander
Ciudad de Liberty Hill
Ciudad de Taylor
Ciudad de Thrall
Ciudad de Weir

Una audiencia publica se llevara a cabo por la oficina de CDBG del Condado de Williamson el Martes, 15 de Julio 2014 a las 5:30 pm en el Palacio de Justicia del Condado de Williamson ubicado en 710 Main Street, Georgetown, TX 78626 . Por favor, use la entrada de 8th Street(Calle Ocho). El proposito de la audiencia es para obtener comentarios sobre el Plan Consolidado y el Plan de Accion Anual .

El Condado de Williamson se compromete al cumplimiento de la Ley de Americanos con Discapacidades (ADA) y la Section 504 del Acta de Rehabilitacion de 1973, segun enmendada. Modificaciones razonables e igual acceso a comunicaciones se puede proporcionar a peticion. Por favor llame a 512-943-2757 (voz) o Relay Texas al 1-800-735-2989 (TDD) para obtener ayuda.

Dan Gattis, Juez del Condado

NOTICE TO CONTRACTORS
TERRA COLINAS PHASE ONE
STREET, DRAINAGE, WATER, and WASTEWATER IMPROVEMENTS

Sealed proposals, in duplicate, addressed to TERRA COLINAS, LLC. ON BEHALF OF TRAVIS COUNTY MUNICIPAL UTILITY DISTRICT NO. 18 (Travis County MUD No. 18), for the construction of "TERRA COLINAS PHASE ONE - STREET, DRAINAGE, WATER, and WASTEWATER IMPROVEMENTS" in Travis County, TX, will be received at the office of Longaro & Clarke, LP, 3839 Bee Cave Road, Suite 150, Austin, Texas 78746 UNTIL 2:00 PM ON THE DATE OF JULY 15, 2014, at which time the proposals will be publicly opened and read aloud. No faxed bids will be accepted. Any proposals received after the closing time will be returned unopened. The bid is for all the improvements for the project, which includes erosion controls and all labor, equipment, and other necessary appurtenances to construct the project. Bids must be submitted on the form included in the bid documents, in a sealed envelope marked "Bid for Terra Colinas Phase One - Street, Drainage, Water, and Wastewater Improvements."

Prospective bidders are required to submit Statements of Qualification with their bids. Qualification forms are included in the bid documents. Failure to submit the required Statement of Qualification as required will be sufficient cause to reject a contractor's bid.

Plans, specifications and contract documents may be obtained from the office of Longaro & Clarke, LP, 3839 Bee Cave Road, Suite 150, Austin, Texas 78746. Plans and Specifications will be available after June 25, 2014. A non-refundable deposit of one hundred ($100.00) dollars is required for each set of documents purchased. Plans and specifications may be downloaded from the office of the engineer without charge. Plans and specifications may be examined without charge at the office of the engineer. Bidders should carefully examine the plans, specifications, and other documents, visit the site of the proposed work, and fully inform themselves as to all conditions and matters which can in any way affect the work or the cost thereof. Bonds: A bidder who discrepancies in, or omissions from the plans, specifications, or other documents, or should be in doubt as to their meaning, the Engineer shall be notified, and clarification obtained prior to submitting any bid.

A Cashier's Check or Certified Check upon a national or state bank payable to Terra Colinas, LLC, in an amount not less than two percent (2%) of the total bid (Bidder's Check), must accompany the bid proposals as a guarantee that, if awarded the contract, the bidder will within ten (10) days of the award of the contract, enter into a contract and furnish an acceptable performance and payment bond in the amount of one hundred percent (100%) of the contract price. The Bidder's Check will be forfeited and become the property of the Owner should the bidder fail to enter into a contract and furnish bonds acceptable to the Owner within ten (10) days after award of the contract. The notice of award of contract shall be given by the Owner within sixty (60) days after the bid opening. The Bidder's Check must be enclosed in the same envelope as the bid. Bids without a Bidder's Check will not be considered. All bid securities will be returned to the respective bidders within seventy-two (72) hours after bids are opened, except the three most qualified Bidders, which the Owner elects to hold until the successful Bidder has executed the contract. Thereafter, all remaining securities, including security of the successful bidder after entering into a contract, will be returned within forty five (45) days of the notice of award. The successful bidder must furnish performance bond and payment bond in the amount of one hundred (100%) percent of the contract price from an approved surety company holding a permit from the State of Texas to act a surety (and acceptable according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States) and having Best Key Rating Guide of A or better.

No proposals shall be withdrawn for a period of sixty (60) days after the opening of the bids.

The Owner reserves the right to reject any and/or all bids and to waive all formalities in the bidding process. The Owner also reserves the right to determine which bid is most advantageous, and to award the contract on this basis.

A maintenance bond to Travis County MUD No. 18 will be required in the amount of twenty percent (20%) of the contract for all stormwater, utility and roadway improvements and is to remain in force for a period of one (1) year from the date of final acceptance from Travis County MUD No. 18.

Contractors must be plan holder-reviewers of record and must attend the MANDATORY pre-bid meeting to be eligible to submit a bid. A MANDATORY pre-bid conference will be held at 2:00 PM ON THE DATE OF JULY 1, 2014 at the office of Longaro & Clarke, LP.

Minimum Wage Scale: As specified and regulated by the State of Texas and the Federal Government.

Legal Notices

NOTICE TO BIDDERS

Sealed bid proposals addressed to Carma Easton LLC, on behalf of Pilot Knob Municipal Utility District No. 3 (the "District"), c/o Jacobs Engineering Group Inc., Attn: Justin Buck P.E., will be received from qualified bidders until 3:00 p.m. CST on July 9, 2014 for furnishing all labor, supplies and supervision necessary for construction of the Easton Park Section 1A Utility Improvements (the "Project"). The Project includes approximately 2,209 LF of 16-inch water pipeline installation, 3,800 LF of 10-inch wastewater force main installation, 2,000 LF of 12-inch gravity wastewater pipeline installation, 9 wastewater manholes, and associated appurtenances.

BIDS will be opened and publicly read aloud at 3:00 p.m. CST at the offices of Jacobs Engineering Group Inc., 2705 Bee Cave Road, Suite 309, Austin, Texas 78746, on the same date. No taxed bids will be accepted. Any proposal received after the closing time will be filed unopened. Bids must be submitted on the form included in the bid documents, in sealed envelopes marked "Bid for Easton Park Section 1A Utility Improvements Project."

PLANS AND SPECIFICATIONS for the Project may be examined without charge at the offices of Jacobs Engineering Group Inc. (telephone: (512) 314-3100). Proposal forms, specifications, plans and contract documents may be obtained without charge from www.PlanetDrive.USA.com. Bidders must register on this website in order to view and/or download proposal forms, specifications, plans and contract documents.

A MANDATORY PRE-BID CONFERENCE will be conducted on July 1, 2014 at 10:00 a.m. CST at 2705 Bee Cave Road, Suite 309, Austin, Texas 78746.

A bid must include BID SECURITY in the form of a certified or cashier's check or a bid bond issued by a surety legally authorized to do business in Texas, payable to the DISTRICT, in an amount of at least 10% of the total amount of the bid, in accordance with Section 49.271(c), Texas Water Code, as a guaranty that, if awarded the contract, the bidder will promptly enter into a contract with Carma Easton LLC on behalf of the District and furnish bonds on the terms provided.

IF A BID IS ACCEPTED, the contractor will be required to furnish, at the contractor's expense, (i) payment and performance bonds in accordance with Section 2253, Texas Government Code; (ii) a one-year maintenance bond in the amount of 10% of the contract price, in a form and executed by and with a surety satisfactory to the District, upon final payment under the contract; (iii) workers' compensation insurance coverage in accordance with Section 406.096, Texas Labor Code; and (iv) general liability insurance insuring against liability for bodily injury, personal injury, death, or property damage.

NO BID may be withdrawn for at least 90 days after the scheduled closing time for receipt of bids.

THE AWARD will be made on the basis of the lowest responsive bid received. The right is reserved to waive any informality in the bidding and to reject any or all bids. The Project is being constructed by Carma Easton LLC on behalf of and in the name of the District. The contract will provide that the contractor will look solely to Carma Easton LLC for payment of all sums coming due thereunder.

Minimum Wage Scale: The contract will require compliance with Chapter 2258, Subchapter B, Texas Government Code, pertaining to prevailing wage rates. In accordance with Section 49.279, Texas Water Code, the District specifies the prevailing wage rates for public works established by Travis County, Texas as the District's prevailing wage rates. The contractor for the Project shall pay not less than the specified prevailing wage rates to workers employed by it in execution of the contract.

Travis County Integral Care (ATCIC) is currently seeking applications through an open enrollment for a Request for Application (RFA) for YES waiver services. Applications must be received by Integral Care no later than 5 p.m. on July 3, 2014. Please download the RFA link to access the RFA, and follow the submission instructions. - http://www.integralcare.org/content/requests-applications-and-proposals If you have any questions regarding the RFA, please send an email to Providers@atcic.org.

NOTICE OF PUBLIC HEARING
FOR STATE HIGHWAY 45 SOUTHWEST
(SH 45SW) IN TRAVIS AND HAYS COUNTIES, TEXAS

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties. The hearing will be held in the Bowie High School cafeteria. Bowie High School is located at 4103 W. Slaughter Ln., Austin, TX 78749. The public hearing will begin with an open house from 5-6 p.m. During the open house, project information will be available for review and project team members will be present to answer questions. Technical presentations will begin at 6 p.m. and will be followed by a public comment period.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626, a distance of approximately four miles. The preferred alternative would consist of four 12-foot travel lanes (two in each direction); 10-foot outside shoulders; four-foot inside shoulders; and a 10-foot wide hike and bike trail for shared use path. It would be located within pre-existing state-owned right-of-way that varies in width between 280 and 600 feet. No additional right-of-way would be required to accommodate the proposed facility's preferred alternative and no residential or business displacements would result from implementation. The project area is partially located in the Edwards Aquifer recharge zone. SH 45SW is identified in the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan.

The purpose of the proposed project is to improve system connectivity, local mobility and travel options, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties. Six preliminary alternatives were evaluated in the Draft Environmental Impact Statement (DEIS). Subsequently, the DEIS evaluated the social, economic and environmental impacts of one build alternative (the preferred alternative described above) and the no-build alternative.

The DEIS, maps and other information concerning the proposed project are available for public inspection at the TxDOT Austin District Office, located at 7901 N. I-35, Austin, TX 78753. In addition, the DEIS is on file and available for public inspection at the following locations:

(1) TxDOT Environmental Affairs Division, 118 E. Riverside Drive, Austin, TX 78704;
(2) Austin Public Library, Hampton Branch at Oak Hill, 5125 Convict Hill Rd., Austin, TX 78749;
(3) Austin Public Library, Pleasant Hill Branch, 211 E. William Cannon Dr., Austin, TX 78745;
(4) Buda Public Library, 303 Main St., Buda, TX 78610.

The DEIS is also available on the SH 45SW project website: www.sh45sw.com. A paper copy and other information about the project may be obtained at the requestor's expense by writing to: Texas Department of Transportation - Austin District, Attention Stacey Benningfield, P.O. Box 15426, Austin, TX 78761-5426, or by email at stacey.benningfield@txdot.gov.

The public hearing will be conducted in English. Persons interested in attending the public hearing who require auxiliary aids or services, such as interpreters, are requested to contact Stacey Benningfield at 512-832-7263 at least five business days prior to the public hearing so appropriate arrangements may be made. TxDOT will make every reasonable effort to accommodate communication or accessibility needs.

All interested citizens are encouraged to attend the public hearing and provide input on the project. Verbal and written comments may be presented at the public hearing. Written comments not submitted at the public hearing may also be submitted to: TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Box 15426, Austin, Texas 78761-5426. Comments will also be accepted at the project website: www.sh45sw.com. All comments received by Wednesday, Aug. 13, 2014, will be included in the official public hearing record.

Legal Notices

Request for Proposal

Education Service Center Region 12 seeks sealed proposals from Internet telecommunication providers for services to a consortium of school districts in central Texas.

Sealed proposals are due no later than 2:00 pm CDST, Friday August 1, 2014 and should be sent to Education Service Center-Region 12, 5701 Springdale Road, Austin, Texas, 78723 and to the attention of Ralph Smith-Proposal for Telecommunication Services.

A copy of the RFP is posted at www.esc12.net/rfp or contact Steve Stroud at steve.stroud@esc12.net, or call (512) 919-5476 if you have questions concerning the content of the proposal.

THE AUSTIN AMERICAN-STATESMAN WILL BE CLOSED IN OBSERVANCE OF INDEPENDENCE DAY ON FRIDAY, JULY 4TH, 2014.
Early Deadlines are in effect.

LINE ADS
Pub: Friday, July 4th
Deadline: Tuesday, July 1st at 4pm
Pub: Saturday, July 5th
Deadline: Wednesday, July 2nd at 4pm
Pub: Sunday, July 6th
Deadline: Wednesday, July 2nd at 4pm
Pub: Monday, July 7th
Deadline: Wednesday, July 2nd at 4pm

DISPLAY ADS
Pub: Friday, July 4th
Deadline: Tuesday, July 1st at noon
Pub: Saturday, July 5th
Deadline: Monday, June 30th at noon
Pub: Sunday, July 6th
Deadline: Tuesday, July 1st at noon
Pub: Monday, July 7th
Deadline: Wednesday, July 2nd at noon
Pub: Tuesday, July 8th
Deadline: Thursday, July 3rd at noon
Pub: Wednesday, July 9th
Deadline: Thursday, July 3rd at noon

To place a legal notice, please email your notice to legals@statesman.com

Public Notice of Closure

The M.M. AccuMed Ventures, L.L.C. d/b/a Amedisys Home Health agency located at 2800 South IH 35, Suite 21, Austin, TX 78704-5700, and its branch location, M.M. AccuMed Ventures, L.L.C. d/b/a Amedisys Home Health located at 898 IH 35 N, Suite 130, Round Rock, TX 78664-4310 announces their closure and will no longer participate in the Medicare program (Title XVIII of the Social Security Act) effective December 6, 2013.

The agreement between Amedisys and the Secretary of Health and Human Services has terminated on December 6, 2013 in accordance with the provisions of the Social Security Act.

No payment for patients whose plan of care that began on or after the date of closure will be made by the Medicare program. For patients whose plans of care began prior to the closure effective date, payment to the agency can be made for services furnished up to 30 days following the effective date of closure.

We would like to thank our staff, physicians and community for their trust and support. For more information visit http://www.amedisys.com/news-media/press-contacts

PUBLISHER'S AFFIDAVIT

I solemnly swear that the above public notice was published in the "Oak Hill Gazette" newspaper on July 10, 2014.

Penelope Levers, Publisher

STATE OF TEXAS
COUNTY OF TRAVIS

This document was acknowledged before me on 9/5/14 (date) by Penelope Levers

(signature of notarial officer)

Annie Aguirre
(printed name)

ANNIE AGUIRRE
Notary Public, State of Texas
My Commission Expires
AUGUST 06, 2015

My commission expires: 8-6-15

Notary Public, State of Texas

Rattlesnakes and rat snakes invade local neighborhoods

BY TONY TUCCI

OAK HILL - Two kinds of snakes, similar in size and actions, are on the crawl in southwest Travis County, and have some residents confused about which is friend and which is foe.

The diamondback rattlesnake is a menace whose bite can cause illness or even death. The rat snake, similar in color, size and certain mannerisms, will bite when cornered, but its bite is not poisonous.

Residents have noticed an increase in snake encounters, finding them on their yards, in their gardens, under their hedges and even in their garages. The reason for the increased activity this time of year is twofold, said Andy Gluesenkamp, herpetologist with the Texas Parks and Wildlife Department. Snakes are more active in the spring and early summer when they are seeking mates and new sources of food and water. And humans are more active as they weed their gardens and pick up debris.

Gluesenkamp said the two snakes actually are not that similar, but can be mistaken for each other at first glance. This is particularly true since the rat snake often mimics the behavior of a rattlesnake, such as vibrating its tail against dry leaves to sound like the rattler's warning.

The late John Henry Faulk, legendary Austin entertainer, used to tell the story about going to the hen house to gather eggs, but when he reached into the nest above his head, there was a big rat snake. John Henry said he jumped back, hit the ground, got up and ran crying to his mother.

"Why John Henry, that was just a rat snake. He wouldn't hurt you."

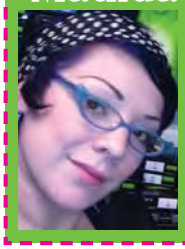
"No," John Henry said, rubbing his backside, "but it could scare you so bad you'd hurt yourself."

Gluesenkamp cautioned against killing the snakes, since they help control the rodent population and otherwise contribute to the balance of Nature. He said residents should use a broom to guide the snake into

Continued on page 11

Top: rattlesnake, above, a rat snake.

Matilda at My Salon Suites



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SH 45SW PUBLIC HEARING

SH 45 SW ENVIRONMENTAL STUDY

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties.

SH 45SW Public Hearing
TUESDAY, JULY 29, 2014
5 – 6 p.m. – Open House
6 p.m. – Formal Presentation, followed by public comments
Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

The Draft Environmental Impact Statement is available at the SH 45SW project website: **www.sh45sw.com**. If you are unable to attend the hearing, but want to comment on the project, please visit our Virtual Open House on the project website July 30 - Aug. 13, 2014.

If you have special communication or accommodation needs, please contact Stacey Benningfield at 512-832-7369 by July 22, 2014.

Texas Department of Transportation

CENTRAL TEXAS Regional Mobility Authority

Grab a Gazette at your local HEB or Randall's

Hays Free Press

113 West Center Street § 122 N. Main St.
Kyle, Texas 78640 § P.O. Box 339 • Buda, Texas 78610

(512) 262-NEWS (Kyle office) • (512) 295-9760 (Buda office) • (512) 268-0262 (fax)

State of Texas §
County of Hays §

Affidavit of Publication

My name is Cyndy Slovak-Barton, and I am Publisher of the Hays Free Press. I am over the age of 18, have personal knowledge of the facts stated herein, and am otherwise competent to make this affidavit.

The Hays Free Press is a legal newspaper publication under Texas law, headquartered and regularly published in Hays County, Texas. It is a newspaper of general circulation, and is generally circulated in Hays, Travis, and Caldwell Counties.

The attachment hereto was published in the Hays Free Press on the following dates at or below the classified legals rate:

July 16, 2014,

Cyndy Slovak-Barton, Publisher
Hays Free Press

Subscribed and sworn before me this the 17 day of July, 2014.

Notary Public
Connie Brewer

CONNIE E BREWER
NOTARY PUBLIC
State of Texas
Comm. Exp. 10/22/2016

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Castro is new HUD chief

On a vote of 71-26, the U.S. Senate confirmed San Antonio Mayor Julián

new alternative fuel and hybrid vehicles powered by electricity, compressed natural gas, liquefied natural gas, hydrogen, propane or a mixture of fuels containing at least 85 percent methanol by volume.

Grant recipients must

employment and housing discrimination laws.

Ed Sterling works for the Texas Press Association and follows the Legislature for the organization.

edsterling@texaspress.com

SH 45SW PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

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SH 45SW Public Hearing
TUESDAY, JULY 29, 2014
5 – 6 p.m. – Open House
6 p.m. – Formal Presentation, followed by public comments
Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

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If you have special communication or accommodation needs, please contact Stacey Benningfield at 512-832-7369 by July 22, 2014.

Austin American-Statesman
statesman.com

AFFIDAVIT OF PUBLICATION

THE STATE OF TEXAS

COUNTY OF TRAVIS

Before me, the undersigned authority, a Notary Public in and for the County of Travis, State of Texas, on this day personally appeared:

Wendy Udave, Sales Coordinator

of the Austin American-Statesman newspaper published in said County and State, who, being duly sworn by me, states that the Nancy Ledbetter & Associates incurred charges for print ad in said newspaper (The Austin American-Statesman) on or about the following dates:

#276496 07/20/14

Representative's Signature

SWORN AND SUBSCRIBED TO BEFORE ME, THIS 9th day of September, 2014

ELOISE LIVINGSTON
Notary Public, State of Texas
My Commission Expires
July 21, 2015

Eloise Livingston
Notary Public in and for
TRAVIS COUNTY, TEXAS

305 S Congress Avenue, Austin, TX 78704 512/445-3742

UT MEXICAN MAPS EXHIBIT

Mexican maps put on display

By Anjanette Gautier
iAhora Sfl

A new cartography exhibit provides a historical glimpse of the way Mexicans chose to depict their surroundings on maps, and thus how they viewed the world.

The exhibit by the Benson Latin American Collection at the University of Texas is called "Mapping Mexican History: Territories in Dispute, Identities in Question" and will be on display on the second floor of the Faulk Central Library, 800 Guadalupe St., until Oct. 15.

The exhibit includes full-sized reproductions of the original maps that are part of the Benson collection.

Some are "hand-painted pieces by indigenous tribes done a little after the Spanish arrival to Mexican lands, and they constitute a fabulous window into the visual traditions of ancient Mexico," said José Montelongo, a Mexican materials bibliographer at the Benson.

Montelongo will give a presentation in Spanish about the library exhibit at 2 p.m. Sunday.

The maps range from the 16th to the 19th century, he said, and have images in which "the graphic codes used by the indigenous groups are mixed with the styles and uses of European cartography."

PUT YOURSELF ON THE MAP

In honor of the map exhibit, the Austin Public Library is inviting the community to help make a virtual map of Austin. Participants are asked to tweet a place in Austin that has some significance to them using the hashtag #APLmap. The library will add the places to a Google map during the summer, and people can watch the progress on Twitter by following @AustinPublicLib. For more information, call 512-974-7400.

Search

continued from B1

By all accounts, Suk could look forward to a bright future. A computer science student at the University of California, Berkeley, he was in Texas for the summer after a Dallas technology company recruited him for an internship.

He spent the last day of a weekend getaway in Austin, on a boat in Lake Travis, with his boss and a few other coworkers. At about 6:30 p.m., Suk and another man decided to cool off in the water.

After about 10 minutes, witnesses said Suk appeared to be in distress.

"Other people on boat jumped out and swam to him once they saw he was having trouble, but they were too late," Suk's friend and longtime Berkeley roommate Robert Hernandez said. "It's bizarre. I don't even know how to describe it."

Kha Suk was working for a nonprofit in Cambodia when her mother called to tell her what happened to her brother.

As the only boy in the family, Song Hy Suk occupied an important place in their lives, she said.

Like his mother, he worked all the time without complaint, she said. He wanted to achieve great success to help their mother.

"He used to call my mom every weekend and tell her that he was going to graduate from college and get a good job so he could buy her a house so she wouldn't have to work so hard anymore," Kha Suk said. "He is the star of my heart. I really don't know how I can live without him right now."

The two Florida divers are set to arrive in Austin on Tuesday after Suk's family committed to paying the initial cost of their flight and hotel accommodations.

Though his family is from California, they've all been staying in Austin since his disappearance, waiting for someone to find him.

They're going to stay here as long as they can, Suk's uncle Presi Sandoval said.

"This kid was super smart. He was doing some really wonderful work at UC-Berkeley," Sandoval said. "His main goal was to bring a better lifestyle for mom and the rest of the family."

The family is accepting donations at www.piggybackr.com/khasok71.

Contact Andrew McLemore at 512-445-3638.

Apollo

continued from B1

tive technology at hand. We are now at almost twice the historical remove from the first moon landing as the Apollo 11 team was from the end of World War II. Ruiz remembers having to take a slide rule class at junior college as part of his training.

Sometimes he sounds amazed they – we, America – pulled it off once, let alone six times.

"There were at least 50 things that could happen at any time and these guys would be lost," Ruiz said.

Just consider the lunar module, an enormously fragile and arachnid-looking contraption that carried Armstrong and Buzz Aldrin to the moon's surface. With alarms going off all around him, Armstrong took over manual control of the craft and landed it with just seconds' worth of fuel to spare.

"All you have here is fuel for the landing and fuel for the takeoff," Ruiz said. "They're sitting on bombs."

He says it was intense to be part of a team that was working to make history.

"We had a sense of urgency," he said. "We had to beat the Russians. Sometimes I woke up exhausted, but we got up every day because as Americans we had a challenge. We are a nation that is inquisitive. That's why we're different. All other countries just duplicate us. We head toward a challenge."

There's also a cool coincidence to Ruiz's career. When he joined the Navy in 1958, he was sent to the aircraft carrier USS Hornet, which was dry-docked along the West Coast. More than a decade later, it was the Hornet that was waiting to take the three Apollo 11 astronauts home after they splashed down in the Pacific Ocean.

Is he proud? Wouldn't you be? But now and again, he's reminded to not get too sizable for his astronaut pants. Once he was giving a talk, and the man who was to introduce him asked Ruiz what he was most proud of. Ruiz mentioned Apollo, and that Grumman had reportedly inscribed the names of its moon team, including Ruiz, on the descent stage of the LEM, which was left behind.

The introduction went: "This is the first guy to litter the moon."

Contact Patrick Beach at 512-445-3603.

CORRECTION

The Leander City Council approved a smaller high-density zone within its transit district on Thursday after landowners asked the city to shrink the area, which has more rules for development.

The high-density zone around the city's MetroRail station has minimum height requirements for buildings and is designed to create a pedestrian-friendly area with shops, housing and offices within walking distance.

Leander revises transit district

The Leander City Council revised its transit district Thursday to shrink the area designated for high-density development. Landowners lobbied for the change because they said the restrictions were scaring off developers and businesses.

STEVE LOPEZ/STAFF

Kelso

continued from B1

too expensive out there, and there's no place to park.

So, why is Cigarroa receiving "voluminous nonconstructive emails"? Simple.

He's the man who told UT-Austin President Bill Powers to resign this fall or face getting the boot from the UT System Board of Regents.

Since then, Cigarroa and Powers have come to an agreement, allowing Powers to keep his job until June 2015.

After Cigarroa announced he was sending Powers packing, many Orange Bloods were unhappy, since they believe Cigarroa got rid of Powers because of marching orders from Texas governor and famous Aggie Rick Perry.

Cigarroa has been quoted as saying that nothing could be further from the truth. I'm not so sure about that.

That Perry spends his evenings reading Whitman's "Leaves of Grass" would be further from the truth.

That Perry wants a UT president who is knowledgeable in the field of dance would be further from the truth.

Still, I'm impressed that Cigarroa has come up with a new and colorful expression to define snotty emails that tell the recipient to go pack sand.

University of Texas Chancellor Francisco Cigarroa is getting lots of email.

Although I would argue that these emails are not "nonconstructive."

In fact, they provide a valuable learning opportunity.

They teach you that no matter what decision you make, someone will disagree and perhaps tell you to fry a certain part of your anatomy in deep fat.

Or as my father, Elmer Kelso, once told me, "You couldn't get everybody to agree on free money."

Another thing these emails teach you?

They rarely get the job done, since these messages don't persuade the recipient to take the advice of the person who sent it along.

For example, I have never been tempted to "go take a leap at a flying doughnut." Not that I've got anything against doughnuts.

So don't sweat it, Chancellor Cigarroa. You are not alone in this category.

And don't move to College Station, no matter how many folks are sending you directions ... although you can cut down on your mileage if you go by way of Lexington.

John Kelso's column appears on Sundays. Contact him at jkelso@statesman.com or

SH 45SW
PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties.

SH 45SW Public Hearing
TUESDAY, JULY 29, 2014
5 – 6 p.m. – Open House
6 p.m. – Formal Presentation, followed by public comments
Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

The Draft Environmental Impact Statement is available at the SH 45SW project website: www.sh45sw.com. If you are unable to attend the hearing, but want to comment on the project, please visit our Virtual Open House on the project website July 30 - Aug. 13, 2014.

If you have special communication or accommodation needs, please contact Stacey Benningfield at 512-832-7369 by July 22, 2014.

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My name is Jenna Parsons. I certify that I am an employee of the publishers of Community Impact Newspaper. I certify that the attached ad was published in the Community Impact Newspaper San Marco/Buda/Kyle edition on July 17th 2014 at the cost of $825.00 and the Southwest Austin edition on July 24th 2014 at the cost of $1,085.00.
I certify that the attached tear sheet is a true and accurate copy of the publications as they appeared in the Community Impact Newspaper on the above-specified date.

SUBSCRIBED AND SWORN TO BEFORE ME on this 31st date of July, 2014, to certify which witness my hand and official seal.

7/31/14

Employee, Community Impact Newspaper

Notary, State of Texas
(seal)

Katy Sierk
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State of Texas
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CITY & COUNTY

News from San Marcos and Buda

Compiled by Brett Thorne and JJ Velasquez

Citizens committee recommends up to $55M bond

BUDA A bond package of up to $55 million is being considered by Buda City Council after an advisory committee issued its recommendation July 2.

The Buda Bond Advisory Committee, a group of citizens appointed by the council to explore the possibility of a bond program, concluded its June 27 meeting by questioning whether alternatives to building a stand-alone police station or consolidated city complex—with City Hall, the public library and a police station housed in one building—could be looked into.

The bond could also address areas such as roads, drainage, parks and trails.

The decision on a final bond amount is up to City Council. According to city figures, the tax increase on the average homeowner—the average home in Buda is valued at $158,000—could be about $250 annually if a $50 million bond was called.

If the council decides to order a $60 million bond, it could require about $330 in annual taxes from the average homeowner.

In order to hold a November election, the bond must be called by Aug. 18.

Tax implications

The Buda Bond Advisory Committee passed down a recommendation of up to $55 million in projects for the city. The city's financial adviser presented homeowner cost scenarios for bonds of $40 million, $50 million and $60 million.

Home value of $158,000

MONTHLY COST TO HOMEOWNER

$40M	$50M	$60M
$13.35	$21.03	$28.06

TOTAL BOND AMOUNT

Source: Specialized Public Finance

CTMC reaches new agreement with Blue Cross

SAN MARCOS Central Texas Medical Center, a member of the Adventist Health System, announced June 27 it had reached a new agreement with Blue Cross Blue Shield of Texas that allows Blue Cross members to receive health care at the hospital at in-network prices.

CTMC, the only hospital in San Marcos, was no longer in the Blue Cross network after a contract between the two organizations expired April 7.

The new agreement, which dictates how much CTMC receives from Blue Cross for providing care to Blue Cross customers, took effect July 1 and brings Adventist's three Texas hospitals—including CTMC in San Marcos, Metroplex Adventist Hospital in Killeen and Rollins Brook Community Hospital in Lampasas—back into the Blue Cross network.

In May, CTMC Director of Marketing Clay DeStefano said he thought community involvement would play a key role in resolving the issue. After announcing the new agreement he said he had heard anecdotally from many Hays County residents and business leaders about their efforts in lobbying Blue Cross to bring CTMC back into the insurer's network.

"We think it's unfortunate that the delay [between contracts] happened, but we think this new agreement is better for everyone," DeStefano said.

Terms of the new reimbursement agreement were not disclosed.

"Adventist is a valuable partner, and we're pleased our continued discussions have resulted in an agreement that provides access to care for our members," said Jack Towsley, divisional senior vice president of healthcare delivery for Blue Cross.

Meetings

Buda City Council
Meets at 6:30 p.m. the first and third Tuesday of each month
121 Main St. • 512-312-0084
www.ci.buda.tx.us

Kyle City Council
Meets at 7 p.m. the first and third Tuesday of each month
Live webcasts of meetings:
www.ustream.tv/channel/kyle-city-council
100 W. Center St. • 512-262-1010
www.cityofkyle.com

San Marcos City Council
Meets at 6 p.m. the first and third Tuesday of each month
Live webcasts of meetings:
www.sanmarcostx.gov/videos
630 E. Hopkins St. • 512-393-8000
www.sanmarcostx.gov/

Hays County Commissioners Court
Meets at 9 a.m. each Tuesday
Live webcasts of meetings:
www.co.hays.tx.us/commcourtlive
111 E. San Antonio St., San Marcos
512-393-2205 • www.co.hays.tx.us

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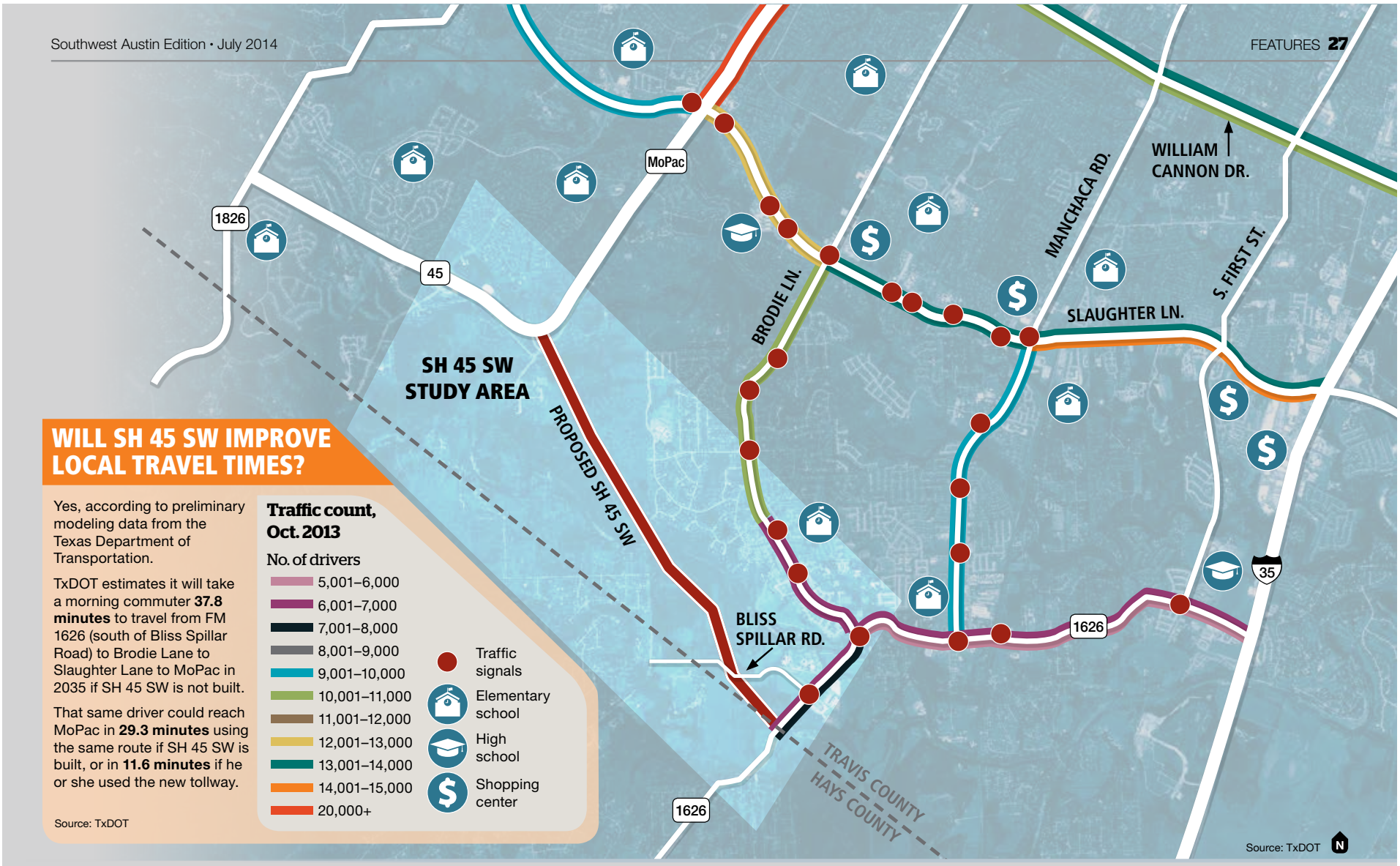

WILL SH 45 SW IMPROVE LOCAL TRAVEL TIMES?

Yes, according to preliminary modeling data from the Texas Department of Transportation.

TxDOT estimates it will take a morning commuter **37.8 minutes** to travel from FM 1626 (south of Bliss Spillar Road) to Brodie Lane to Slaughter Lane to MoPac in 2035 if SH 45 SW is not built.

That same driver could reach MoPac in **29.3 minutes** using the same route if SH 45 SW is built, or in **11.6 minutes** if he or she used the new tollway.

Source: TxDOT

Traffic count, Oct. 2013

No. of drivers

- 5,001–6,000
- 6,001–7,000
- 7,001–8,000
- 8,001–9,000
- 9,001–10,000
- 10,001–11,000
- 11,001–12,000
- 12,001–13,000
- 13,001–14,000
- 14,001–15,000
- 20,000+

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SH 45SW PUBLIC HEARING

SH 45 SW ENVIRONMENTAL STUDY

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties.

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6 p.m. – Formal Presentation, followed by public comments
Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

The Draft Environmental Impact Statement is available at the SH 45SW project website: **www.sh45sw.com**. If you are unable to attend the hearing, but want to comment on the project, please visit our Virtual Open House on the project website July 30 - Aug. 13, 2014.

If you have special communication or accommodation needs, please contact Stacey Benningfield at 512-832-7369 by July 22, 2014.

Texas Department of Transportation

Central Texas Regional Mobility Authority

SH 45 SW
ENVIRONMENTAL STUDY

Attachment B

Additional Public Hearing Notification

[redacted]

From: SH 45SW Environmental Study
Sent: Wednesday, July 2, 2014 5:23 PM
To: [redacted]
Subject: SH 45SW Environmental Study E-Newsletter

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SH 45 SW
ENVIRONMENTAL STUDY

CLICK HERE TO READ THE DRAFT EIS

SH 45SW ENVIRONMENTAL STUDY AVAILABLE FOR PUBLIC REVIEW

The Draft Environmental Impact Statement (EIS) for the SH 45SW environmental study is now available for public review and input. The Texas Department of Transportation and the Central Texas Regional Mobility Authority will host a public hearing regarding proposed construction of SH 45SW on Tuesday, July 29 at Bowie High School (details below).

The proposed project would entail construction of a limited-access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The purpose of the proposed project is to improve system connectivity, local mobility, and travel times, while providing an efficient alternate route to congested local roadways in northern Hays and southern Travis Counties.

WHAT'S NEW?

- ***The State Draft EIS for SH 45SW is available for your review at the locations listed below***
- ***Six preliminary alternatives were evaluated***
- ***The preferred alternative is a four-lane roadway (two lanes in each direction) with shoulders and a shared use path for bicyclists and pedestrians, all located within pre-existing state-owned right-of-way***
- ***A public hearing has been scheduled for July 29th (see details below)***

ABOUT THE DRAFT EIS

Six preliminary alternatives were evaluated. Subsequently, the Draft EIS evaluated the social, economic and environmental impacts of one build alternative and the no-build alternative.

The preferred alternative would consist of:

- four 12-foot travel lanes (two in each direction)
- a 10-foot outside shoulder
- a four-foot inside shoulder
- a 10-foot shared use path for bicyclists and pedestrians

It would be located within existing state-owned right-of-way. No additional right-of-way would be required to accommodate the proposed project and no residential or business displacements would result from implementation.

The project area is partially located in the Edwards Aquifer recharge zone. SH 45SW is identified in the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan.

Although the Draft EIS identifies a preferred alternative, the final selection of the preferred alternative could occur only after a public comment period including a public hearing, consideration of comments, and evaluation of environmental effects.

WHERE CAN I FIND THE DRAFT EIS?

The Draft EIS is available for review at the following locations:

- TxDOT Austin District Office, 7901 N. I-35, Austin, TX 78753

JOIN US FOR A PUBLIC HEARING

We invite you to attend the public hearing and provide your input on the proposed SH 45SW project.

SH 45SW Public Hearing
Tuesday, July 29, 2014

- 5 – 6 p.m. – Open House
- 6 p.m. – Formal Presentation, followed by public comments

Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

Find out more about the public hearing at the project website.

STAY IN TOUCH

Please visit us online at www.sh45sw.com. You may contact the study team using the electronic submission form on the website, or by phone at 512-593-4202.

CONTACT US

P.O. Box 15426
Austin, TX 78761-5426
T: (512) 593-4202

- TxDOT Environmental Affairs Division, 118 E. Riverside Drive, Austin, TX 78704
- Austin Public Library, Hampton Branch at Oak Hill, 5125 Convict Hill Rd., Austin, TX 78749
- Austin Public Library, Pleasant Hill Branch, 211 E. William Cannon Dr., Austin, TX 78745
- Buda Public Library, 303 Main St., Buda, TX 78610

It is also available on the SH 45SW project website: www.sh45sw.com. A paper copy and other information about the project may be obtained at the requestor's expense by writing to: Texas Department of Transportation Austin District, Attention Stacey Benningfield, P.O. Box 15426, Austin, TX 78761-5426, or by email at stacey.benningfield@txdot.gov.

F: (512) 832-7157

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To: [redacted]
Subject: Join us at the SH 45SW Public Hearing!

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SHARE YOUR THOUGHTS ON **SH 45SW** AT THE PUBLIC HEARING JULY 29

Mark your calendar for the upcoming SH 45SW public hearing on Tuesday, July 29, hosted by TxDOT and the Mobility Authority. From 5 – 6 p.m., project information will be available for review in an Open House format, with project team members on hand to answer questions. Technical presentations will begin at 6 p.m., followed by a public comment period, during which attendees will have the opportunity to share their thoughts on the proposed project.

DETAILS:

WHAT: **Public Hearing**

WHEN: **Tuesday, July 29, 2014**

5:00 – 6:00 p.m.: Open House

6:00 p.m.: Technical presentations, followed by a public comment period

WHERE: **Bowie High School (Cafeteria)**

4103 W. Slaughter Ln. Austin, TX 78749

WHY THE DRAFT EIS AND PUBLIC HEARING ARE IMPORTANT

READ THE DRAFT EIS

The Draft EIS is available for review at the following locations:

The Draft Environmental Impact Statement (EIS) and subsequent public hearing are an important part of the environmental process. This process helps to ensure that transportation decision-making takes into account the potential impacts on the human and natural environment, and that the public's participation in the decision-making process is fully documented.

An EIS is the most detailed level of environmental documentation and includes the following elements:

- Discussions of the purpose and need for the project
- Detailed list of project alternatives
- Description of the affected environment
- The environmental consequences of the proposed project

One result of the EIS is the development of a preferred alternative, which is presented to the public, along with the Draft EIS document, at a public hearing to give the community an opportunity to share thoughts on the preferred alternative and its potential environmental impact.

Any comments submitted during the public comment period will be taken into consideration by TxDOT and the Mobility Authority. The final selection of a preferred alternative can occur only after the public hearing process is complete.

- **TxDOT Austin District Office**, 7901 N. I-35, Austin, TX 78753
- **TxDOT Environmental Affairs Division**, 118 E. Riverside Drive, Austin, TX 78704
- **Austin Public Library, Hampton Branch at Oak Hill**, 5125 Convict Hill Rd., Austin, TX 78749
- **Austin Public Library, Pleasant Hill Branch**, 211 E. William Cannon Dr., Austin, TX 78745
- **Buda Public Library**, 303 Main St., Buda, TX 78610

It is also available on the SH 45SW project website: www.SH45SW.com.

CONTACT US

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Subject: Visit the Virtual Open House for SH 45SW!

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THE OPPORTUNITY TO SHARE YOUR COMMENTS WITH US DIDN'T END AT THE SH 45SW PUBLIC HEARING LAST WEEK.

Through Wednesday, August 13th, you can participate in the process by reviewing materials and submitting comments at the SH 45SW Virtual Open House, available online now. Any comments submitted by August 13th will be included in the official project record. All of the materials provided during the Public Hearing are available online, including the fact sheet, presentations, exhibits, the Draft Environmental Impact Statement and draft project schematics.

Over 475 members of the public attended the Public Hearing to share their thoughts and opinions on the project, and we want to hear from you, too. Visit the virtual open house and get your comments included today!

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Subject: Fwd: Austin Mobility News

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> **Date:** July 28, 2014 at 9:30:45 AM CDT
> **To:** [redacted]
> **Subject: Austin Mobility News**
> **Reply-To:** Austin Transportation Department [redacted]

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Public hearing scheduled for SH-45 initiative

The **Texas Department of Transportation**, in cooperation with the **Central Texas Regional Mobility Authority**, will conduct a public hearing to discuss the proposed construction of State Highway 45 Southwest from Loop 1 (MoPac) to FM 1626 on Tuesday, July 29, at Bowie High School Cafeteria, located at **4103 Slaughter Lane, Austin, TX 78749**.

The hearing will begin with an open house at 5 p.m., followed by a formal presentation at 6 p.m. A public comment session will be held after the presentation.

The proposed SH 45SW project would entail construction of a toll road from MoPac to FM 1626 that includes two lanes in each direction, 10-foot shoulders and a 10-foot wide bicycle and pedestrian shared-use path. No additional right-of-way would be required to accommodate the proposed facility and no residential or business displacements would result from implementation.

The environmental document, maps, drawings and other project information will be on

display at the hearing. Written comments may be submitted at the public hearing, mailed to TxDOT Austin District Environmental Coordinator, P.O. Box 15426, Austin, Texas 78761-5426, faxed to (512) 832-7157, or submitted online at **www.SH45SW.com/contact/**. When submitting an official comment via the website, citizens should select "Official Comment" to ensure inclusion of their comment in the public hearing record. Written comments must be received by Wednesday, Aug. 13, 2014 in order to be included in the official public hearing record.

For more information about this project, visit **SH45SW.com**.

Check it out: "Complete Streets: An Interview with Austin's Director of Transportation Rob Spillar"

"Earlier this summer, Austin City Council adopted a Complete Streets policy, which ties into the Imagine Austin Comprehensive Plan. Complete Streets isn't a policy exclusive to Austin; across the country 600 regional and local jurisdictions, 27 states have adopted Complete Streets policies to design streets with all users in mind, not just cars. That includes pedestrians of all ages and abilities, transit riders and vehicles, and cyclists. To learn more about what the Complete Streets policy will mean for Austin's streets, [Movability Austin] sat down with the city's Director of Transportation Rob Spillar."

Click here to read the interview from Movability Austin.

City's Urban Trails Program seeks feedback on Sunset Valley/Oak Hill trail alignment

The **City of Austin Urban Trails Program** is currently analyzing the feasibility of a portion of the **Violet Crown Trail through Sunset Valley/Eastern Oak Hill Area.** Urban Trails would like **your** feedback on the proposed alignment of the trail.

Together with the **Hill Country Conservancy** and the **Oak Hills Trails Association**, the Urban Trails Program staff hopes to receive input from area residents, property owners, cyclists, pedestrians, and other stakeholders to plan, design, and build a trail that will accommodate neighborhoods and commuters for many years to come.

The community is invited to attend an open house on Wednesday, July 30 at the Will Hampton Library (**5125 Convict Hill Road**) from 5:30 p.m. to 8:00 p.m. to discuss the alignment for the proposed trail.

Sometimes called “multi-use” or “shared-use” paths, Urban Trails are used by bicyclists, walkers, joggers for both recreation and transportation purposes.

Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the U.S.

This week we bring you our final installment in a series of articles about the most recent findings from the **National Institute for Transportation and Communities (NITC)** report. The report indicates the presence of protected bike lanes is a strong catalyst for an increase in ridership.

One of the key motivators for the installation of protected bicycle lanes is their perceived increase in safety.

- Nearly every intercepted bicyclist (96 percent) and 79 percent of residents stated the installation of the protected lane increased the safety of bicycling on the street.
- 37 percent of bicyclists felt the safety of driving also increased because of protected bike lanes.

Also noteworthy in the study was insight into the impact of the protected lanes on neighborhood desirability and economic activity.

- Nearly three in four residents felt protected bike lanes had led to an increase in the desirability of living in their neighborhood.

- Approximately 20 percent of residents who bicycled on the street stated that how often they stop at shops and businesses increased after the installation of protected bike lanes.

These motivators support the installation of protected bicycle lanes which in turn, are likely to attract new bicyclists – particularly those who have an interest in bicycling more, but are concerned for their safety. Attracting large shares of these potential bicyclists is essential to realizing many of the potential benefits of bicycling that cities, including Austin, are aiming for.

To read the study, **click here**.

Share Tweet +1 Forward to Friend

Want more mobility news? Visit Movability Austin!

Austin Mobility News Staff:

Cheyenne Krause: Public Information Specialist, ATD - (512) 974-7907

Samantha Alexander: Public Information & Marketing Manager, ATD - (512) 974-7923

Austin Mobility is the City's effort for a fresh approach to looking at walking, biking, transit, and driving to solve the transportation puzzle for all of us. We are taking proactive steps to engage and educate the community, which is why you received this news update.

Our mailing address is:

Austin Transportation Department

505 Barton Springs Rd

Suite 800

Austin, TX 78704

Add us to your address book

Austintexas.gov/department/transportation

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SH 45SW PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

On July 29, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.

The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties.

SH 45SW Public Hearing
TUESDAY, JULY 29, 2014
5 – 6 p.m. – Open House
6 p.m. – Formal Presentation, followed by public comments
Bowie High School Cafeteria
4103 Slaughter Ln., Austin, TX 78749

The Draft Environmental Impact Statement is available at the SH 45SW project website: www.sh45sw.com. If you are unable to attend the hearing, but want to comment on the project, please visit our Virtual Open House on the project website July 30 - Aug. 13, 2014.

If you have special communication or accommodation needs, please contact Stacey Benningfield at 512-832-7369 by Tuesday, July 22, 2014.

Texas Department of Transportation

CENTRAL TEXAS Regional Mobility Authority

SH 45 SW
ENVIRONMENTAL STUDY

PRSRT STD
ECRWSS
U.S. POSTAGE
PAID
EDDM RETAIL

The proposed project would be located within existing state-owned right-of-way. No additional right-of-way would be required to accommodate the proposed project and no residential or business displacements would result from implementation.

Local
Postal Customer

SH 45 Southwest Environmental Study Available for Review

Contact: Kelli Reyna **Phone:** (512) 832-7060 **Date:** July 3, 2014

Alternatives evaluated for improving connectivity, mobility between south MoPac and FM 1626

AUSTIN — In the past 20 years, population growth in northern Hays and southern Travis Counties has increased by more than 200 percent. This rapid growth and resulting traffic issues led the Capital Area Metropolitan Planning Organization to identify the need for SH 45SW in the area's long range transportation plan. Consequently, the Texas Department of Transportation and the Central Texas Regional Mobility Authority are studying possible solutions for addressing the increased traffic congestion and delays on the local roadway network from Loop 1 (MoPac) to FM 1626, a distance of approximately four miles.

The preliminary results of the SH 45SW environmental study are now available for public review in the draft Environmental Impact Statement (EIS). An EIS is a comprehensive document that evaluates and discloses the environmental, social, and economic impacts potentially resulting from the proposed construction and operation of a project.

"The project team recognized the sensitivity of this project from day one and has worked with our partners, including the city of Austin, to protect the water quality of the Edwards Aquifer, Barton Springs, and karst features in the area, including Flint Ridge Cave," said Carlos Swonke, TxDOT director of environmental affairs. "We are confident that we would have a safe and environmentally responsible project."

Several highlights of the SH 45SW draft EIS include:

- Development of best management practices regarding water quality and endangered species
- Traffic analysis and report
- Potential environmental impacts to natural resources, local communities, and cultural resources
- Effects from future development

"TxDOT and the Mobility Authority follow the standards set by the Texas Commission on Environmental Quality for protecting the Edwards Aquifer and by applying the best management practices mentioned in the draft EIS, the proposed roadway would actually exceed those standards," Swonke said.

To review the draft EIS or for more information about the SH 45SW environmental study, visit: www.sh45sw.com.

To get involved, join TxDOT and the Mobility Authority at a public hearing on Tuesday, July 29 at Bowie High School, located at 4103 Slaughter Lane in Austin. The hearing will begin with an open house at 5 p.m. followed by a formal presentation at 6 p.m. A public comment session will be held after the presentation.

For media inquiries, contact Kelli Reyna at kelli.reyna@txdot.gov or (512) 832-7060.

The Texas Department of Transportation is responsible for maintaining 80,000 miles of road and for supporting aviation, rail, and public transportation across the state. TxDOT and its 12,000 employees are committed to working with others to provide safe and reliable transportation solutions for Texas by maintaining a safe system, addressing congestion, connecting Texas communities, and being a Best in Class state agency. Find out more at TxDOT.gov. Fan us on Facebook, and follow us on Twitter.

MEDIA ALERT

For Immediate Release:
July 28, 2014
Contact: Rick L'Amie
Central Texas Regional Mobility Authority
512-996-9778 (office)
512-924-4000 (cell)

Contact: Kelli Reyna
Texas Department of Transportation
512-832-7060 (office)
512-658-1487 (cell)

PUBLIC HEARING TO TAKE PLACE FOR SH 45 SOUTHWEST PROJECT

AUSTIN — The Texas Department of Transportation, in cooperation with the Central Texas Regional Mobility Authority, will conduct a public hearing to discuss the proposed construction of State Highway 45 Southwest from Loop 1 (MoPac) to FM 1626 on Tuesday, July 29, at Bowie High School Cafeteria, located at 4103 Slaughter Lane, Austin, TX 78749.

The hearing will begin with an open house at 5 p.m. followed by a formal presentation at 6 p.m. A public comment session will be held after the presentation.

The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternate route to congested local roadways in northern Hays and southern Travis counties.

The proposed SH 45SW project would entail construction of a limited access toll road from MoPac to FM 1626 that includes four 12-foot travel lanes (two in each direction), 10-foot outside shoulders, four-foot inside shoulders, and a 10-foot wide bicycle and pedestrian shared use path. No additional right-of-way would be required to accommodate the proposed facility and no residential or business displacements would result from implementation.

The environmental document, maps, drawings and other project information will be on display at the hearing. Written comments may be submitted at the public hearing, mailed to TxDOT Austin District Environmental Coordinator, P.O. Box 15426, Austin, Texas 78761-5426, faxed to (512) 832-7157, or submitted online at www.SH45SW.com by clicking on the "Contact Us" tab. When submitting an official comment via the website, citizens should select "Official Comment" to ensure inclusion of their comment in the public hearing record. Written comments must be received by Wednesday, Aug. 13, 2014 in order to be included in the official public hearing record.

###

[redacted]

From: [redacted]
Sent: Monday, October 13, 2014 4:58 PM
To: marie@nancyledbetter.com
Subject: FW: SH 45SW Public Hearing

From: [redacted]
Sent: Friday, July 18, 2014 10:19 AM
To: [redacted]
Subject: FW: SH 45SW Public Hearing

FYI. Elected official invite email went out today.

From: Mario Espinoza [redacted]
[redacted] July 18, 2014 8:18 AM
To: Mario Espinoza [redacted] Terry McCoy [redacted]
[redacted]
Cc: Mike Heiligenstein [redacted], Melissa Hurst [redacted] Laura Bohl [redacted]
Subject: SH 45SW Public Hearing

Good morning,

TxDOT and the Mobility Authority are hosting a public hearing this month regarding the proposed SH 45SW project in Travis and Hays counties.

SH 45SW Public Hearing
Bowie High School (cafeteria)
4103 Slaughter Ln., Austin, TX 78749
Tuesday, July 29, 2014

5:00-6:00 PM: *Open House* - project information will be available for review and project team members will be available to answer questions.
6:00 PM: *Technical Presentations, followed by a public comment period*

The proposed project is a limited-access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. It would be located within existing state-owned right-of-way. No additional right-of-way would be required to accommodate the proposed project, and there would be no residential or business displacements. The purpose of the proposed project is to improve system connectivity, local mobility, and travel times, while providing an efficient alternate route to congested local roadways in northern Hays and southern Travis Counties.

As you may know, population growth in this area increased by approximately 200 percent between 1990 and 2010. As a result of growth and development, and due to the lack of direct and efficient alternative routes, drivers are using local roads, such as Manchaca Road, Slaughter Lane and Brodie Lane, as commuter corridors, and in some cases to access MoPac to get to downtown Austin. These local roads have become increasingly congested and signalized intersections exacerbate the traffic problem. Some neighborhoods have also expressed concerns about cut-through traffic and the inability to safely exit their neighborhoods.

The Draft Environmental Impact Statement (EIS), available on the project website www.sh45sw.com, evaluates the social, economic and environmental impacts of the project mentioned above and the no-build alternative. Although the Draft EIS identifies a preferred alternative, the final selection of the preferred alternative could occur only after a public comment period including a public hearing, consideration of comments, and evaluation of environmental effects. A final decision about whether or not to build the project is anticipated in 2015.

Please let us know if you have any questions or concerns about the project. We would be happy to schedule a meeting with you or your staff. More information about the project can be found online at www.SH45SW.com.

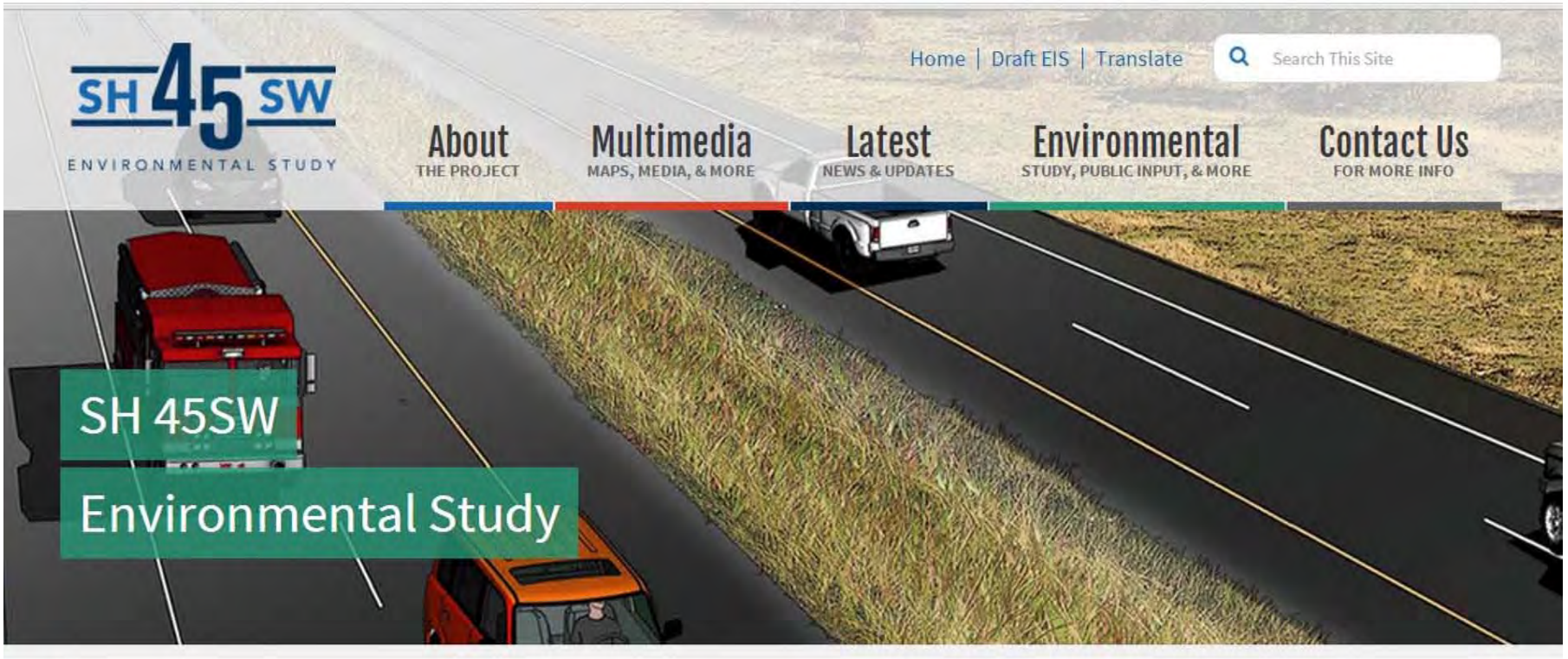
Sincerely,

Mario Espinoza, Deputy Executive Director
Central Texas Regional Mobility Authority
mespinoza@ctrma.org
512-450-6291

Terry McCoy, Deputy District Engineer
Texas Department of Transportation
Austin District
Terry.McCoy@txdot.gov
512-832-7040

Carlos Swonke, Environmental Affairs Division Director
Texas Department of Transportation
Carlos.Swonke@txdot.gov
512-416-2734

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.



WELCOME TO THE

SH 45SW Environmental Study

The Texas Department of Transportation is working with the Central Texas Regional Mobility Authority and regulatory agencies to study a possible solution for improving mobility in the rapidly growing area of northern Hays and southern Travis counties. This combined effort includes an environmental study of an area between MoPac and FM 1626. The study will consider environmental impacts, constraints, the needs of drivers, and concerns of surrounding neighbors.

Latest News

JUL 29 Join us for a Public Hearing at Bowie High School starting at 5 p.m. **Details here.**

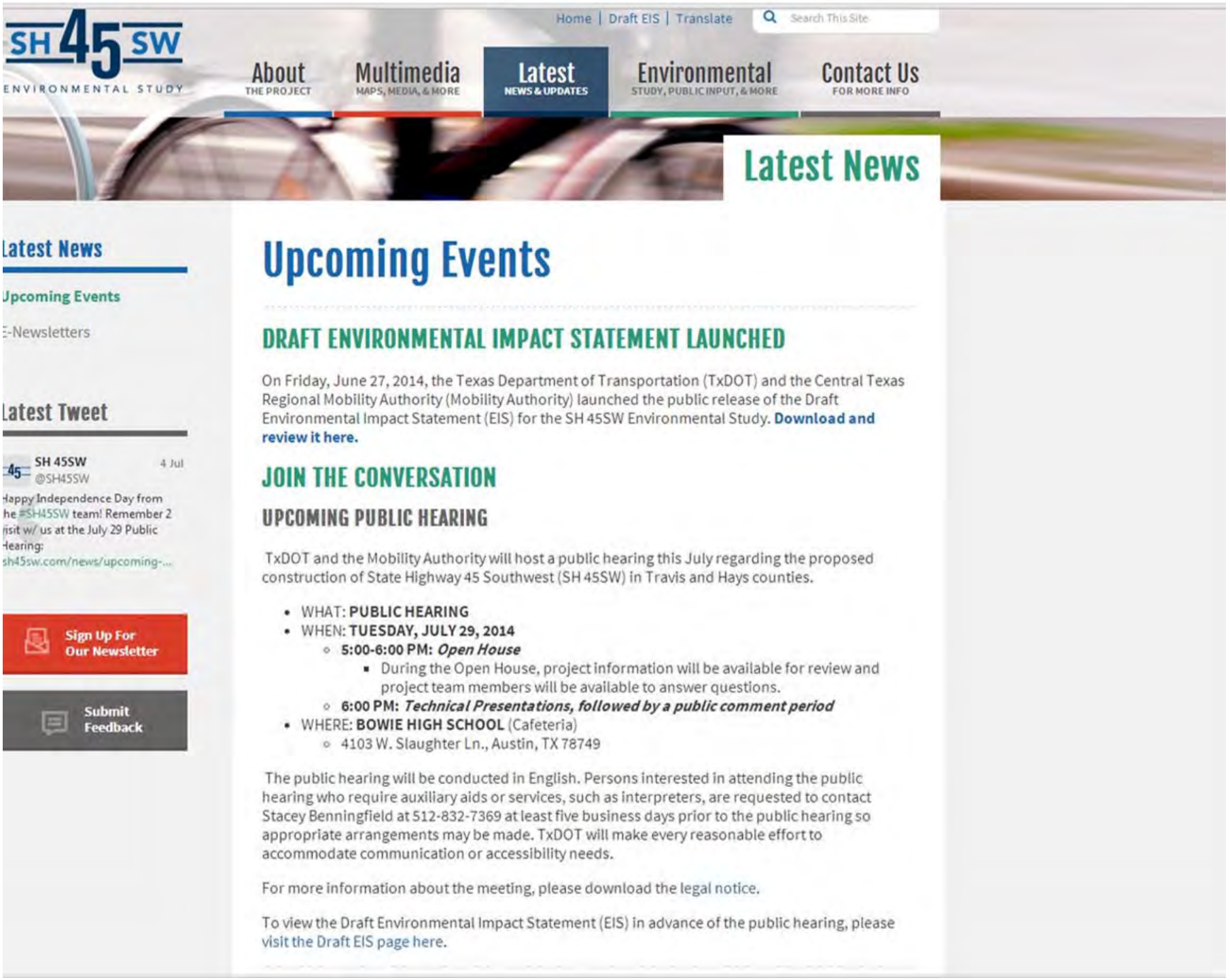
JUN 27 The public release of the Draft Environmental Impact Statement (EIS) has launched. **Check it out here!**

READ ALL NEWS »

Latest Tweet

Tweets by @SH45SW

READ ALL TWEETS »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ENVIRONMENTAL STUDY
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4 Jul
Happy Independence Day from
he #SH45SW team! Remember 2
isit w/ us at the July 29 Public
Hearing:
sh45sw.com/news/upcoming-...
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Feedback
Upcoming Events
DRAFT ENVIRONMENTAL IMPACT STATEMENT LAUNCHED
On Friday, June 27, 2014, the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) launched the public release of the Draft Environmental Impact Statement (EIS) for the SH 45SW Environmental Study. Download and review it here.
JOIN THE CONVERSATION
UPCOMING PUBLIC HEARING
TxDOT and the Mobility Authority will host a public hearing this July regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.
WHAT: PUBLIC HEARING
WHEN: TUESDAY, JULY 29, 2014
5:00-6:00 PM: Open House
During the Open House, project information will be available for review and project team members will be available to answer questions.
6:00 PM: Technical Presentations, followed by a public comment period
WHERE: BOWIE HIGH SCHOOL (Cafeteria)
4103 W. Slaughter Ln., Austin, TX 78749
The public hearing will be conducted in English. Persons interested in attending the public hearing who require auxiliary aids or services, such as interpreters, are requested to contact Stacey Benningfield at 512-832-7369 at least five business days prior to the public hearing so appropriate arrangements may be made. TxDOT will make every reasonable effort to accommodate communication or accessibility needs.
For more information about the meeting, please download the legal notice.
To view the Draft Environmental Impact Statement (EIS) in advance of the public hearing, please visit the Draft EIS page here.

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Public Hearing - SH 45 Southwest

Home > Inside TxDOT > Get Involved > Hearings & Meetings > Schedule

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Contact Us

Where: Bowie High School Cafeteria
4103 Slaughter Lane
Austin, TX 78749

When: Tuesday, July 29, 2014
Open House: 5 p.m.
Presentation: 6 p.m.

Purpose: The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority will host a public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties. The public hearing will begin with an open house from 5-6 p.m. During the open house, project information will be available for review and project team members will be available to answer questions. Technical presentations will begin at 6 p.m. and will be followed by a public comment period.

All interested citizens are encouraged to attend the public hearing and provide input on the project. Verbal and written comments may be presented at the public hearing. Written comments not submitted at the public hearing may also be submitted to: TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Box 15426, Austin, Texas 78761-5426. Comments will also be accepted at the project website. All comments received by Wednesday, Aug. 13, 2014, will be included in the official public hearing record.

The public hearing will be conducted in English. Persons interested in attending the public hearing who require auxiliary aids or services, such as interpreters, are requested contact Stacey Benningfield at (512) 832-7369 at least five business days prior to the public hearing so appropriate arrangements may be made. TxDOT will make every reasonable effort to accommodate communication or accessibility needs.

Description: The proposed project would entail construction of a new location, limited access toll road extending from State Loop 1 (MoPac) to FM 1626 - a distance of approximately four miles. The preferred alternative would consist of four 12-foot travel lanes (two in each direction); 10-foot outside shoulders; four-foot inside shoulders; and a 10-foot wide bicycle and pedestrian shared use path. It would be located within pre-existing state-owned right of way that varies in width between 300 and 600 feet. No additional right of way would be required to accommodate the proposed facility/preferred alternative and no residential or business displacements would result from implementation. The project area is partially located in the Edwards Aquifer recharge zone. SH 45SW is identified in the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan.

The purpose of the proposed project is to improve system connectivity, local mobility and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis counties. Six preliminary alternatives were evaluated in the Draft Environmental Impact Statement (DEIS). Subsequently, the DEIS evaluated the social, economic and environmental impacts of one build alternative (the preferred alternative described above) and the no-build alternative.

The DEIS, maps and other information concerning the proposed project are available for public inspection at the TxDOT Austin District Office, located at 7901 N. I-35, Austin, TX 78753. In addition, the DEIS is on file and available for public inspection at the following locations:

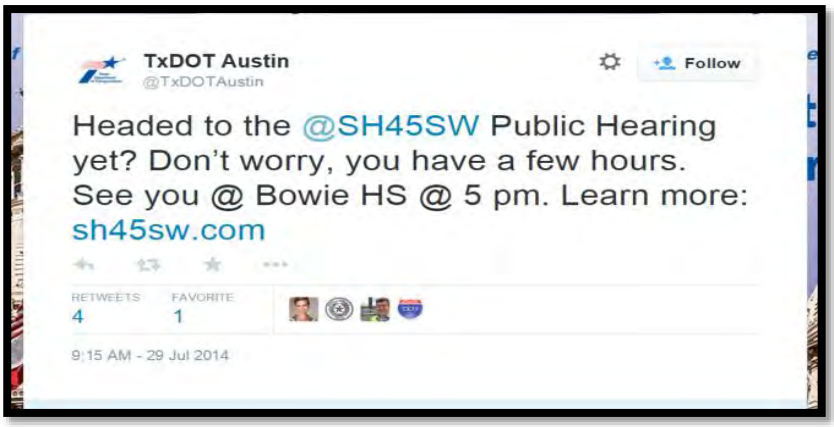
1. TxDOT Environmental Affairs Division, 118 E. Riverside Drive, Austin, TX 78704;
2. Austin Public Library, Hampton Branch at Oak Hill, 5125 Convict Hill Road, Austin, TX 78749;
3. Austin Public Library, Pleasant Hill Branch, 211 E. William Cannon Drive, Austin, TX 78745;
4. Buda Public Library, 303 Main St., Buda, TX 78610.

The DEIS is also available on the SH 45SW project website. A paper copy and other information about the project may be obtained at the requestor's expense by writing to: Texas Department of Transportation Austin District, Attention Stacey Benningfield, P.O. Box 15426, Austin, TX 78761-5426, or by email.

Contact: Stacey Benningfield

TXDOT Tweets about SH 45 SW Public Meeting (1-3)

1



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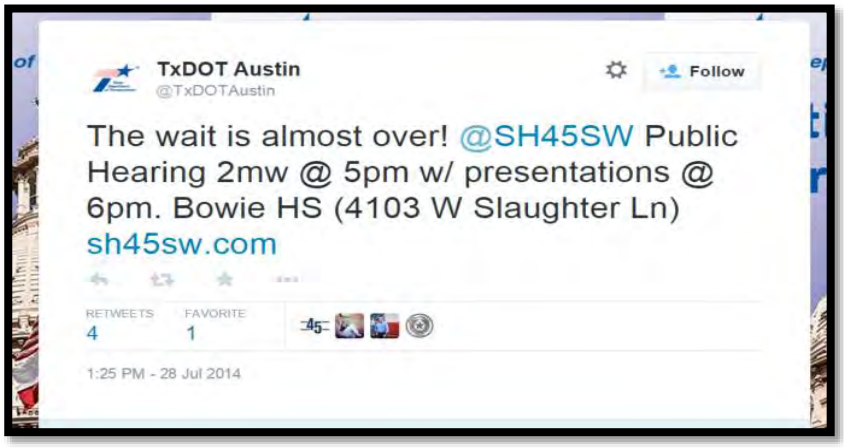

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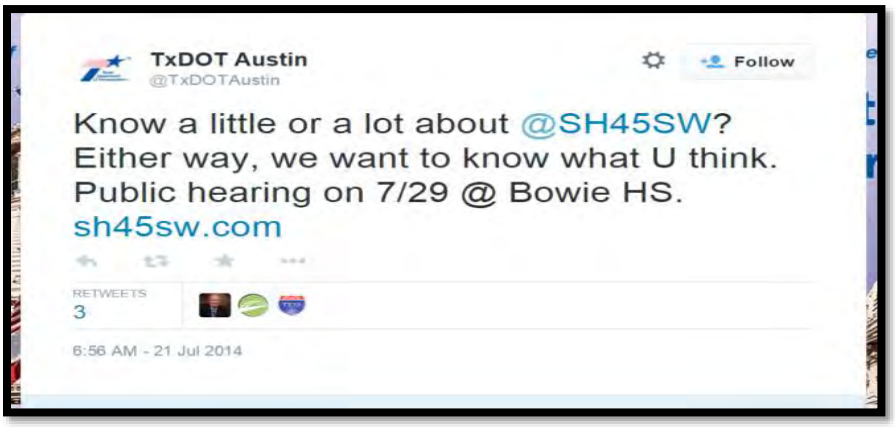
TXDOT Tweets about SH 45 SW Public Meeting (4-5)

4



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SH 45 SW Tweets 1-3

1

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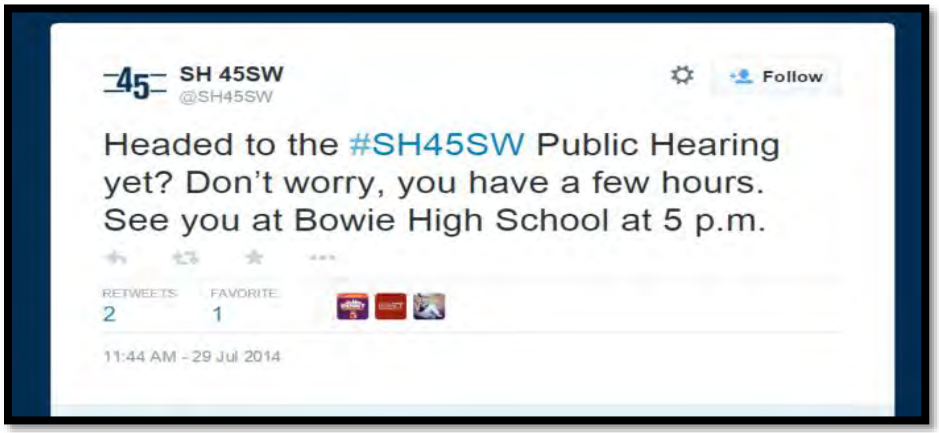
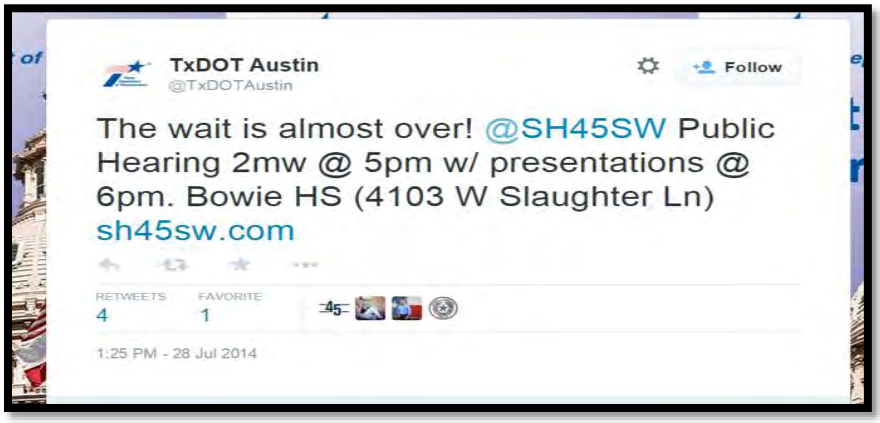


SH 45 SW Tweets 4-6

4 *retweet from TXDOT*



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SH 45 SW Tweets 7-8

7

8

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SH 45 SW
ENVIRONMENTAL STUDY

Attachment C

Public Hearing Informational Materials

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Presentation

SH 45SW
Public Hearing

WELCOME!

SH 45SW
ENVIRONMENTAL STUDY

PUBLIC HEARING FORMAT

- Open house
- Public hearing
  - o Overview
  - o Technical presentation
- Break
- Public comment period
- Adjourn

SH 45SW ENVIRONMENTAL STUDY

WHY AM I HERE?

To review, discuss, and provide input on the SH 45SW project

SH 45SW ENVIRONMENTAL STUDY

PUBLIC HEARING COMMENTS

Verbal Comments

- Provide comments during public hearing comment period
  - o Submit speaker registration card
  - o Limited to 3 minutes per registered speaker
- Submit comment directly to the court reporter

SH 45SW ENVIRONMENTAL STUDY

PUBLIC HEARING COMMENTS

Written Comments

- Place in comment box
- Mail, fax or submit online by **Wednesday, August 13, 2014:**
  - o TxDOT Austin District
    Environmental Coordinator
    P.O. Box 15426
    Austin, TX 78761-5426
  - o Fax: (512) 832-7157
  - o Online: www.SH45SW.com

SH 45SW ENVIRONMENTAL STUDY

SH 45SW
ENVIRONMENTAL STUDY

Project Location

SH 45SW
ENVIRONMENTAL STUDY

EIS Process Overview

- **Project funded by TxDOT, the Mobility Authority, and Travis and Hays counties**
- **EIS developed pursuant to rules governing non-federal projects**

Land Use	Vegetation
Socioeconomic Resources	Threatened and Endangered Species
Geology and Soils	Archeological Resources
Air Quality	Historic Resources
Noise Environment	Hazardous Materials
Groundwater Resources	Visual and Aesthetic Qualities
Surface Water Resources	Indirect and Cumulative Impacts

SH 45SW ENVIRONMENTAL STUDY

Purpose: What are we trying to do?

- Improve system connectivity and local mobility
- Improve travel times
- Provide an efficient alternate route to congested local roadways

SH 45SW ENVIRONMENTAL STUDY

Need: What challenges are we trying to address?

- Lack of efficient, direct routes
- Long travel times on existing routes
- Delays on the local roadway network

SH 45SW ENVIRONMENTAL STUDY

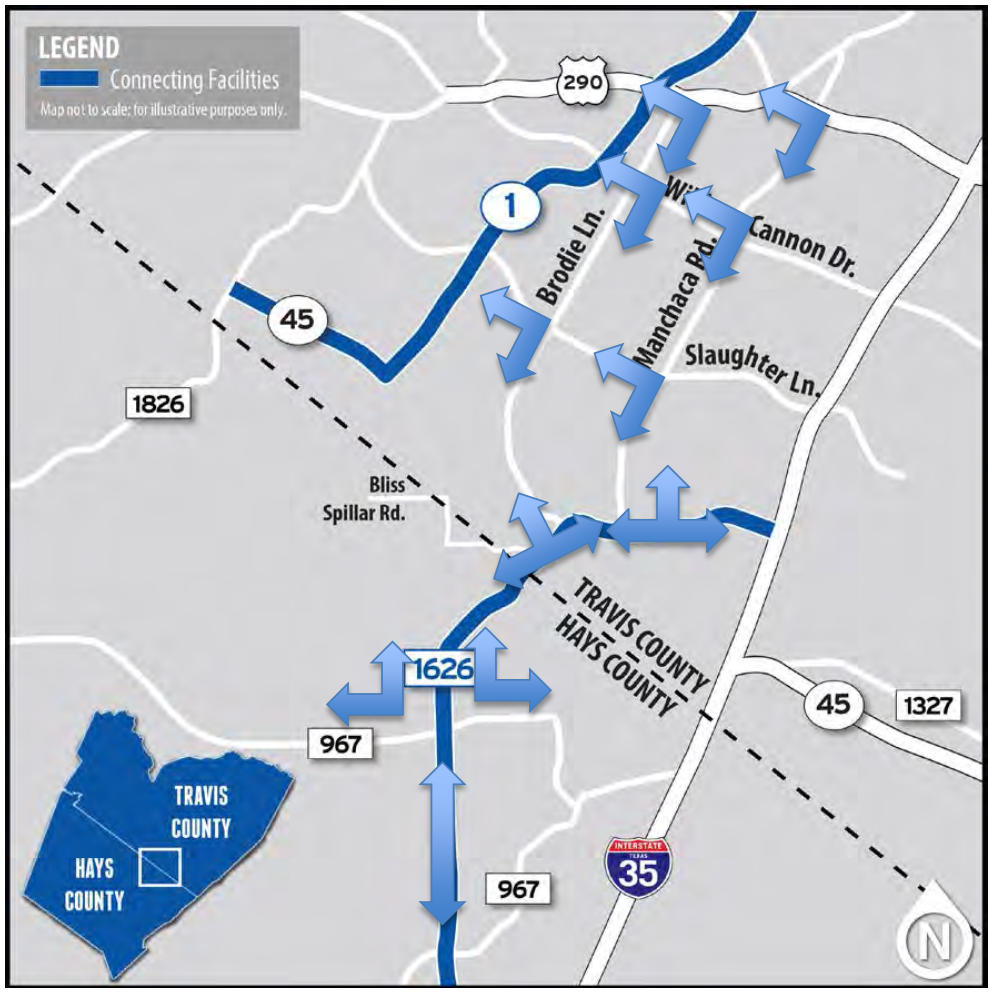
Need: What the traffic model tells us.

- Traffic utilizing local street network between Hays and Travis Counties is projected to increase by 50% between 2013 and 2035
- From 210,000 vehicles per day in 2013 to 314,000 vehicles per day in 2035.

SH 45SW ENVIRONMENTAL STUDY

Need: What the traffic model tells us.

- Current and future traffic will continue to use the local street network to access Mopac (Loop 1)



Need: What the traffic model tells us.

- A decrease of travel times (on average) of 25% in the AM and PM peak periods on local streets with a freeway connection between Mopac and FM 1626

SH 45SW ENVIRONMENTAL STUDY

Alternatives Considered

- No build
- Transportation System Management (signal timing, intersection improvements, etc.)
- Travel Demand Management (telecommuting, mass transit)
- Upgrade one or more existing roadways
- New tollway on new location

Preferred Alternative

- New tollway on existing state-owned right-of-way

SH 45SW ENVIRONMENTAL STUDY

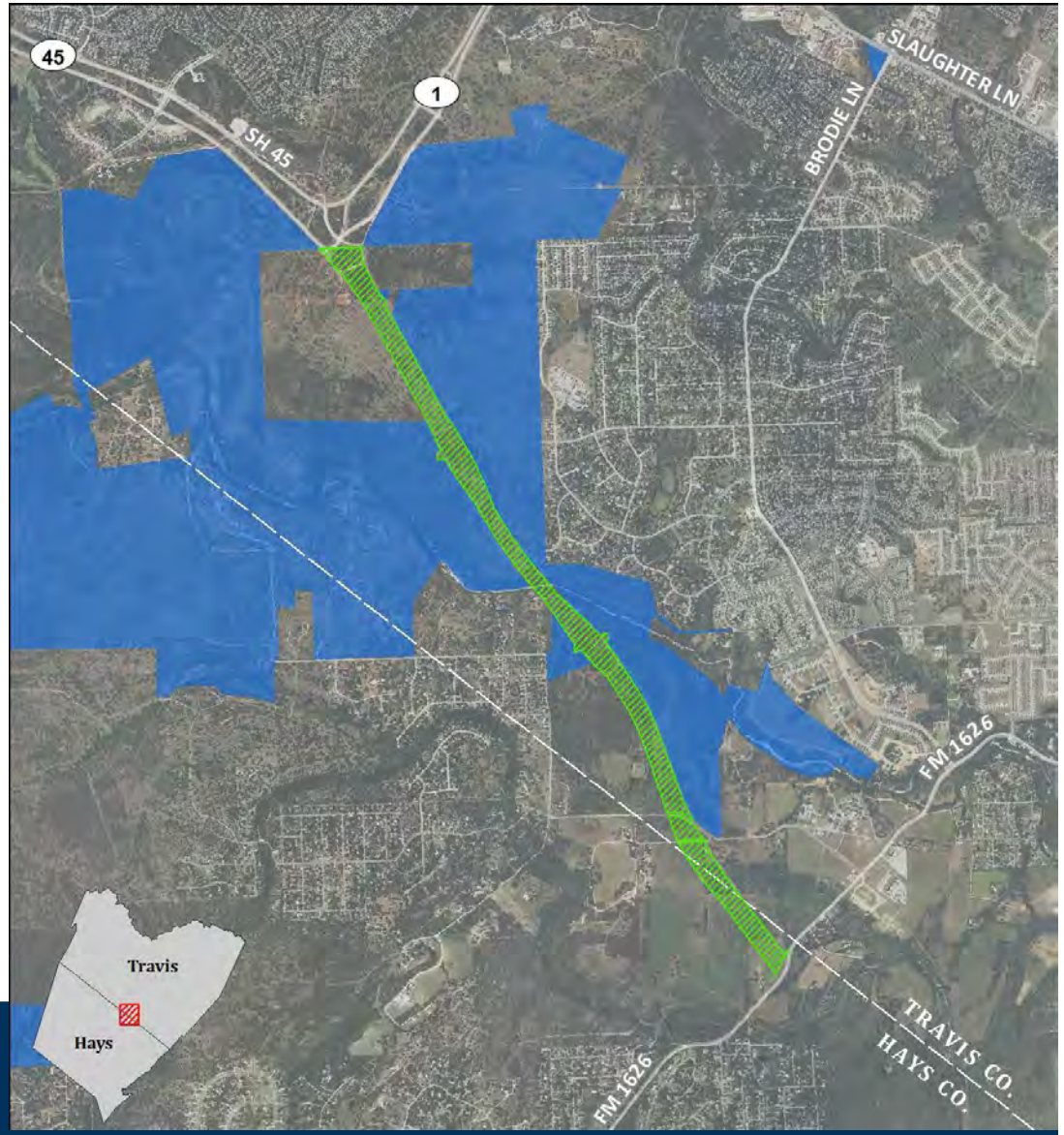
The Preferred Alternative

Consistent with Purpose and Need?	☑
No residential relocations?	☑
No commercial displacements?	☑
No direct impacts to Water Quality Protection Lands?	☑
No right-of-way acquisition needed?	☑
Minimal impacts to existing neighborhoods?	☑
Consistent with regional planning efforts?	☑
Improved system connectivity and local mobility?	☑
Improved travel times?	☑
Provides alternate route to congested local roadways?	☑
No harm to threatened and endangered species?	☑

SH 45SW ENVIRONMENTAL STUDY

Human Environment

- Land Use
- Archeological Resources
- Socioeconomic Resources
- Air Quality
- Noise
- Historic Resources



SH 45SW
ENVIRONMENTAL STUDY

Natural Environment

- Geologic Features
- Streams and Wetlands
- Vegetation

SH 45SW ENVIRONMENTAL STUDY

Natural Environment: Water Quality

Vegetative Filter Strips

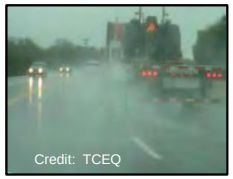
Grassy Swales

Silt Fencing

Water Quality Ponds

PFC Pavement

VS.



Traditional Pavement

- Project is over Barton Springs Segment of Edwards Aquifer Recharge Zone
- TCEQ Edwards Aquifer Rules require 80% removal of the increase in Total Suspended Solids (TSS) which is used as a marker for pollutants in runoff
- Proposed project's water quality protection measures would remove more than 90% of TSS generated over the Recharge Zone

SH 45SW ENVIRONMENTAL STUDY

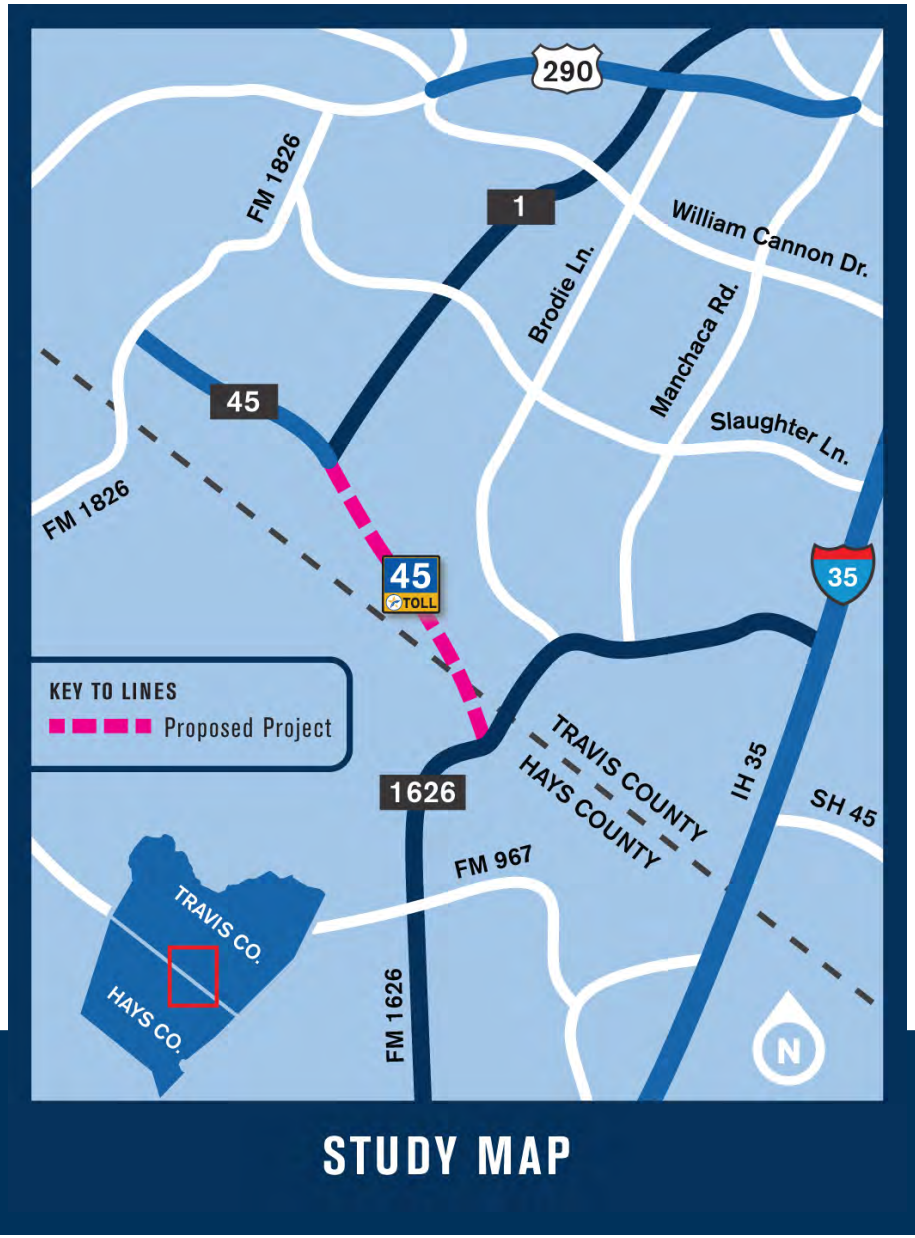
Natural Environment: Threatened and Endangered Species

Golden-cheeked Warbler

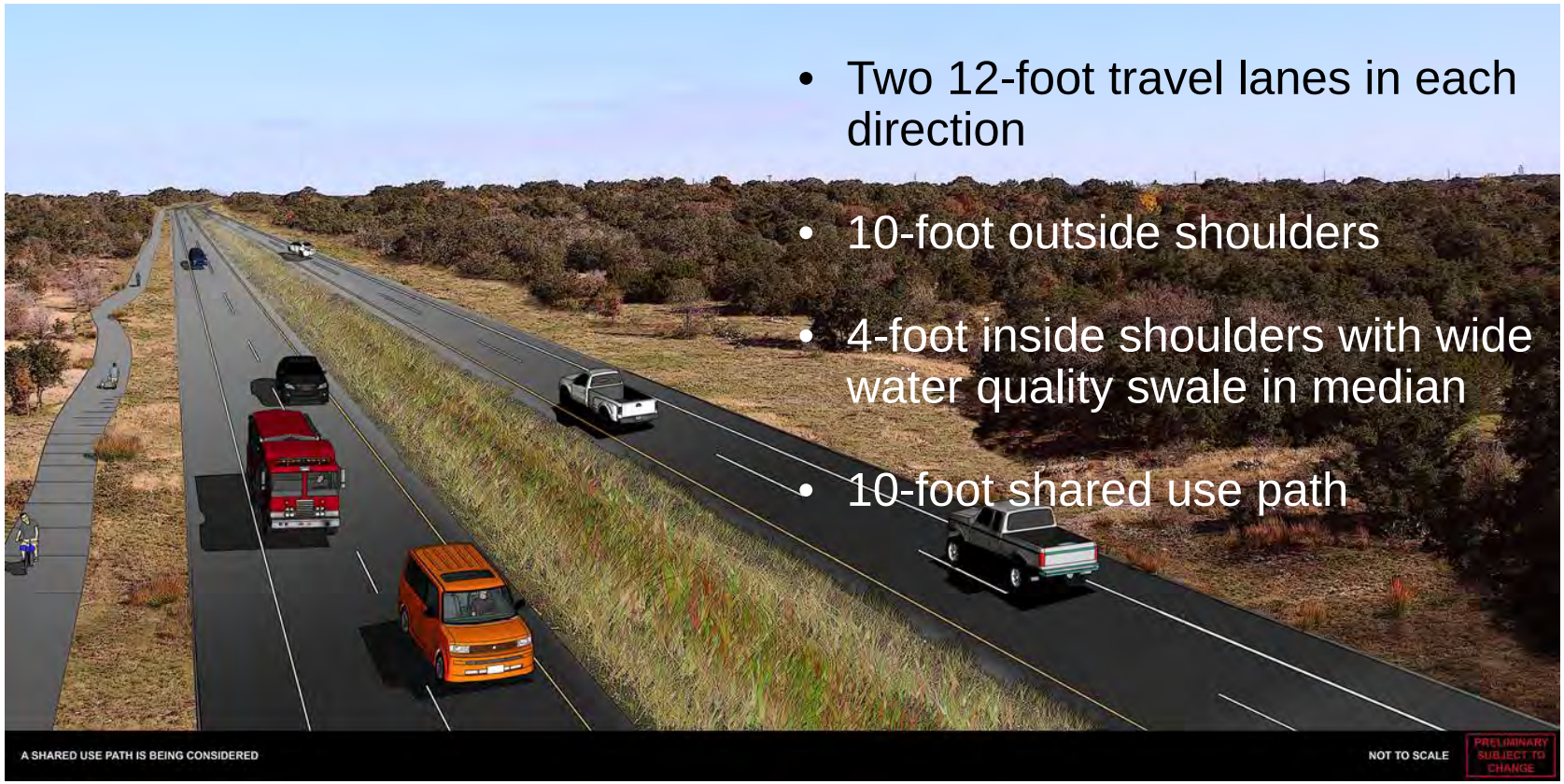
Austin Blind and Barton Springs salamanders

SH 45SW ENVIRONMENTAL STUDY

Location Map

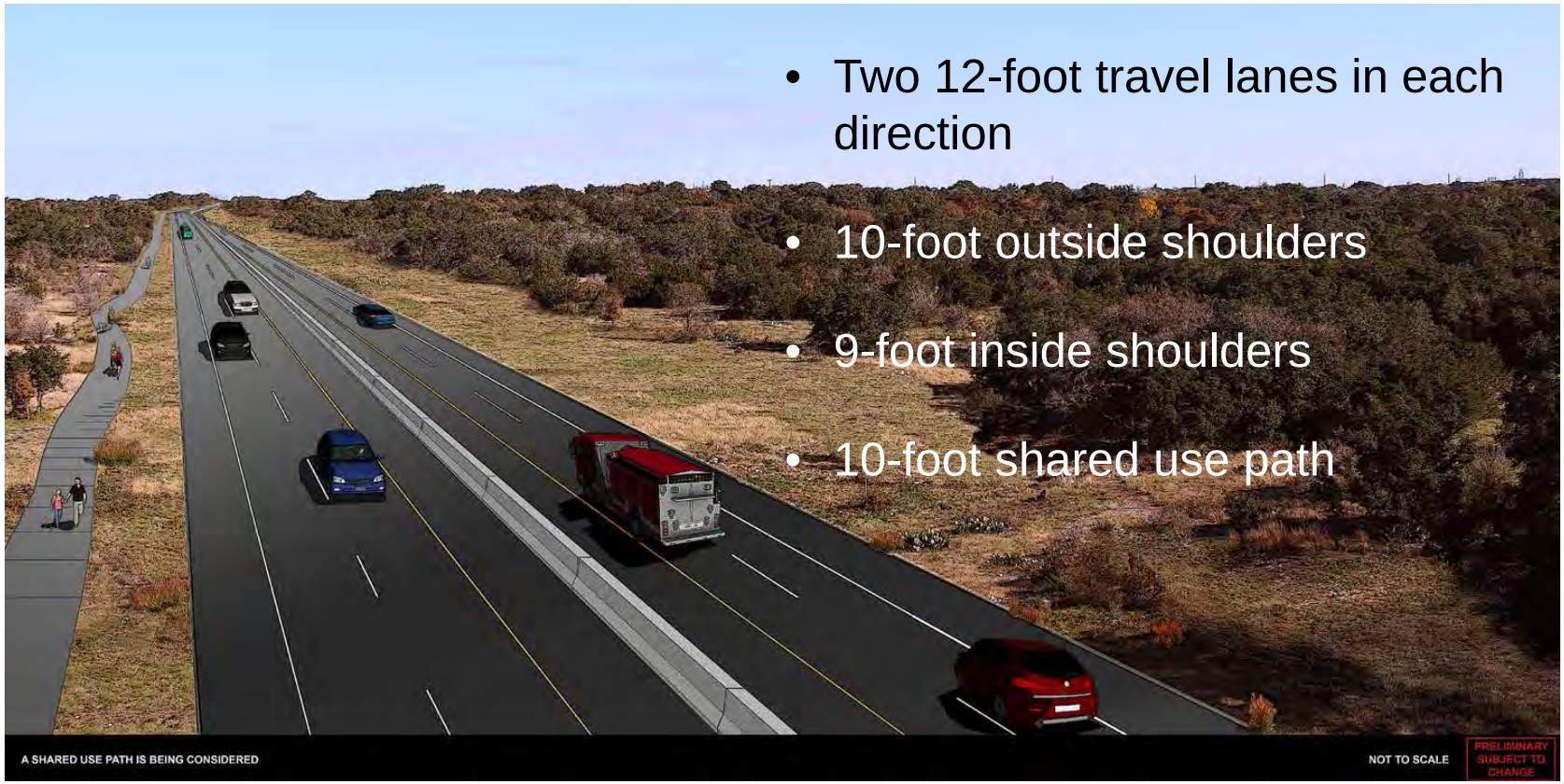


SH 45SW ENVIRONMENTAL STUDY



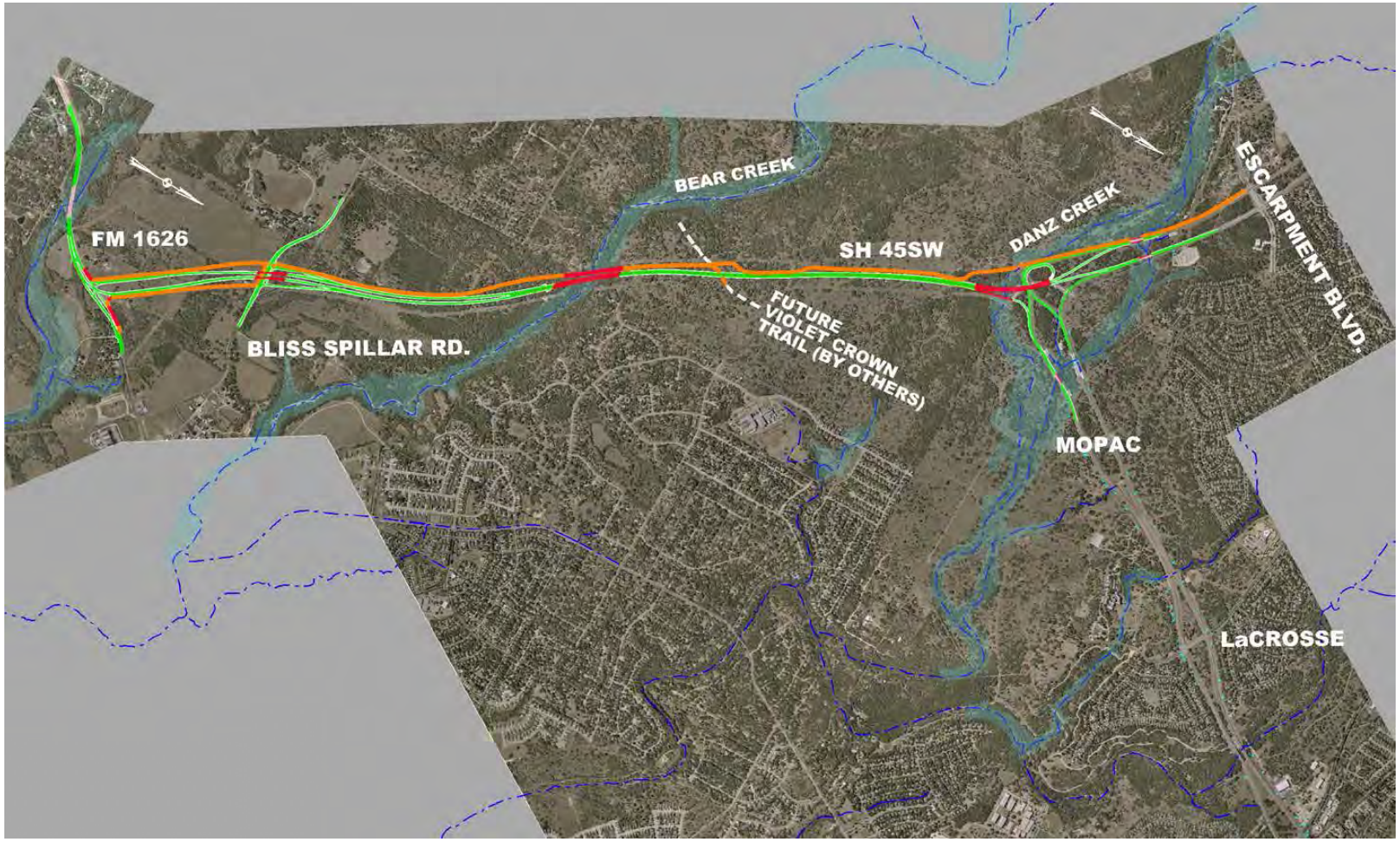
Typical Section 1: FM 1626 to Bear Creek

SH 45SW ENVIRONMENTAL STUDY



Typical Section 2: Bear Creek to MoPac

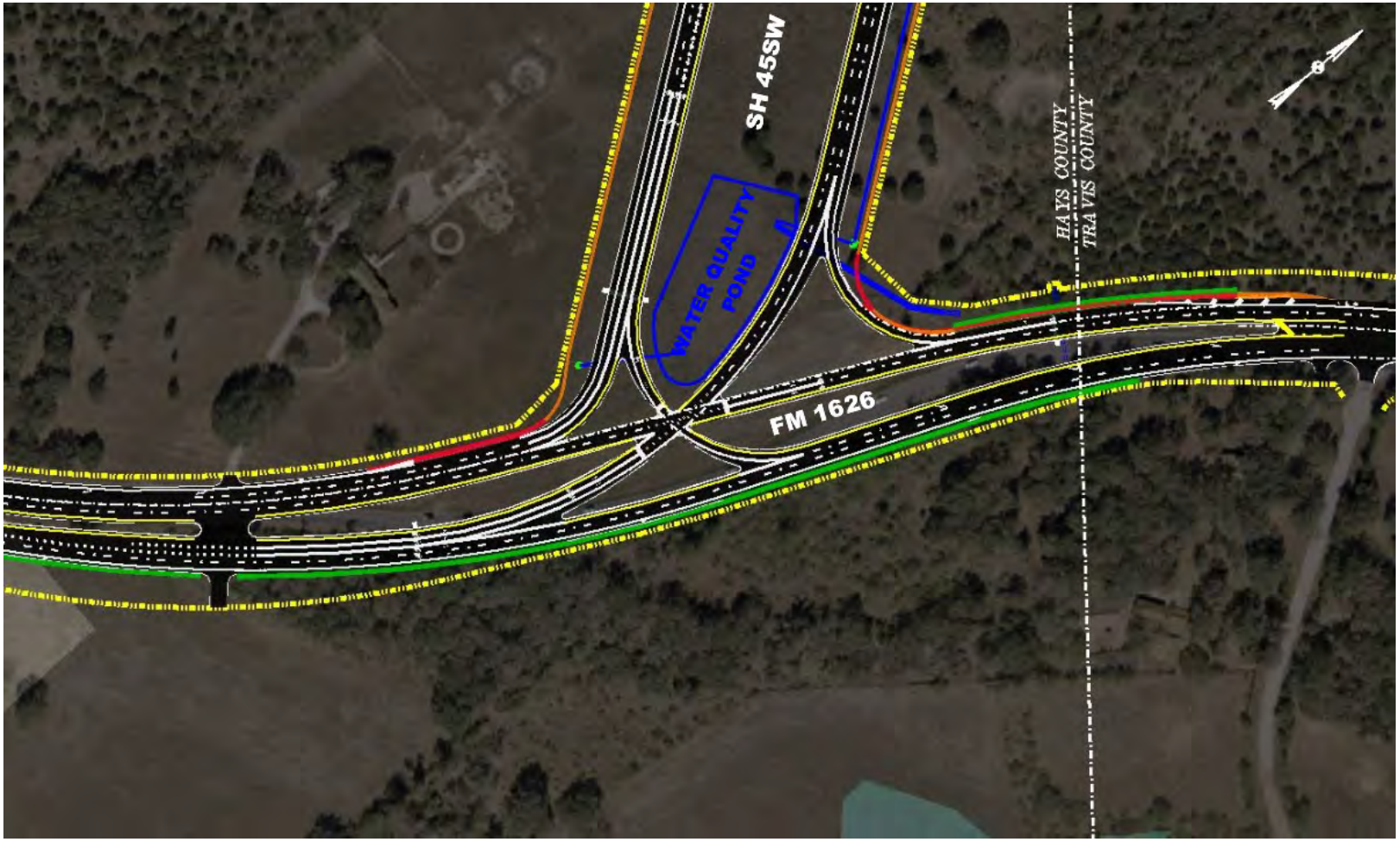
SH 45SW ENVIRONMENTAL STUDY



SH 45 SW
ENVIRONMENTAL STUDY

LEGEND

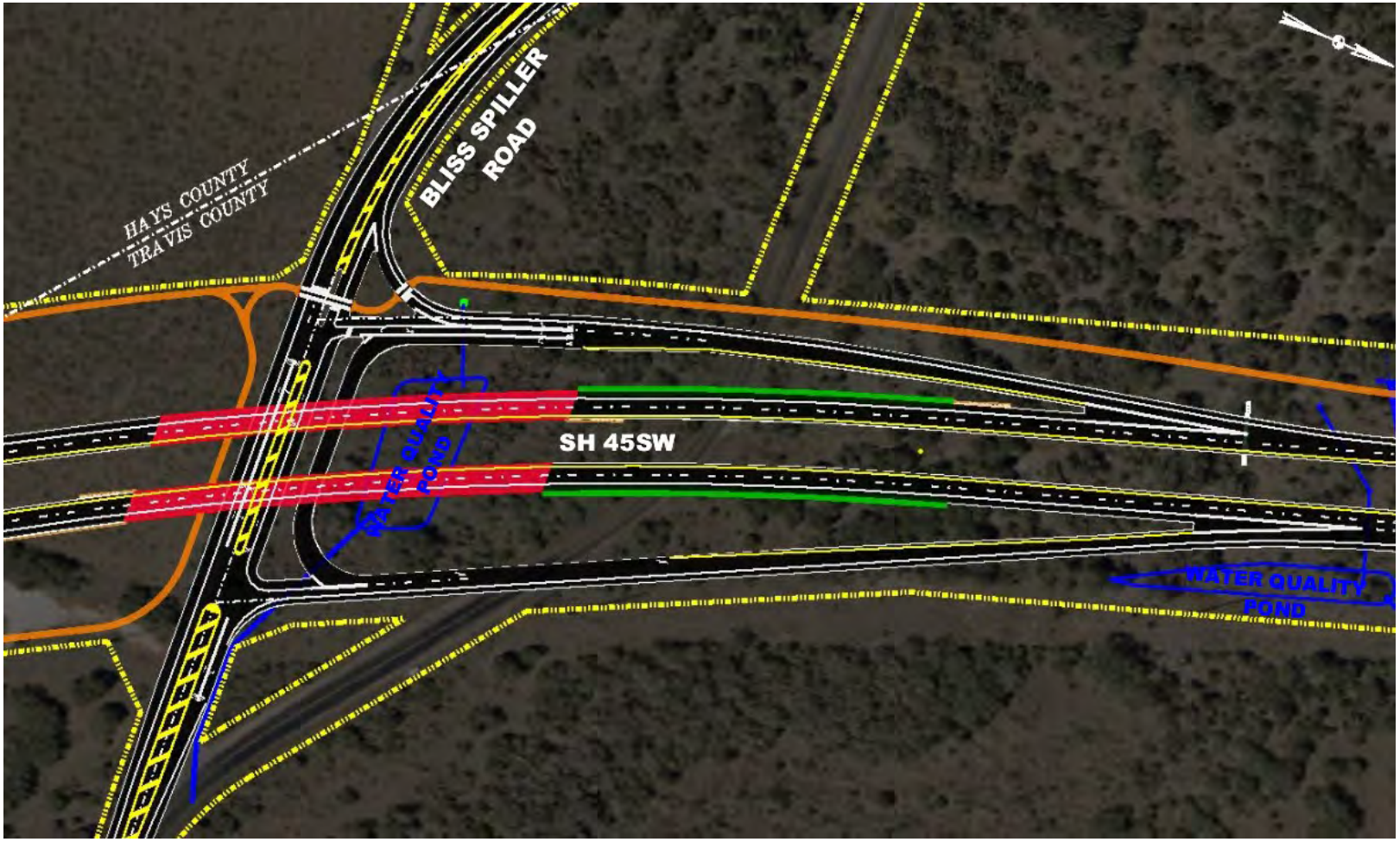
- PAVEMENT
- BRIDGES
- SHARED USE PATHS
- FLOODPLAINS
- CREEKS
- EXISTING R.O.W.



SH 45SW
ENVIRONMENTAL STUDY

LEGEND

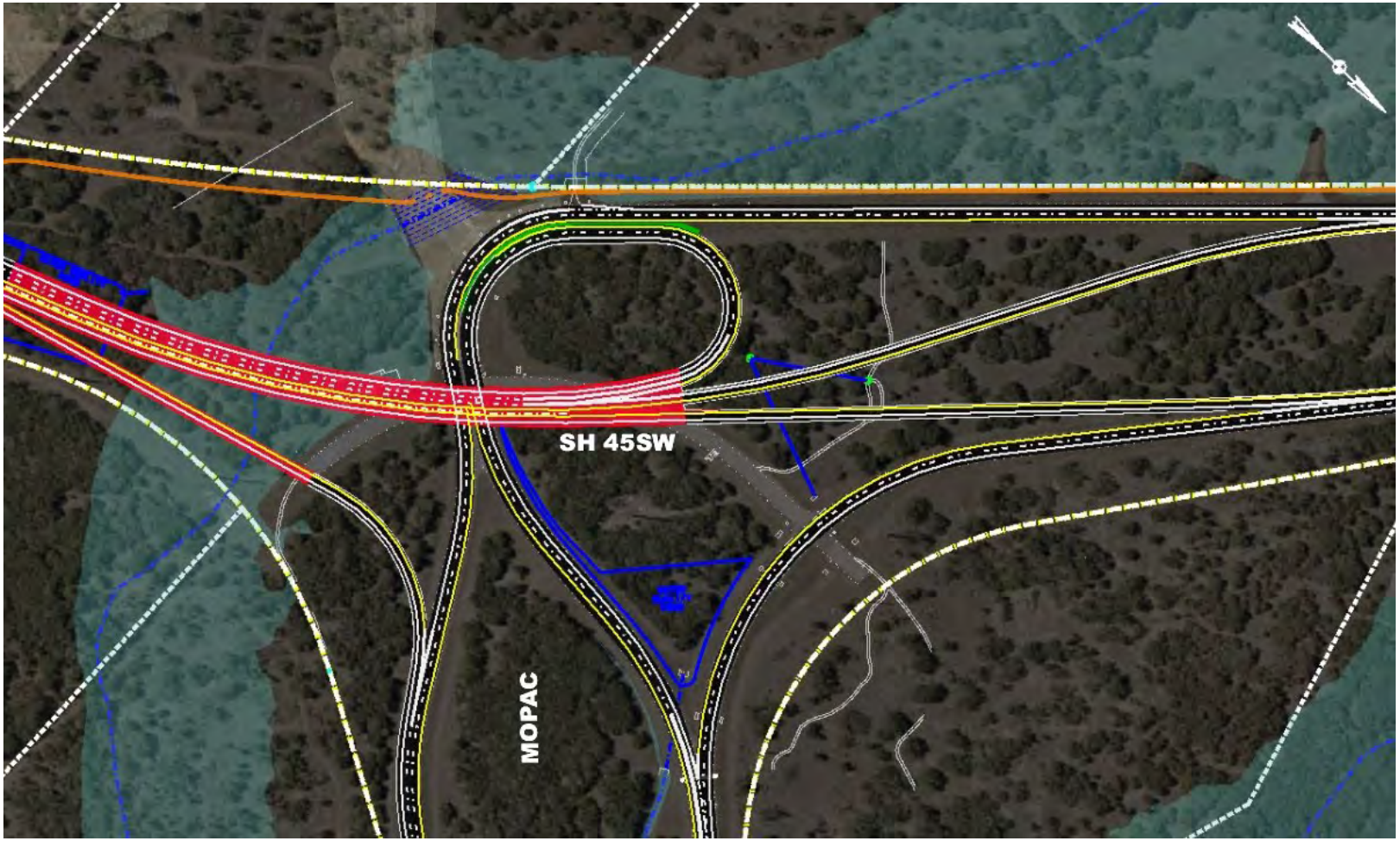
- PAVEMENT
- BRIDGES
- SHARED USE PATHS
- EXISTING R.O.W.
- RETAINING WALL
- DRAINAGE / WATER QUALITY PONDS



SH 45 SW
ENVIRONMENTAL STUDY

LEGEND

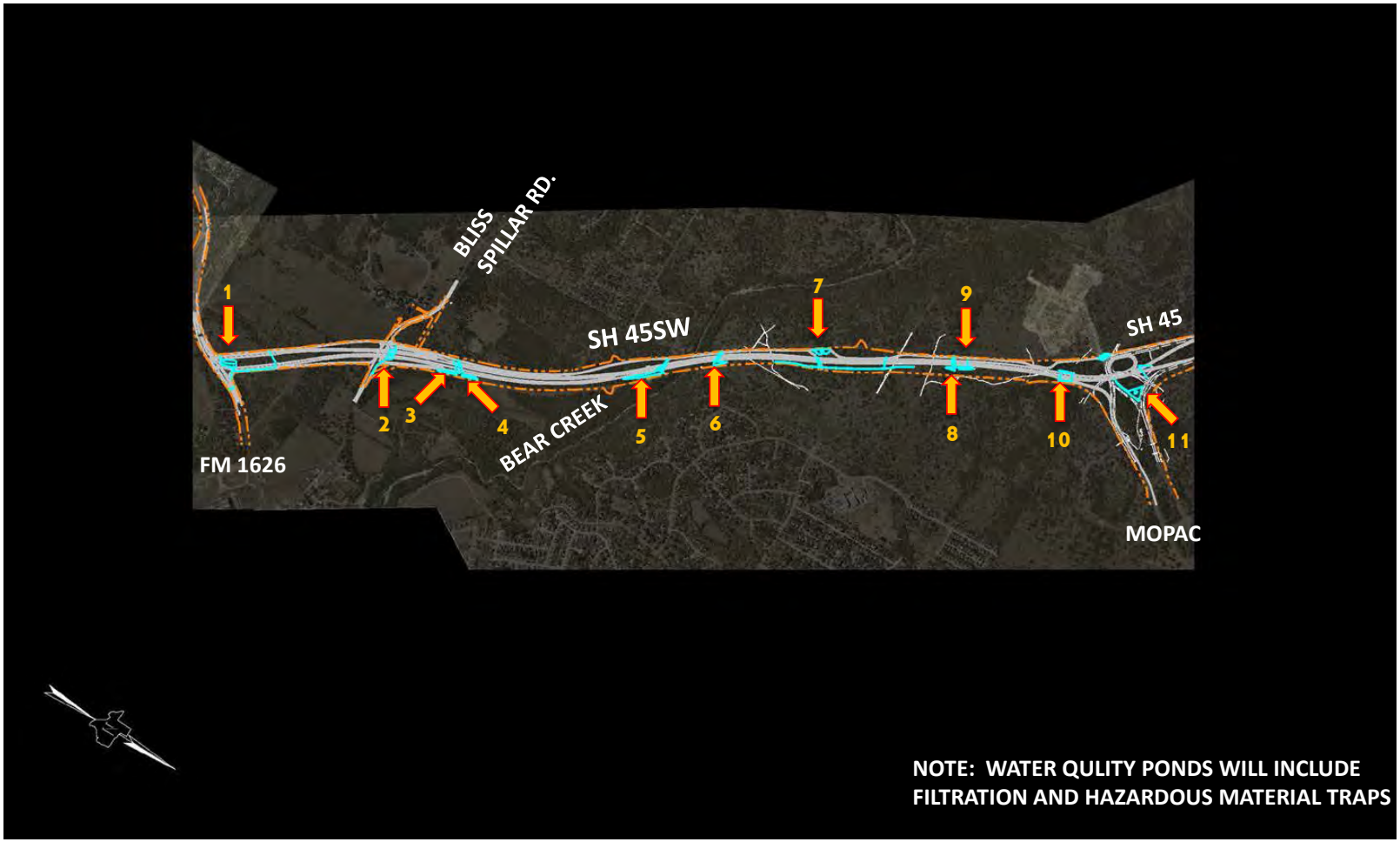
- PAVEMENT
- BRIDGES
- SHARED USE PATHS
- EXISTING R.O.W.
- RETAINING WALL
- DRAINAGE / WATER QUALITY PONDS



SH 45SW
ENVIRONMENTAL STUDY

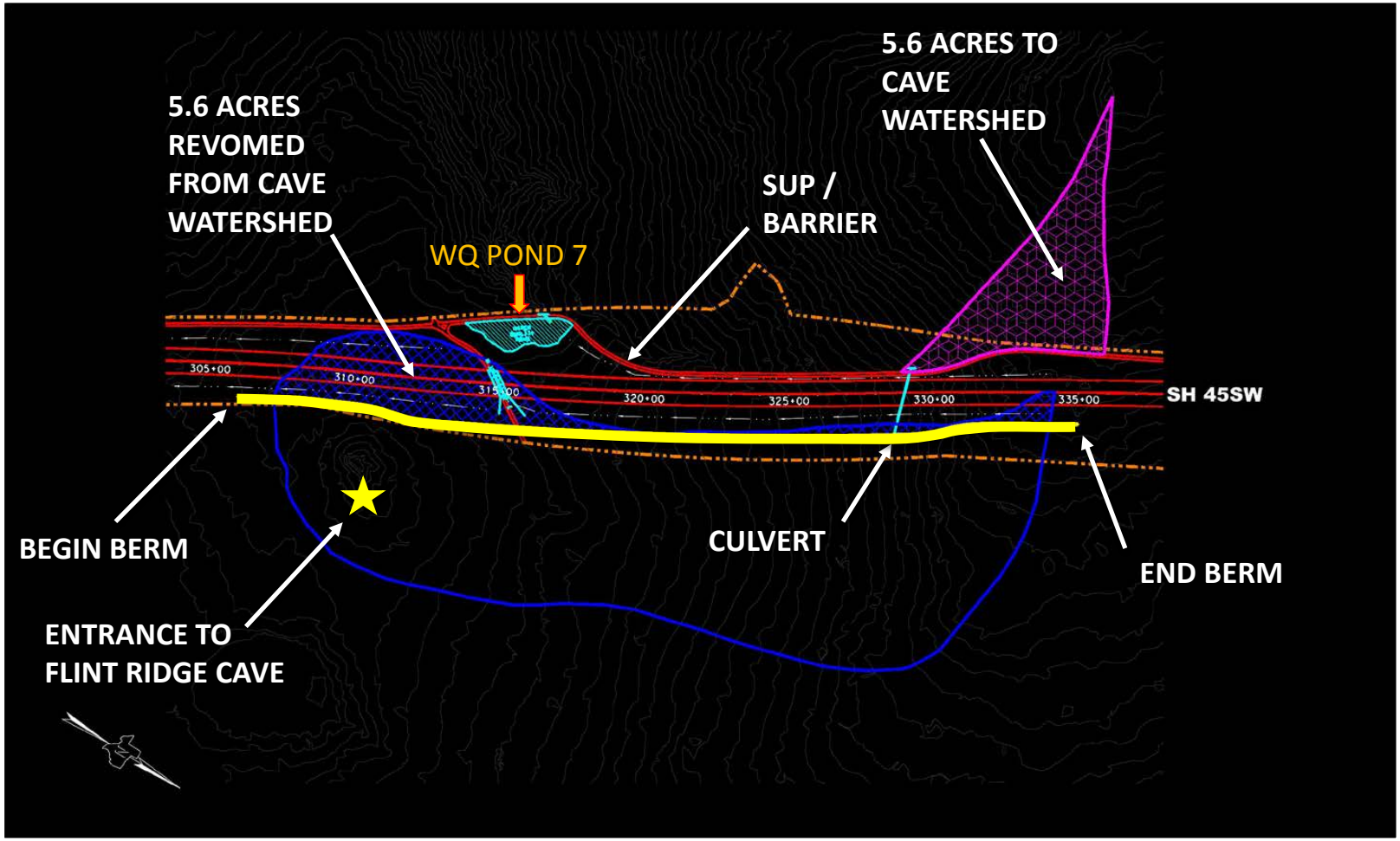
LEGEND

PAVEMENT
BRIDGES
SHARED USE PATHS
EXISTING R.O.W.
RETAINING WALL
DRAINAGE / WATER QUALITY PONDS



SH 45 SW
ENVIRONMENTAL STUDY

WATER QUALITY PONDS



SH 45SW ENVIRONMENTAL STUDY

Best Management Practices (BMPs) during construction

Natural Buffers around sensitive features:

- Vegetation in its natural state
- Minimize construction inside buffer
- No pesticides or fertilizer in buffer
- Temporary runoff protection
- No drainage outfall in buffer
- Fenced with orange construction fencing
- Storage, maintenance, or vehicles are prohibited
- Buffer Zone Maintenance Plan

SH 45SW ENVIRONMENTAL STUDY

No additional right-of-way is anticipated for the project

SH 45SW ENVIRONMENTAL STUDY

BREAK

SH 45SW ENVIRONMENTAL STUDY

PUBLIC COMMENT SESSION

SH 45SW ENVIRONMENTAL STUDY

PUBLIC COMMENT PERIOD

- Use Microphone
- State your full name
- Comment on issues relevant to SH 45SW Environmental Study
- 3-minute time limit per speaker

SH 45SW ENVIRONMENTAL STUDY

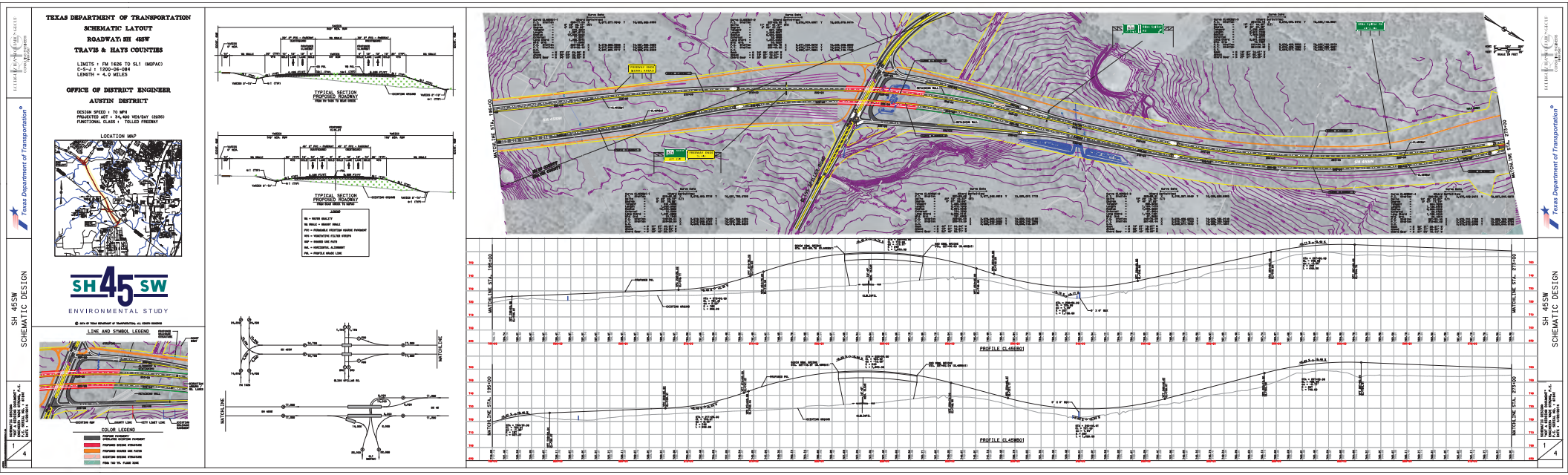
PUBLIC COMMENT PERIOD

Written Comments

- Place in comment box
- Mail, fax or submit online by **Wednesday, August 13, 2014:**
  - TxDOT Austin District
    Environmental Coordinator
    P.O. Box 15426
    Austin, TX 78761-5426
  - Fax: (512) 832-7157
  - Online: www.SH45SW.com

SH 45SW ENVIRONMENTAL STUDY

Exhibits


TEXAS DEPARTMENT OF TRANSPORTATION
SCHEMATIC LAYOUT
ROADWAY: SH 45SW
TRAVIS & HAYS COUNTIES
LIMITS : FM 1626 TO SL1 (MOPAC)
C-S-J : 1200-06-084
LENGTH = 4.0 MILES
OFFICE OF DISTRICT ENGINEER
AUSTIN DISTRICT
DESIGN SPEED : 70 MPH
PROJECTED ADT : 34,400 VEH/DAY (2036)
FUNCTIONAL CLASS : TOLLED FREEWAY
LOCATION MAP
SH 45 SW
ENVIRONMENTAL STUDY
LINE AND SYMBOL LEGEND
COLOR LEGEND
TYPICAL SECTION PROPOSED ROADWAY
PROFILE CL45E001
PROFILE CL45W001
SH 45SW SCHEMATIC DESIGN
Texas Department of Transportation

TEXAS DEPARTMENT OF TRANSPORTATION

SCHEMATIC LAYOUT

ROADWAY: SH 45SW

TRAVIS & HAYS COUNTIES

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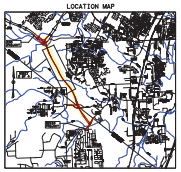
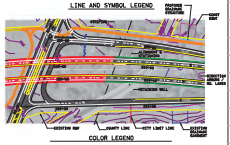


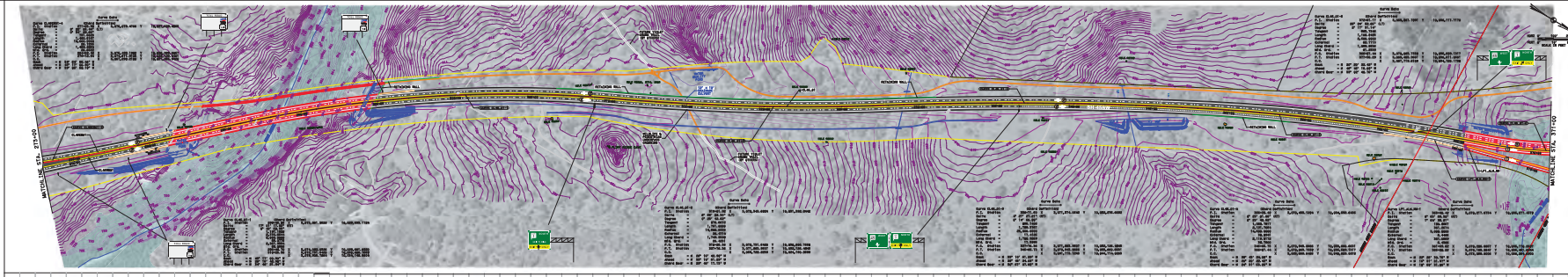
SH 45 SW

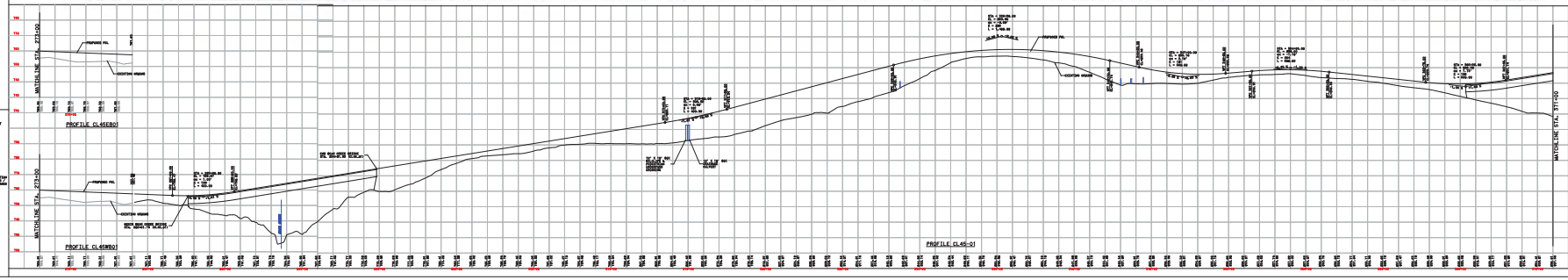
ENVIRONMENTAL STUDY

LINE AND SYMBOL LEGEND

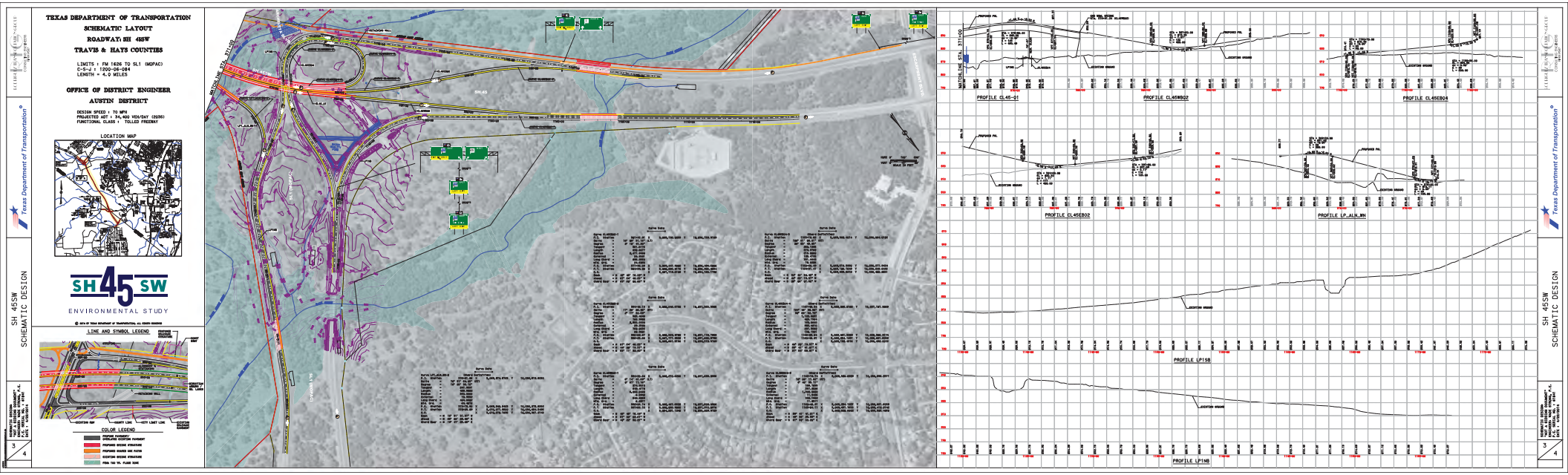


COLOR LEGEND





SH 45SW
SCHEMATIC DESIGN


TEXAS DEPARTMENT OF TRANSPORTATION
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LOCATION MAP
SH 45 SW
ENVIRONMENTAL STUDY
LINE AND SYMBOL LEGEND
COLOR LEGEND
PROFILE CL45-01
PROFILE CL45WB02
PROFILE CL45EB04
PROFILE CL45EB02
PROFILE LP_ALN_WN
PROFILE LP1SB
PROFILE LP1NB
SH 45SW
SCHEMATIC DESIGN
Texas Department of Transportation

TEXAS DEPARTMENT OF TRANSPORTATION

SCHEMATIC LAYOUT

ROADWAY: SH 45SW

TRAVIS & HAYS COUNTIES

LIMITS : FM 1626 TO SL1 (MOPAC)
C-5-J : 1200-06-084
LENGTH = 4.0 MILES

OFFICE OF DISTRICT ENGINEER

AUSTIN DISTRICT

DESIGN SPEED : 70 MPH
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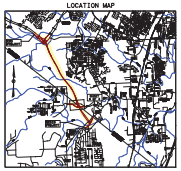
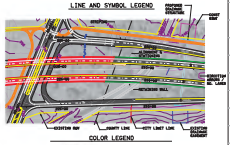
LOCATION MAP



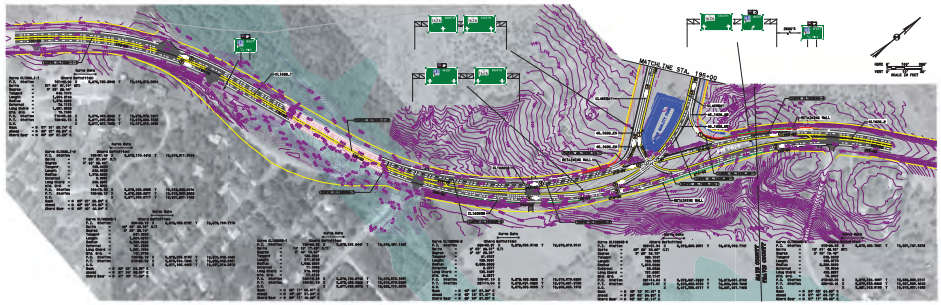
SH 45 SW

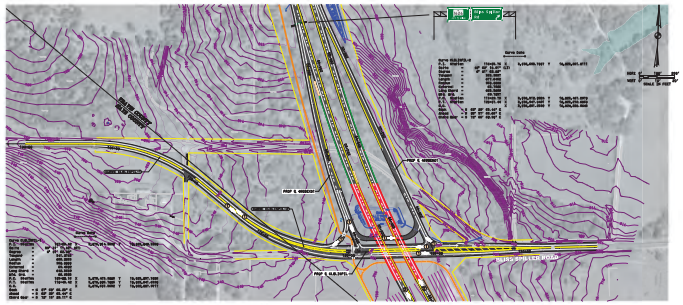
ENVIRONMENTAL STUDY

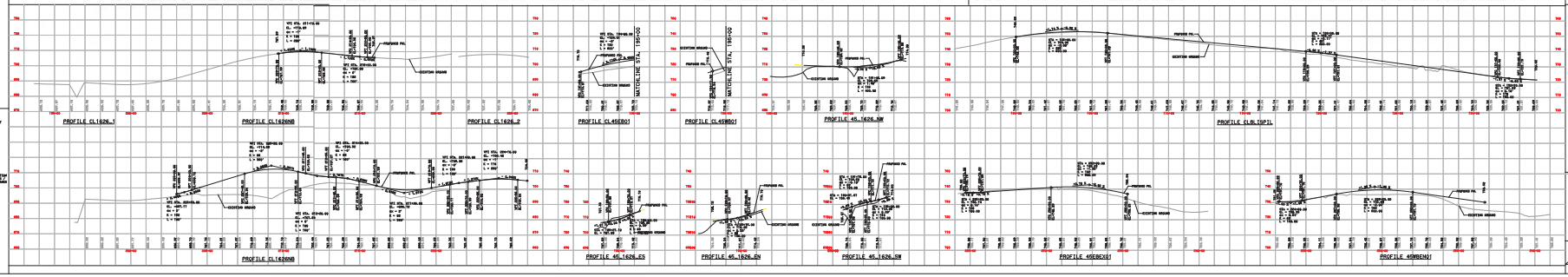
LINE AND SYMBOL LEGEND



COLOR LEGEND







PROFILE CL1626_1

PROFILE CL1626NB

PROFILE CL1626_2

PROFILE CL45EB01

PROFILE CL45WB01

PROFILE 45_1626_SW

PROFILE CL8_ISP1L

PROFILE CL1626NB

PROFILE 45_1626_ES

PROFILE 45_1626_EN

PROFILE 45_1626_SW

PROFILE 45EB0101

PROFILE 45WB0101

SH 45SW SCHEMATIC DESIGN

Texas Department of Transportation

SH 45SW
Public Hearing

WELCOME!

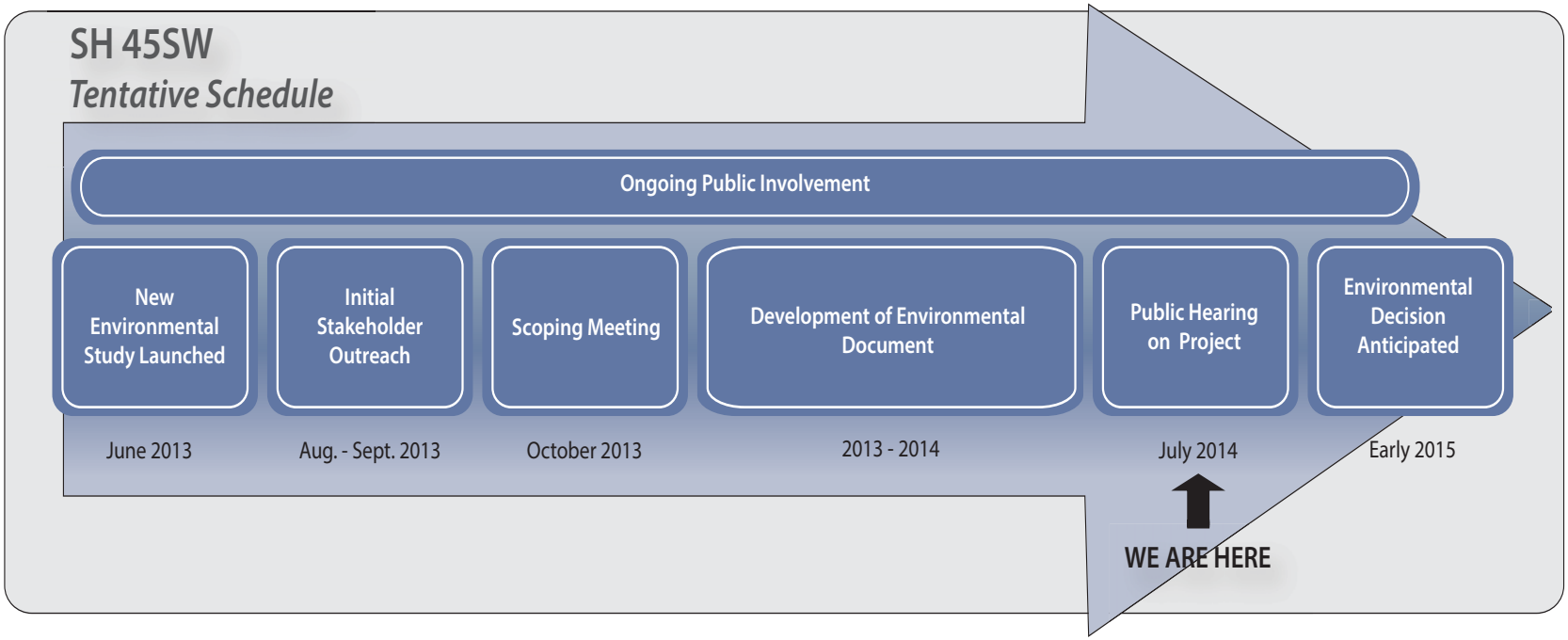
SH 45 SW
ENVIRONMENTAL STUDY

WHY AM I HERE?

To review, discuss and provide input on the SH 45SW project

SH 45SW ENVIRONMENTAL STUDY

SCHEDULE



SH 45SW
ENVIRONMENTAL STUDY

PURPOSE AND NEED

Purpose: What are we trying to do?

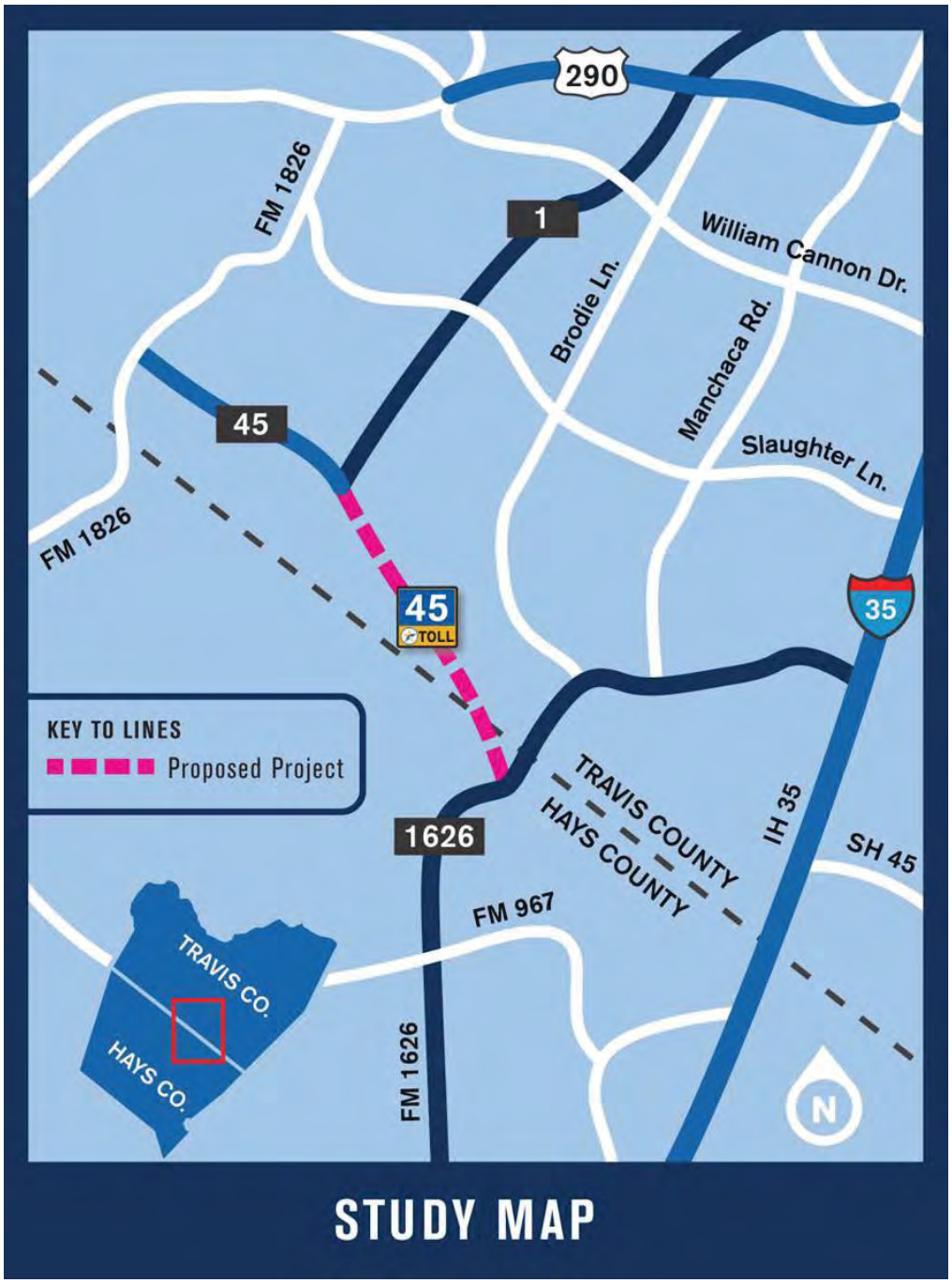
- Improve system connectivity and local mobility
- Improve travel times
- Provide an efficient alternate route to congested local roadways

Need: What problems are we trying to address?

- Lack of efficient, direct routes connecting northern Hays County to Travis County and Austin
- Existing circuitous routes, combined with numerous signalized intersections, contribute to long travel times
- Traffic congestion causes delays on the local roadway network

SH 45SW ENVIRONMENTAL STUDY

PROJECT LOCATION



SH 45 SW

ENVIRONMENTAL STUDY

ALTERNATIVES CONSIDERED

- No build
- Transportation System Management (TSM)
- Travel Demand Management (TDM)
- Upgrade of one or more existing roadways
- New tollway on new location
- **New tollway on existing state-owned right-of-way**

Preferred Alternative

SH 45SW ENVIRONMENTAL STUDY

BASIS FOR IDENTIFICATION OF PREFERRED ALTERNATIVE

Consistent with Purpose and Need?	Yes
Residential Relocations	0 relocations
Commercial Displacements	0 displacements
Water Quality Protection Lands directly impacted	None
Right-of-way that would be acquired	0 acres

New tollway on existing state-owned right-of-way

This alternative was identified as the Preferred Alternative because it:

- Meets the Purpose and Need
- Would not directly impact City of Austin Water Quality Protection Lands
- Avoids relocations or displacements by staying within existing right-of-way
- Minimizes impacts to existing neighborhoods
- Is consistent with regional planning that has occurred over nearly three decades

SH 45SW ENVIRONMENTAL STUDY

WATER QUALITY

If constructed, SH 45SW would be over the Recharge Zone and Transition Zone of the Barton Springs segment of the Edwards Aquifer

- TCEQ Edwards Aquifer Rules require the removal of 80% of added Total Suspended Solids (TSS) from new development to ensure non-degradation of water quality
- Planned SH 45SW water quality protection measures would remove at least 90% of the TSS load generated over the Recharge Zone
- With the Build Alternative's water quality protection measures, sediment in runoff from the project area would be reduced

SH 45SW ENVIRONMENTAL STUDY

WATER QUALITY PROTECTION MEASURES

Vegetative Filter Strips

Grassy Swales

Silt Fencing

Water Quality Ponds

PFC Pavement

VS.

Traditional Pavement

BMPs developed for SH 45SW with input from SH 45SW Water Quality Technical Group (Barton Springs/Edwards Aquifer Conservation District, Central Texas Regional Mobility Authority, city of Austin, Hays County, Texas Department of Transportation, Travis County)

- Water quality management during construction would include:
  - Early installation of permanent water quality features
  - Avoidance of natural drainage from outside the right-of-way mixing with construction runoff prior to treatment
  - Filtering construction runoff
  - Construction oversight by an independent, on-site environmental compliance manager
- Permanent Best Management Practices (BMPs) would include:
  - Permeable Friction Course (PFC) pavement
  - Water quality ponds/hazardous materials traps
  - Vegetative filter strips
  - Grassy swales

SH 45SW ENVIRONMENTAL STUDY

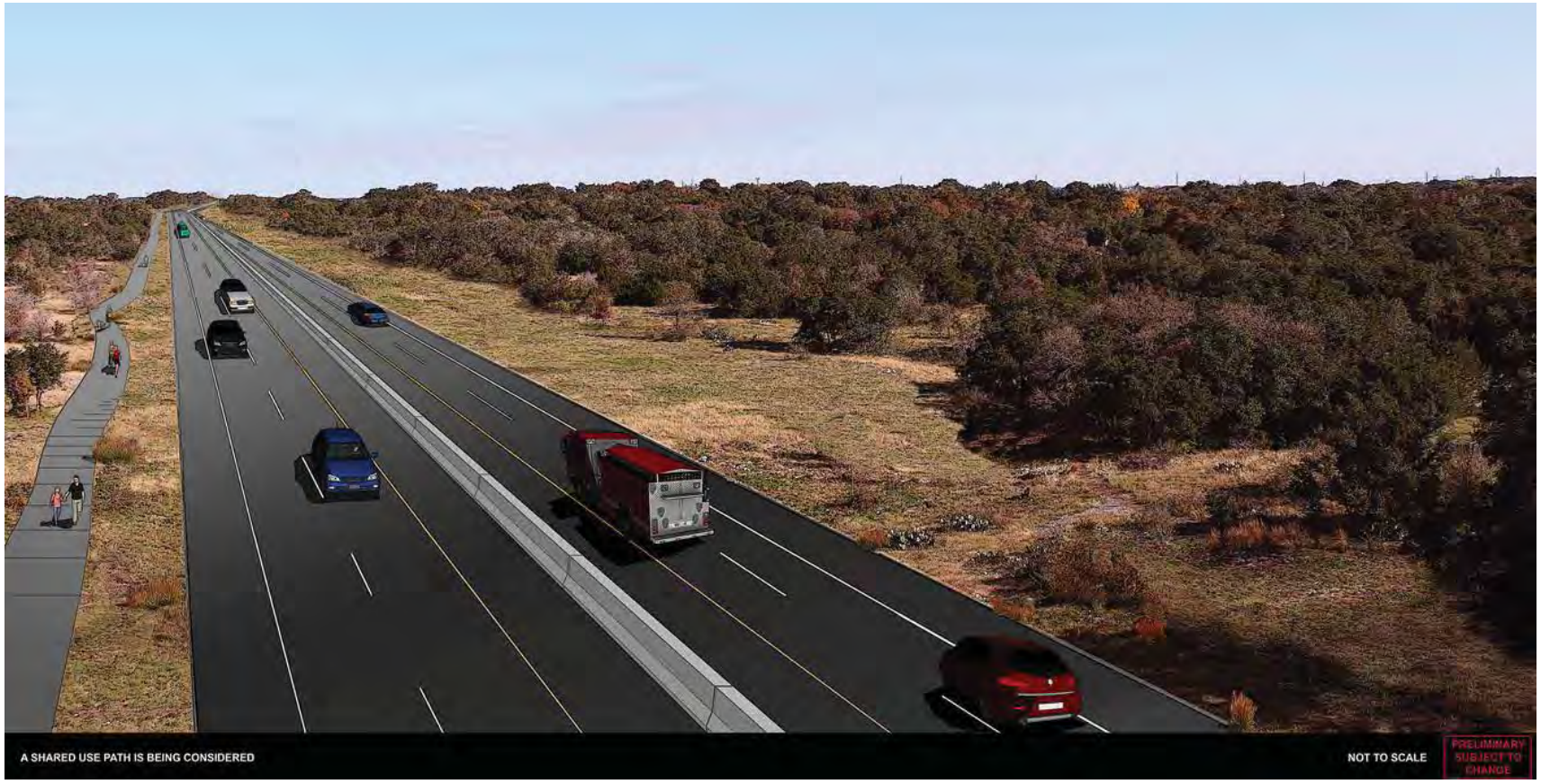
CONCEPTUAL RENDERING:

FM 1626 to Bear Creek

SH 45SW
ENVIRONMENTAL STUDY

CONCEPTUAL RENDERING:

Bear Creek to MoPac



SH 45SW
ENVIRONMENTAL STUDY

NEXT STEPS

- A Virtual Open House will be available through August 13, 2014 on the project website: www.sh45sw.com
- Comments received by August 13, 2014 will be included in the official public hearing record
- All comments will be documented, reviewed, and considered
- Final EIS will be prepared/reviewed
- An environmental decision on SH 45SW is anticipated in early 2015

SH 45 SW
ENVIRONMENTAL STUDY

SH 45 SW
ENVIRONMENTAL STUDY

Attachment D

Public Hearing Handout Materials

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

WELCOME

On behalf of the Texas Department of Transportation and the Central Texas Regional Mobility Authority, we want to welcome you to tonight's public hearing regarding the proposed construction of State Highway 45 Southwest (SH 45SW) in Travis and Hays counties.

An agenda for the hearing and information regarding the proposed project are attached for your information. This handout, as well as the exhibits shown at tonight's public hearing, is available on the project website at www.SH45SW.com as part of the ongoing Virtual Open House. The Virtual Open House will be available until the end of the official comment period (Wednesday, August 13, 2014) but all materials will be archived on the site for further review.

Please feel free to examine the exhibits on display tonight from 5 - 6 p.m. Project staff members will be available to answer questions. A technical presentation on the proposed improvements will begin at 6 p.m., followed by a brief recess and public comment session.

If you wish to make a verbal comment during the public comment portion of the hearing, please register to speak at the sign-in table before the end of the recess. Comments may also be presented in writing. For your convenience, a comment form is included in this information packet. Written comments not submitted during the hearing should be mailed to the TxDOT Austin District Environmental Coordinator, P.O. Box 15426, Austin, Texas 78761-5426, faxed to 512-832-7157, or submitted through the project website (www.SH45SW.com).

All verbal comments received at the public hearing, as well as written comments received by Wednesday, August 13, 2014, will be taken into consideration during future project development and will be included in the official public hearing record.

Thank you for attending tonight's public hearing. Public involvement is a vital part of TxDOT's project development process and we sincerely appreciate your participation.

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

AGENDA

PUBLIC HEARING

Bowie High School, 4103 W. Slaughter Ln., Austin, TX 78749

OPEN HOUSE *Begins at 5 p.m.*

- View exhibits on proposed project
- Review the Draft Environmental Impact Statement (EIS) and preferred alternative schematic
- Talk with project staff to learn more about the project and get your questions answered
- Submit your written comments using a comment form and/or verbally to the court reporter
- Fill out a speaker card if you wish to provide a public comment

PRESENTATIONS AND PUBLIC COMMENT *Begins at 6 p.m.*

TECHNICAL PRESENTATIONS

- Environmental
- Engineering and Design
- Right-of-way

BREAK

- Fill out and turn in a speaker card at the sign in table if you wish to present verbal comments during tonight's public hearing
- Get your questions answered by speaking to a member of the project team

PUBLIC COMMENT SESSION

- Speakers will be called in the order they signed up to speak
- To ensure that everyone who wants to make a comment this evening has an opportunity to do so, each speaker will be limited to 3 minutes and there is no transferring of time to others
- Please be sure to speak into the microphone and face the court reporter when you speak so that your comments can be accurately recorded
- Please begin any verbal comment by stating your name for the court reporter

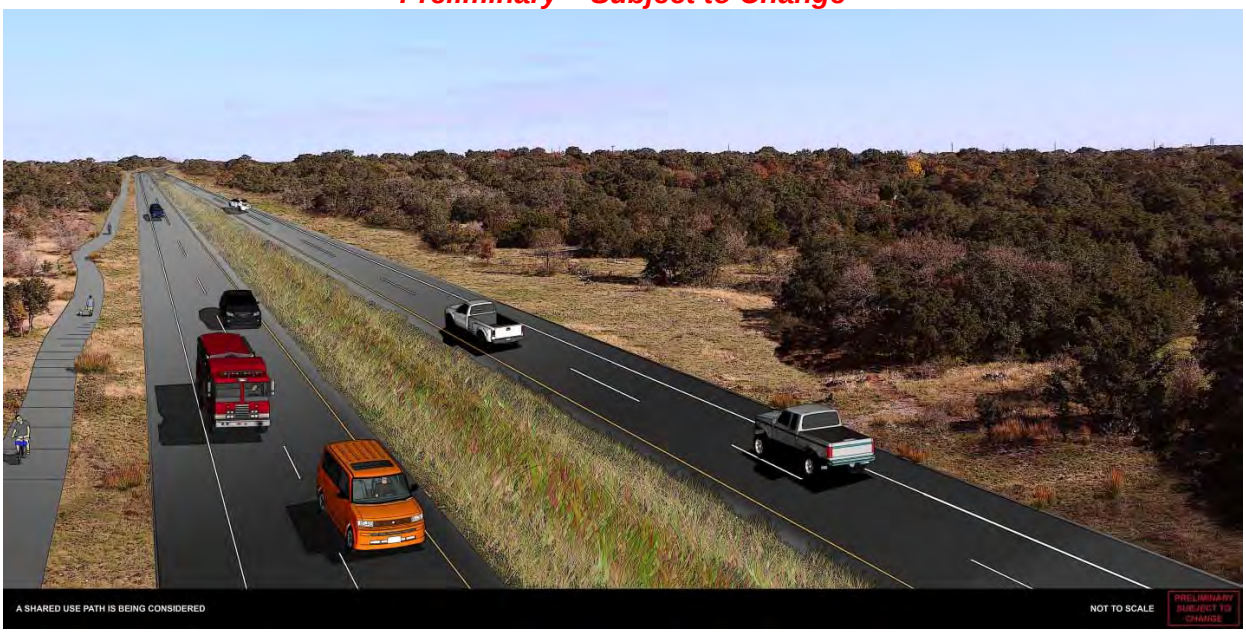
ADJOURN

Proceedings will conclude after the last registered speaker has been heard

PUBLIC HEARING - JULY 29, 2014

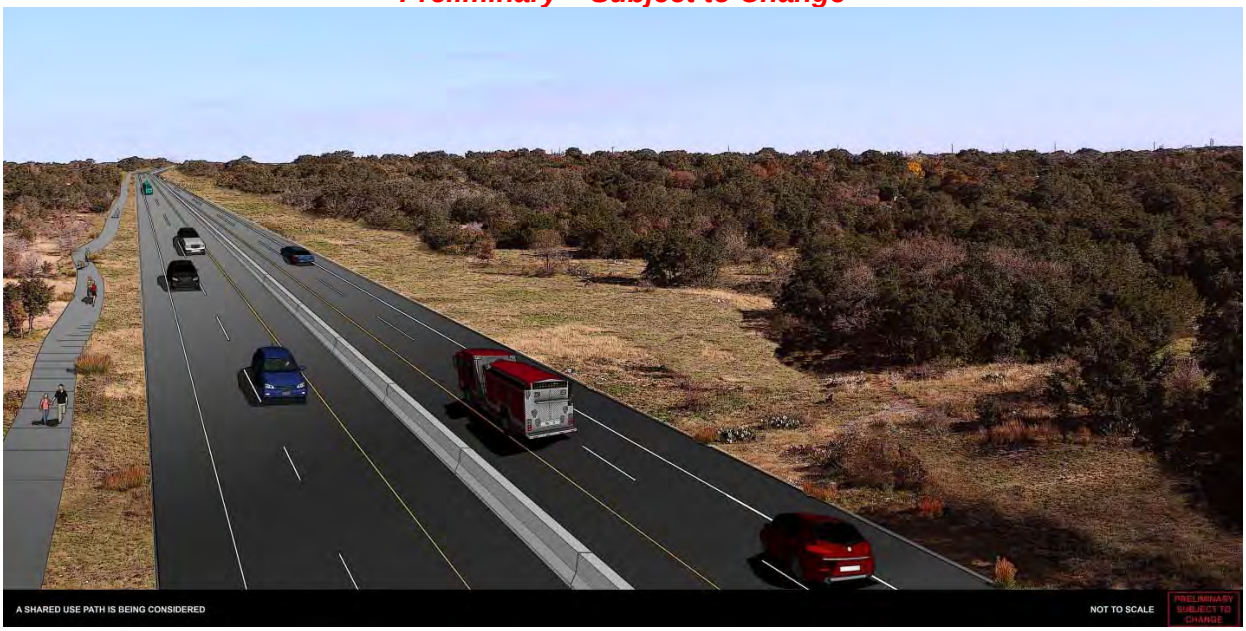
CONCEPTUAL RENDERINGS

Preliminary – Subject to Change



SH 45SW from FM 1626 to Bear Creek

Preliminary – Subject to Change



SH 45SW from Bear Creek to MoPac

RIGHT-OF-WAY

Right-of-Way Acquisition & Relocation Assistance

As SH 45SW is currently proposed, no additional right-of-way or displacement of residences or business is anticipated.

If it is determined that additional right-of-way had to be acquired, with the exception of donated properties, an appraisal would be completed to determine just compensation under the laws of the State of Texas. The determined value would then be offered to each property owner. Each property owner would be afforded the opportunity to accompany the appraiser(s) during the inspection of the property. In all cases, the property owner would be reimbursed for any reasonable, incidental expenses necessarily incurred in transferring title to the property for use by TxDOT. Expenses eligible for reimbursement generally include recording fees, closing costs and similar expenses incidental to conveying the real property to the State and penalty costs that are required for prepayment of any pre-existing recorded mortgage entered into in good faith encumbering the real property.

Relocations are not anticipated to be required as a part of the proposed project. However, if relocations become necessary, it is the policy of TxDOT that no family or individual would be required to relocate until adequate replacement housing has been made available to all affected persons. Further, replacement housing must be fair housing offered to all affected persons regardless of race, color, religion, sex or national origin. The information brochure Relocation Assistance is available at this public hearing at the sign in table. The brochure outlines the services offered and any payments for which displaced individuals, families, businesses and non-profit organizations may be eligible to receive, such as moving expenses and replacement housing payments for residential owners and tenants. The brochure also outlines the eligibility requirements for receiving these payments.

SH 45 SW

ENVIRONMENTAL STUDY

THE PROBLEM

200%

Population growth in northern Hays and southern Travis counties between 1990 and 2010.

85%

Expected population increase in the same area by 2035.

Rapid population growth in northern Hays and southern Travis counties has increased congestion in the area. As a result of growth and development, drivers turned to use of local roads as commuter corridors, increasing congestion. Signalized intersections on local roads exacerbate the traffic problem and some neighbors have expressed concerns about cut-through traffic, as well as the inability to safely exit their neighborhoods. Motorists need improved system connectivity and an efficient alternate route to congested local roadways.

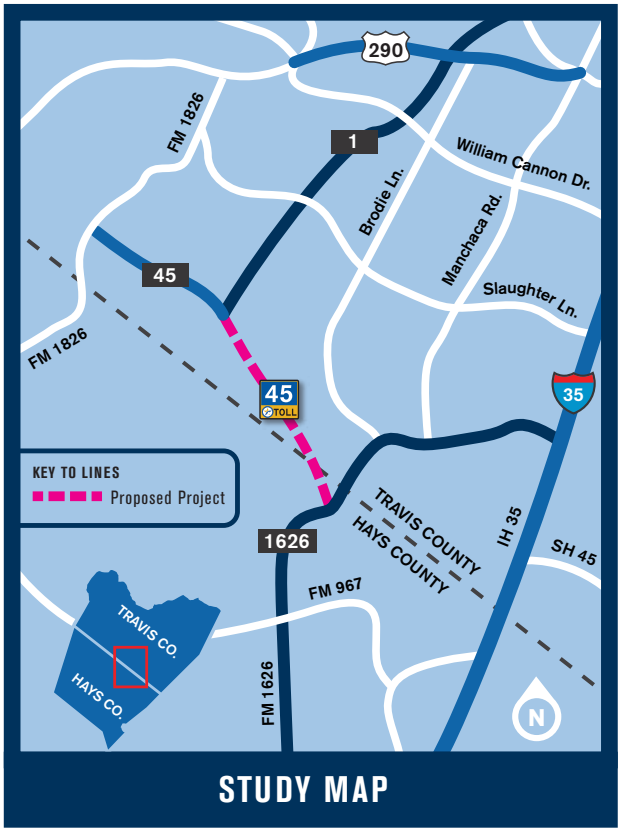
THE PROCESS

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority), along with multiple participating agencies, are in the process of evaluating the environmental, social and economic impacts potentially resulting from the proposed construction of State Highway 45 Southwest (SH 45SW).

The SH 45SW environmental study was launched in June 2013. Initial stakeholder outreach and alternatives analysis in fall 2013 resulted in the development of a draft environmental document, released in June 2014.

Texas Department of Transportation

CENTRAL TEXAS Regional Mobility Authority



STUDY MAP

RECOMMENDED SOLUTION

The proposed SH 45SW project has been identified as a possible solution for improving mobility in this rapidly growing area. SH 45SW would be a limited access, four-lane divided toll road, proposed for construction between Loop 1 (MoPac) and FM 1626 on existing state-owned right-of-way.

This was identified as the preferred alternative because it:

- Meets the Purpose and Need
- Would not directly impact city of Austin Water Quality Protection Lands
- Avoids relocations or displacements by staying within existing right-of-way
- Minimizes cost and impacts to existing neighborhoods
- Is consistent with regional plans

The preferred alternative would consist of:

- Four 12-foot travel lanes (two in each direction)
- A 10-foot outside shoulder
- A four-foot inside shoulder
- A 10-foot shared use path for bicyclists and pedestrians

CONCEPTUAL RENDERING OF THE PROPOSED SH 45SW

PLANNED WATER QUALITY PROTECTION MEASURES

If constructed, SH 45SW would be over the Recharge Zone and Transition Zone of the Barton Springs segment of the Edwards Aquifer. During construction, water quality management would include:

- Early installation of permanent water quality features
- Filtering construction runoff
- Prevention of natural drainage from outside the right-of-way from mixing with construction runoff prior to treatment
- Construction oversight by an independent, on-sight environmental compliance manager

After construction, water quality would be protected through the use of permanent Best Management Practices (BMPs) - developed with input from multiple state and local agencies including the city of Austin, Travis County and the Barton Springs/Edwards Aquifer Conservation District. These BMPs would include:

- Permeable Friction Course (PFC) pavement
- Water quality ponds/hazardous materials traps
- Vegetative filter strips
- Grassy swales

IMPACT OF PLANNED WATER QUALITY PROTECTION MEASURES

Texas Commission on Environmental Quality rules for the Edwards Aquifer requires the removal of 80% of the increase in Total Suspended Solids (TSS) from new development to ensure non-degradation of water quality.

- Planned SH 45SW water quality protection measures would remove at least 90% of the TSS load generated over the Recharge Zone
- With the Build Alternative's water quality protection measures, sediment in runoff from the project area would be reduced

LEARN MORE, PROVIDE INPUT AND GET INVOLVED

The draft Environmental Impact Statement (EIS) is available for public review and input. After input from this public hearing and official comment period is reviewed and analyzed, the Draft EIS can be finalized.

- Visit www.SH45SW.com
- Sign up for email updates online
- Submit your comments and questions
- Invite the project team to meet with your neighborhood or community group

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): _____

Comment:

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

This form may be used to provide written comments on this project. Any questions placed on this form will not be considered an open records request and will not be treated as such. If you have an open records request, it must be submitted under a separate letter.

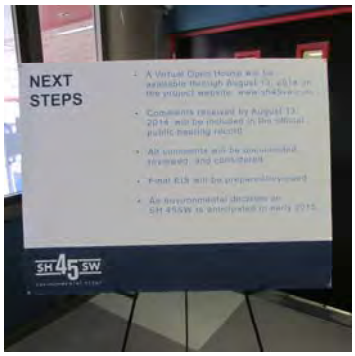
(Texas Transportation Code, §201.811(a)(5). Check each of the following boxes that may apply to you:
□ I am employed by TxDOT
□ I do business with TxDOT
□ I could benefit monetarily from the project or other item about which I am commenting on

SH 45 SW
ENVIRONMENTAL STUDY

Attachment E

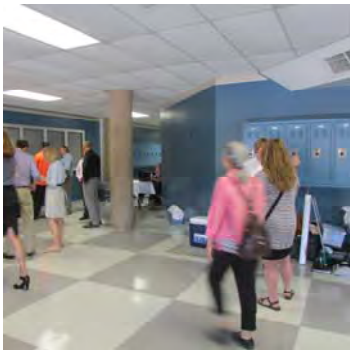
Public Hearing Photographs

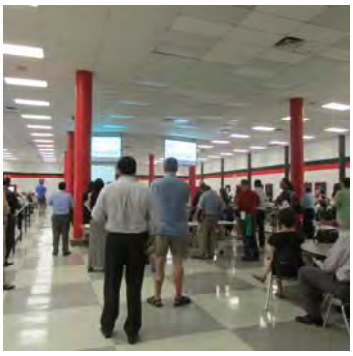
SH 45SW Public Hearing
July 29, 2014



WRITTEN
COMMENTS

Human
Environment
SH 45 SW





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Attachment F

Public Hearing Sign-In Sheets

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	Marcus Whitfield	78652
	Sandra Liberman	78610
✓	Todd Ruge	78610
	Cynthia Fish	78748
	Ricardo Zamarripa	78739
	Sidney Mc[illegible]	78735
	Kristen Plogger	78652
	Madison Williams	78752
✓	Bob Larsen	78747

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	TD Bryan	78739
	J. Gutierrez	78735
	[illegible]	
	Lois [illegible]	
	Ed [illegible]	78739
	[illegible] - Owen	78735
✓	Chris Riley	78701

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	GONZALO CAMACHO	78751
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	Stephanie Messerli	78739
	Brian Regan	78739
	KEVIN TOMASEK	78739
✓	Craig Smith	78704

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NO	PAUL KARDO	28737
	Bob Leahey	78746
Yes	Larry Odom	78610
No	DAVID Richardson	
NO	ROY WALEY	78757
NO	KAREN LEMMON	78745
NO	JASON DENNY	78748

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	Leonard Vallingolo	78736
	Ron Pope	78739
	Rob Gorr	78739
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	Leanne Cantalupo	78619
	STEVEN Wawrowski	78739
	DAVID Sellstrom	78610
	~~MIKE BRUMLEVE~~	78748
X	Sheryl Cole	
	Colleen Garland	78749

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	Kristi Powell	78652
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	Will Herring	78[illegible]
	DJ Cardamone	78748

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	Darryl Pruett	78749

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	Jimmy Robertson	78703
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		78652
	Bonnie Lister	78752
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	FRED BIBO	78739
	AL STEWART	36
	Amy Bishop	78757

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	Katie Moore	78610
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	Charles Gallatin	78652
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	Keith Cantrell	78739

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	Eric Davis	78739
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	Marisabel Randhurs	

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	Thomas Machen	78737

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	[illegible]	78748
	John [illegible]	78737
	[illegible]	78739
	[illegible]	78749
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	ROY TOONE	78749

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	SCOTT DUKETTE	78735
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	Alfredo Reza	78652
	Michelle Ramage-Chu	78640
	Doug Ross	78739
	ROD RUDER	78739
	Lindsey Kimmitt	78749
	Jeff Usakewicz	78610
	ARNIE SCHAFFER	78739

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	ALVIN BATES	78748
	MARION BATES	✓ ✓
	Renee Mauzy	78610
	Julie Mykne	78739
	Barbara Robin	78739
	HARVEY DAVIS	78610
	Mike Rodriguez	78747

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	CAMERON STAFF	78748
	Tricia Bruck	78749
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	~~Bob Bates~~	~~78737~~
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	Abby Tomlinson	78759
	Heather Gouraig	78749
	Yasmin Wagner	78739
	Jeri McQueen	78748

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	Buck Baccus	78676
	MARK SMITH	78701
	IL AN	78739
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	Mike Boblick	78610

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	Bob Diederich	78748
	Alan Fish	78748
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	Kevin Hoffman	78731

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	Rafael Tinajero	78749
	E. Hallbrech	78735
	Joyce Shierlow	78652
	Michael Eichelmann	78739
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	Don Nyland	78652
	Barbara Rodgers	78749
	Laurie Gunderson	78739
	Alex Droplan	78705
	Steve Manilla	~~78734~~
	MARY KELLY-DILLON	78610
	JAN DeCABOOTER	78748
	GARY IGNAL	78739

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	Charlotte Gilpin	78749
	Craig Nazor	78758
	CRAIG CANNON	78739

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	Leonette Toone	78749
	Pete Geeslers	78739
	Courtney Williamson	78652
	Jill Duarte Support 5TH45	78748
	Gary McGill	78737
	Julian Summers	78732
	Jim Mann	78748
	Adam Krutsinger	78748

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	John Wilson	78739
	Chuck Lesniak	78660
	———	78748
	DAVID SIEFSEMA	78737
	Karl Nodine	78739
	James Brown	78739
	Andrea Exter	78739
	JIM FOWLER	78735

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	Sridhar Hariharan	78748
	Carolyn Blackwood	78739
	Anita Faber	78748
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	Alan Albers	78148
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	Bob Jordan	
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	Christie Westerman	78249
	MARK HEY	78249
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	Brian Watson	78739
	BYRON FRENCH	78735
	Chris Herrington	78704
	Barb Siegwalt	78737
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	Richard Mason	78739
	Matt Morehead	78737
	Belle Fulton	78748
	Lynne Andrus, PhD	78748
	Allen Barr	78748

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	Olivia Harris	78739
	David A. Jensen	78610
	Ellen Troxclair	78749
	Dan Buck	78745
	Ian Atwater	78737
	Robert T. Everett	78748
	Todd Shelton	78748
	Brent Looby	78748
	ELIZABETH A KORTS	78748

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	James Moseley	78739
	David Williams	78723
	Rafael Rcojas	78749
	Karla Taylor	78704
—	Mike McNamara	78254
	Elaine Leatherwood	78748
	Robert CORBIN	78704
	Will Atkins	78736
	Gary Schmelter	78748

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	Jack + Rosalie Davis	78748
	JAIME D GÓMEZ	78652
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	Kim Amaro-Saldaña	78652
	Richard DePalma	78739
	John Hall	78748
	Cyndy Stoval Gat	78610
	TRICIA MOSIER	78681
	Ray Umscheid	78723

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	ROBERT EWEN	78749
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	Greg Kaufmann	78610
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	Susan Eng	78739
	Jeb Bayt	78756
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	Mara Garcia	78739
	Edward Robinson	78748
	DAN JASINSKI	78749
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	Zia Lyle	78749
	Theresa Reed	78739
	JAMES WICK	78745
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	Mary Ann Neely	78704
	Russell Coplen	78640
	Mark Weir	78748
	TRAVIS FLAKE	78610
	Bill ALESHIRE	78739
	Joe Dale	78748
	Lua Lisa Williams	78739
	Stephen Beers	78745

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	Will Herwig	78739
	Wally Reeves	78739
	Sheila Hancock	78610
	Ann Schlotter	78619
	Reinold Von Fange	78610
	David Duncan	78610
	~~Morgan~~	
	Joe Labriola	78748
	Mitch Gouldin Q	News 8

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	Mark Hollis	78749
	Mary Bailey	78610

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Kelli Rupnik	TxDOT
Chris Bishop	TxDOT
Ed Collins	TxDOT
Kris Keith	HNTB
Bruce Byrum	TxDOT
Andy Martin	Mobility Authority
James R Williams	TxDOT
Kenny Neely	NLA
~~Alfonso Sexton~~ Julia Jerome	TxDOT

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Kara Buttington	Gap Strategies
Liza Ross	NLA
Portia Osborne	Blanton + Associates
Elizabeth Story	HNTB
Jessica Salaza	HNTB
Lauren Arioli	CPSJ
Doug Booher	TxDOT
Kemble White	Cambrian Environmental
Walt Meitzen	CMtC

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Dean Tesmer	Blanton & Associates, Inc.
Wade Strong	RTG
Lucas Short	TxDoT
Melissa Hurst	Mobility Authority
Bonnie Doggett	CP&Y, Inc.
Mike Walker	TxDOT
Lynda R.S	RiSeline
Kim JOHNSON	BLANTON & ASSOC.
Thomas Krawitz	TxDot

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Carlos Swonke	TxDOT
Dwayne Halbardier	Tx DOT
Heather Beatty	TXDOT
Jodi Bechtel	TxDOT
Craig Hebbe	RTG
Sara Morgenroth	Rifeline
Sonya Hernandez	TxDOT
Andy Blair	TxDOT
MICHAEL CHAVEZ	TxDOT

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LANCE PELTIER	RTG
ERIC HOLSTEN	HNTB/CTRMA
CRISPIN RUIZ	G5RJW
RICK L'AMIE	CTRMA
Jay Bullock	TxDOT
JEFFREY R. GILL	TXDOT
MARC WILLIAMS	TxDOT
Mario Espinoza	Central Texas Regional Mobility Authority
Heather Ashley Nguyen	TxDOT

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Attachment G

Virtual Open House Information

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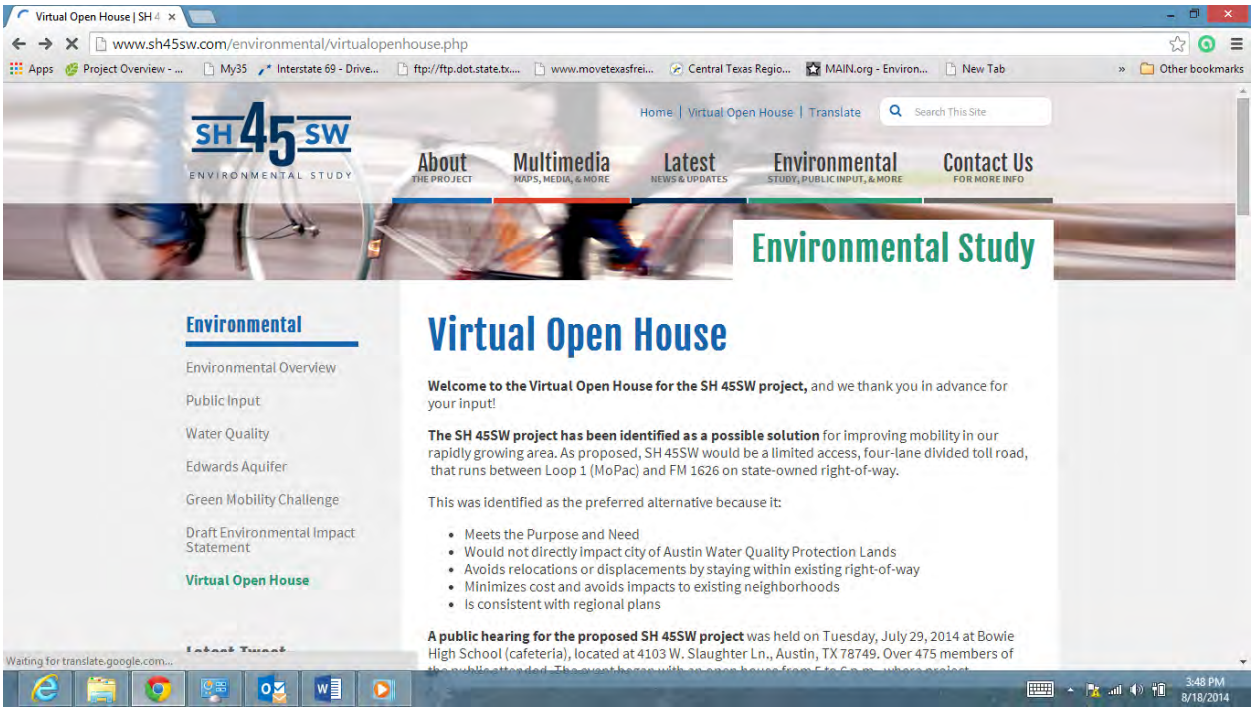
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Public Input
Water Quality
Edwards Aquifer
Green Mobility Challenge
Draft Environmental Impact Statement
Virtual Open House
Virtual Open House
Welcome to the Virtual Open House for the SH 45SW project, and we thank you in advance for your input!
The SH 45SW project has been identified as a possible solution for improving mobility in our rapidly growing area. As proposed, SH 45SW would be a limited access, four-lane divided toll road, that runs between Loop 1 (MoPac) and FM 1626 on state-owned right-of-way.
This was identified as the preferred alternative because it:
Meets the Purpose and Need
Would not directly impact city of Austin Water Quality Protection Lands
Avoids relocations or displacements by staying within existing right-of-way
Minimizes cost and avoids impacts to existing neighborhoods
Is consistent with regional plans
A public hearing for the proposed SH 45SW project was held on Tuesday, July 29, 2014 at Bowie High School (cafeteria), located at 4103 W. Slaughter Ln., Austin, TX 78749. Over 475 members of
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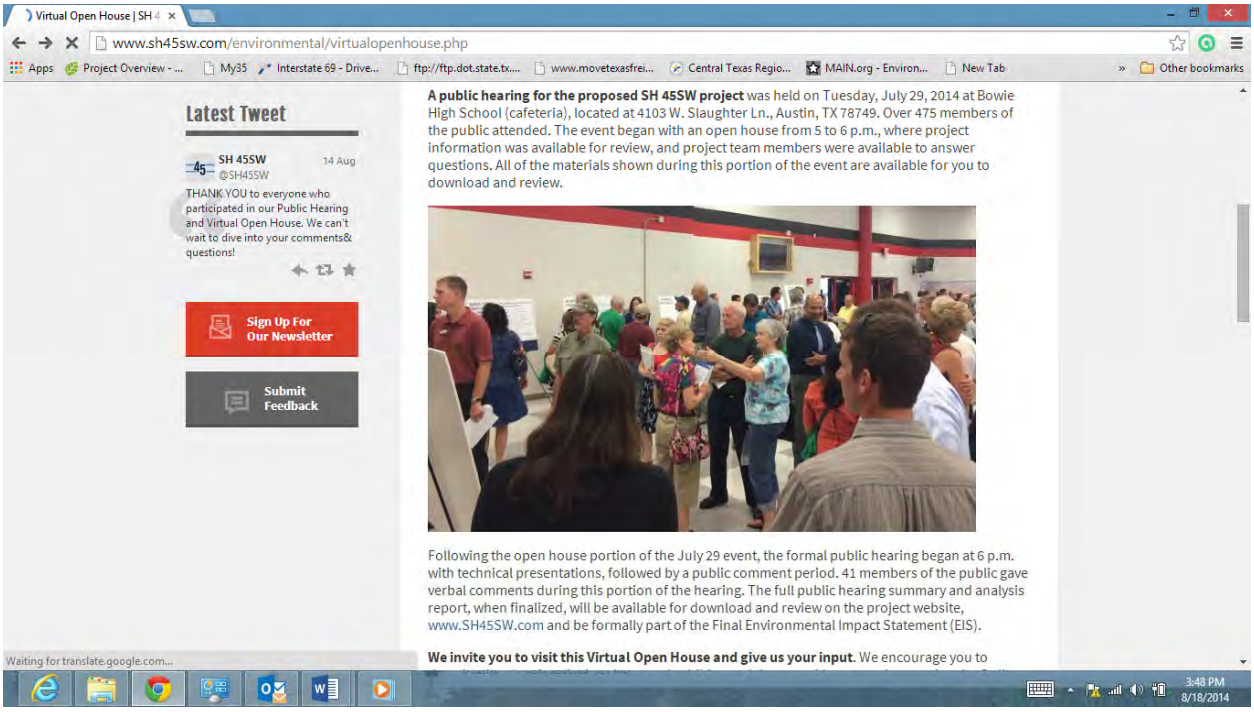
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THANK YOU to everyone who participated in our Public Hearing and Virtual Open House. We can't wait to dive into your comments& questions!
Sign Up For Our Newsletter
Submit Feedback
A public hearing for the proposed SH 45SW project was held on Tuesday, July 29, 2014 at Bowie High School (cafeteria), located at 4103 W. Slaughter Ln., Austin, TX 78749. Over 475 members of the public attended. The event began with an open house from 5 to 6 p.m., where project information was available for review, and project team members were available to answer questions. All of the materials shown during this portion of the event are available for you to download and review.
Following the open house portion of the July 29 event, the formal public hearing began at 6 p.m. with technical presentations, followed by a public comment period. 41 members of the public gave verbal comments during this portion of the hearing. The full public hearing summary and analysis report, when finalized, will be available for download and review on the project website, www.SH45SW.com and be formally part of the Final Environmental Impact Statement (EIS).
We invite you to visit this Virtual Open House and give us your input. We encourage you to
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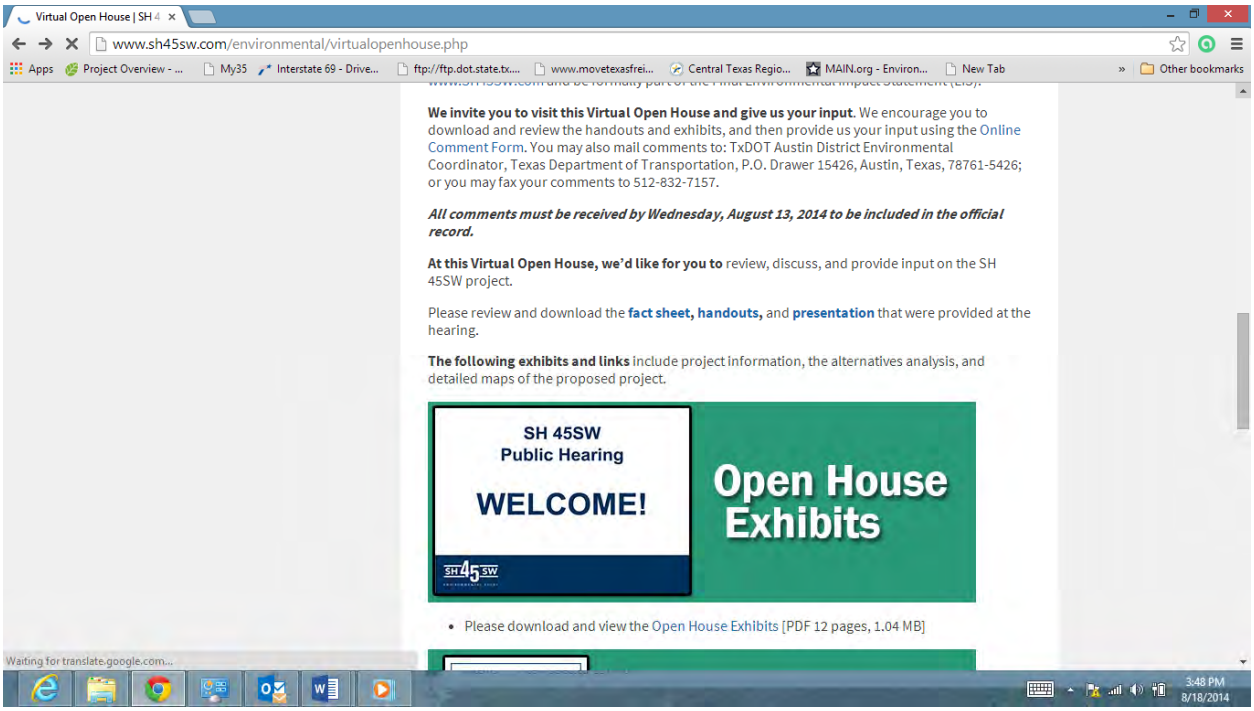
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We invite you to visit this Virtual Open House and give us your input. We encourage you to download and review the handouts and exhibits, and then provide us your input using the Online Comment Form. You may also mail comments to: TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426; or you may fax your comments to 512-832-7157.
All comments must be received by Wednesday, August 13, 2014 to be included in the official record.
At this Virtual Open House, we'd like for you to review, discuss, and provide input on the SH 45SW project.
Please review and download the fact sheet, handouts, and presentation that were provided at the hearing.
The following exhibits and links include project information, the alternatives analysis, and detailed maps of the proposed project.
SH 45SW
Public Hearing
WELCOME!
Open House Exhibits
Please download and view the Open House Exhibits [PDF 12 pages, 1.04 MB]
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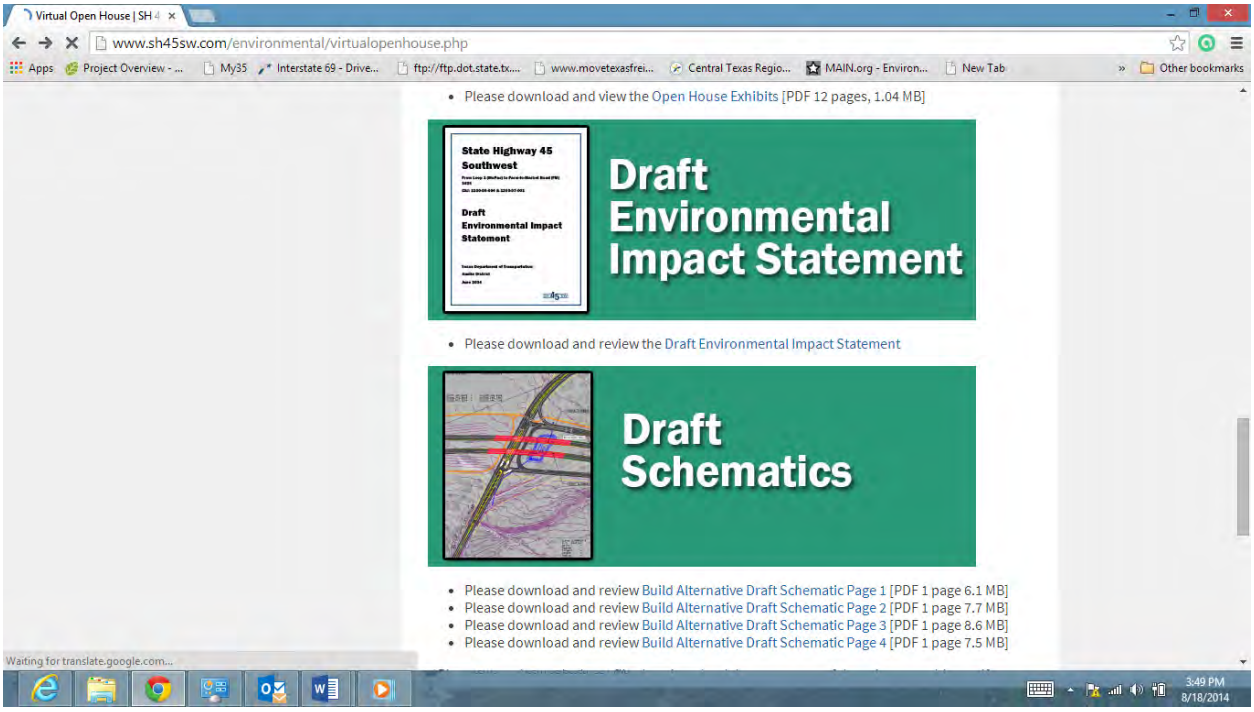
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State Highway 45 Southwest
Draft Environmental Impact Statement
Draft Environmental Impact Statement
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Draft Schematics
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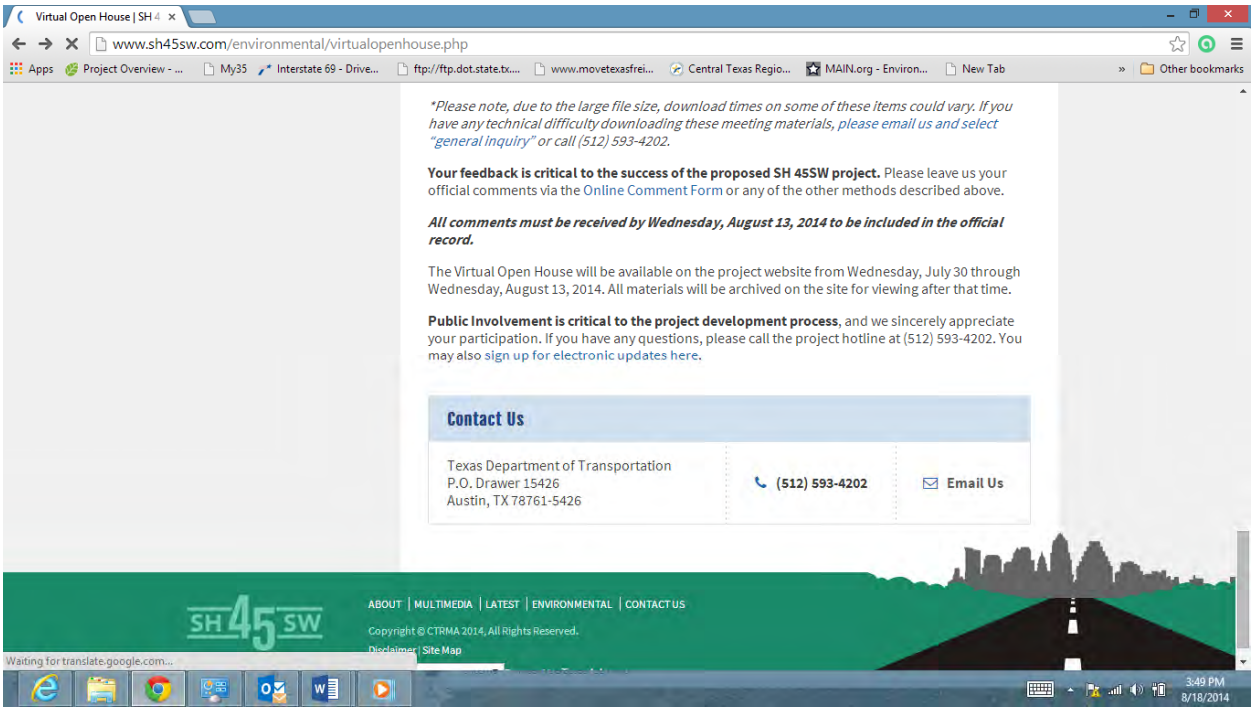
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*Please note, due to the large file size, download times on some of these items could vary. If you have any technical difficulty downloading these meeting materials, please email us and select "general inquiry" or call (512) 593-4202.
Your feedback is critical to the success of the proposed SH 45SW project. Please leave us your official comments via the Online Comment Form or any of the other methods described above.
All comments must be received by Wednesday, August 13, 2014 to be included in the official record.
The Virtual Open House will be available on the project website from Wednesday, July 30 through Wednesday, August 13, 2014. All materials will be archived on the site for viewing after that time.
Public Involvement is critical to the project development process, and we sincerely appreciate your participation. If you have any questions, please call the project hotline at (512) 593-4202. You may also sign up for electronic updates here.
Contact Us
Texas Department of Transportation
P.O. Drawer 15426
Austin, TX 78761-5426
(512) 593-4202
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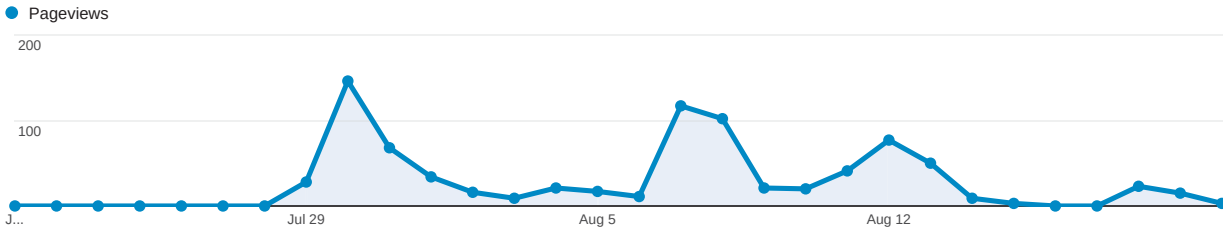

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			831 % of Total: 9.91% (8,382)	515 % of Total: 8.46% (6,089)	00:02:07 Site Avg: 00:01:39 (27.97%)	339 % of Total: 11.08% (3,059)	48.97% Site Avg: 40.50% (20.90%)	38.27% Site Avg: 36.49% (4.86%)	$0.00 % of Total: 0.00% ($0.00)
1.	/environmental/virtualopenhouse.php	(direct) / (none)	**318** (38.27%)	209 (40.58%)	00:01:57	154 (45.43%)	61.69%	45.91%	$0.00 (0.00%)
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3.	/environmental/virtualopenhouse.php	t.co / referral	**127** (15.28%)	88 (17.09%)	00:02:08	79 (23.30%)	32.91%	33.07%	$0.00 (0.00%)
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5.	/environmental/virtualopenhouse.php	bing / organic	**29** (3.49%)	14 (2.72%)	00:02:31	2 (0.59%)	50.00%	34.48%	$0.00 (0.00%)
6.	/environmental/virtualopenhouse.php	us2.campaign-archive1.com / referral	**28** (3.37%)	13 (2.52%)	00:04:33	10 (2.95%)	40.00%	25.00%	$0.00 (0.00%)
7.	/environmental/virtualopenhouse.php	mobilityauthority.com / referral	**24** (2.89%)	11 (2.14%)	00:01:55	1 (0.29%)	0.00%	16.67%	$0.00 (0.00%)
8.	/environmental/virtualopenhouse.php	txdot.gov / referral	**23** (2.77%)	12 (2.33%)	00:01:50	3 (0.88%)	33.33%	34.78%	$0.00 (0.00%)
9.	/environmental/virtualopenhouse.php	facebook.com / referral	**21** (2.53%)	18 (3.50%)	00:00:39	16 (4.72%)	56.25%	57.14%	$0.00 (0.00%)
10.	/environmental/virtualopenhouse.php	l.facebook.com / referral	**15** (1.81%)	10 (1.94%)	00:00:40	8 (2.36%)	25.00%	33.33%	$0.00 (0.00%)
11.	/environmental/virtualopenhouse.php	m.facebook.com / referral	**14** (1.68%)	12 (2.33%)	00:00:53	12 (3.54%)	58.33%	57.14%	$0.00 (0.00%)
12.	/environmental/virtualopenhouse.php	edit-content.com / referral	**10** (1.20%)	7 (1.36%)	00:04:42	1 (0.29%)	100.00%	60.00%	$0.00 (0.00%)
13.	/environmental/virtualopenhouse.php	search.freefind.com / referral	**6** (0.72%)	2 (0.39%)	00:05:33	0 (0.00%)	0.00%	33.33%	$0.00 (0.00%)
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	17. /environmental/virtualopenhouse.php	us2.campaign-archive2.com / referral	**4 (0.48%)**	3 (0.58%)	00:00:08	3 (0.88%)	66.67%	75.00%	$0.00 (0.00%)
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	21. /environmental/virtualopenhouse.php	sh45sw.us2.list-manage1.com / referral	**3 (0.36%)**	2 (0.39%)	00:00:37	2 (0.59%)	0.00%	33.33%	$0.00 (0.00%)
	22. /environmental/virtualopenhouse.php	crossroads / referral	**2 (0.24%)**	1 (0.19%)	00:02:08	1 (0.29%)	0.00%	50.00%	$0.00 (0.00%)
	23. /environmental/virtualopenhouse.php	editor.wix.com / referral	**2 (0.24%)**	1 (0.19%)	00:02:25	0 (0.00%)	0.00%	50.00%	$0.00 (0.00%)
	24. /environmental/virtualopenhouse.php	lm.facebook.com / referral	**2 (0.24%)**	2 (0.39%)	00:00:25	2 (0.59%)	0.00%	0.00%	$0.00 (0.00%)
	25. /environmental/virtualopenhouse.php	yahoo / organic	**2 (0.24%)**	1 (0.19%)	00:02:22	0 (0.00%)	0.00%	50.00%	$0.00 (0.00%)

Rows 1 - 25 of 35

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SH 45 SW
ENVIRONMENTAL STUDY

Attachment H

Written Comments Received

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Comment Forms

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): ALAN ALBERS

Comment:

1. BRODIE IS A NEIGHBORHOOD ST; NOT BUILT FOR THE AMOUNT OF TRAFFIC IT SERVES TODAY -

2. NEW SH45SW CAN BE BUILT TO PROTECT ENVIRONMENT!

3 GROWTH IN HAYS COUNTY IS CONTINUING AND AUSTIN CAN'T STOP IT AND NEEDS THOSE COMMUTERS TO WORK IN AUSTIN.

4 SW HAYS + TRAVIS COUNTY NEEDS A N/S HWY TO ACCESS COMMUTERS, NOT A NEIGHBORHOOD CUT-THROUGH!!!

5. BUILD SH45 SW NOW!! WE'VE WAITED LONG ENOUGH!

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Mr. IL AN

Comment: I live next to S. Mopac, south of Slaughter Ln. The traffic on S. Mopac during rush hours in the morning & evening is already crawling. If you have to connect 1626 with S. Mopac & 45, then you mus build either over passes or under passes at Slaughter Ln. & La Crosse Ave. BEFORE you connect 1626 to S. Mopac. All traffics that are rerouted to S. Mopac will just move same traffic problem from Brodie Ln to S. Mopac. The traffic noise is bad now and will get worse. We need have walls built next to our backyard fences to deaden the noise. So we can sleep soundly during night. Without it our property value will decrease significantly.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Lynne C. Andrus, RN, PhD

Comment:

Our area's former County Commissioner (Huber) was often quoted as stating that SH 45 SW would save, at most, only a few minutes of commute (and, I assume, exhaust) time. What she and many others fail to understand or acknowledge is that a few minutes (or even a single minute) can be life-saving. I watched EMS vehicles stalled on Brodie at rush hour. As a Call Triage RN, I have been on the phone with a mother trying to keep her asthmatic child alive while waiting for EMS stuck in traffic.

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None

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Pamela Arceneaux

Comment: Very Interesting Presentation

Truely hope to see I 45 extension built.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): Angela ARMITAGE

Comment:

(1) There was no mention during the presentation of the anticipated traffic impact on RM 1826 between the existing terminus of I-45 at 1826 and 290. (Since ~~my home is very close to 1826~~ the development "Estates of Loma Vista" is adjacent to 1826 and my house on Twilight Mesa Drive has 1826 as its only entry/exit point, the anticipated additional traffic is of great concern to many ~~people~~ of our neighbors as well.

(2) Regarding the "shared use path" discussed by Lupe Short; has a plan been made for ~~the~~ car parking ~~where~~ where ~~stop~~ pedestrians + bicyclists can leave their vehicle while using the pathway?

(3) I am concerned about the idea of proposed reconstruction of the not-yet completed 1626. Can't it be constructed to comply with the anticipated design of SH45SW?

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Thank you.

JULY 29, 2014 – PUBLIC HEARING

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): ALVIN BATOS

Comment: BUILD THE "D" ROAD!
IT IS TOO LONG GETTING DONE.

DO SOMETHING FOR THE SOUTH, NOT JUST FOR CENTRAL, EAST & NORTH AUSTIN!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Rob Baxter Pres. Friendship Alliance

Comment: SW45 EIS Draft should be withdrawn. Do it right!
Why have you not looked at Improving Wyldwood to Mopac from Bradic as a solution for Shady Hollow?

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JULY 29, 2014 – PUBLIC HEARING

APR-11-2004 09:25A FROM:POCKET CONSOLE 512-858-5058 TO:15128327157 P.1

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): CYNTHIA BLACK

Comment: NO WAY should Mopac be open until Current traffic is reduced. Their are too many on ramp access for the Road.
Toll Roads on MoPac are a Joke. IF you Could add lanes for toll then they should have been expanded in the first Place.
Bad decision to add 45 from Hayes when MoPac & Slaughter are already a Parking Lot. TxDOT Please go to Wilmot & Buy a fresnel & see the affect of a lot in a little space

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

[redacted]

Name (please print): Mike Boblick

Comment: I'm in favor of this road being built. Its something that should have been done twenty years ago. Question — With all the money set aside for this project — Why does this four mile have to be TOLL 2 Question To whom does this TOLL go to and what will it be used for?

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Anthony Buonodono

Comment: I support SH 45 SW

Please keep the project moving!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Bryce Burton

Comment: Brodie Lane was not intended to be a major throughfare. Hays County needs a bypass from FM 1626 to MoPac, that does not require taking too much of your commute. I feel the project can affect everyone along the southern part of Brodie, and could lighten traffic greatly.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Bob Caldwell

Comment:

Long overdue. Get 'er done!
Money no object. Enviroment important but reasonable precautions can be taken to mitigate.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): CRAIG CANNON

Comment: WHAT IMPROVEMENTS ARE PLANNED FOR THE INCREASED TRAFFIC AT
1. MOPAC / ESCARPMENT
2. MOPAC / LA CROSSE
3. MOPAC / SLAUGHTER

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): DJ Cardamone

Comment:

I am writing to urge you to move forward with SH45SW! I have been a residence in Shady Hollow for nearly 10 yrs. We bought our house with the understanding that SH45SW would be built. This road has been promised to our community for nearly 30 yrs now. I appricate that TxDot is going above and beyound by providing these public hearings but enough talk, it is time to move forward with this road. I understand those opposing this road want to build rail instead. However, it does not make sense to me to have a discussion regarding rail until we have our basic mobility infrostructer in place! then if it is justified after finishing our basic infrostructer, then we can discuss rail. Also, in 2012, 5 → over

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JULY 29, 2014 – PUBLIC HEARING

different housing developements were approved. the largest one, which is nearly 400 homes, would be right in the middle of SH45SW. If 5 housing developments can be approved all on sensitive land in 2012 then it is appropriate that we can build our road that has been promised to us for the last 30 yrs. It does not make sense to widen brodie as you would still need to keep the stop lights. Children cross that road to go to school. Shady Hollow is a neighborhood not a freeway. People are not going to skip Brodie Lane to drive all the way to Mancha to get to 35 or back track on 1626. they just won't! You would have to close Brodie to 1626 which was closed in the past. It was opened with the promise of the building of SH45SW.

this road is needed by our community, for those living in Shady Hollow and Circle C but also Hays County. We all need to get where we need to go. This road will allow that for our neighborhood and joining communities.

I know we can build this road responsibly to protect our environment. It is time for city officals to yeild to the magority who want this road. We have voted in favor of building this road for yrs! Comm. Doughtry was voted in just recently because he was such a strong advocate of building this road. It is time to listen to the magority.

Please let us move forward with the building of SH45SW!

Sincerely,

DJ Cadar

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Bill Chambers

Comment:

Please Build this, We are in great need of the mgor improvement

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): JOHN & ANGELA DOPPIGAN

Comment:

we are both very pleased with this project. We recently bought a house in Buda in Whispering Hollow. We have been there for 10 months & have seen an increase in traffic. I drive to Travis Co. Jail 3-4 days a week & am looking very forward to not having to take I35. We frequently use FM 1626 & have 20 family members that live in Austin. Thank you very much for all of the work that went into this project.

Angela Doppigan

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JULY 29, 2014 – PUBLIC HEARING

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COMMENT FORM

Name (please print): MASON Dillard

Comment:

Without clean water we wont even be able to use this highway. There are better alternatives than destroying the enviroment this shouldn't even be an argument/debate. Instead of compensating for more people that are expected or believed to move into Austin, perhaps if we made it less convient to commute people would stop moving here or even move back home where they came from. We're only accounting for the pollution created by making the highway, not considering the reoccurring amount of pollution that will come from the vehicles commuting on the road every day. The focus is not on sustainability, its on convience. If we don't focus on the preservation of Earth for the future we will have no future here. I think this needs alittle more thought pertaining to the future after the construction. Blessings & Love. Hopefully this works out for the best for all involved. God willing.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): SCOTT DUKETTE 78735

Comment:

SUPPORTIVE OF BUILDING THIS PROJECT AS SOON AS POSSIBLE. CURRENT SITUATION HAS NEGATIVE AIR QUALITY AND QUALITY OF LIFE IMPACTS.

BUILD IT NOW!

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COMMENT FORM

Name (please print): DAVID DUNCAN

Comment:

SH 45 SW SHOULD BE BUILT BECAUSE:

- THE VOTERS HAVE APPROVED IT
- THE ENVIRONMENTAL STUDIES SUPPORT IT
- IT WILL RELIEVE TRAFFIC IN ~~SH~~ SHADY HOLLOW
- IT WILL RELIEVE TRAFFIC GENERALLY ON BEDDIE AND MANCHACA, AND
- IT WILL BE AN OPTION FOR DRIVERS - IT'S NOT A TOTAL SOLUTION BUT NO A VIABLE ALTERNATIVES SHOULD BE IGNORED.

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JULY 29, 2014 – PUBLIC HEARING

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COMMENT FORM

Name (please print): Susan Ewig

Comment:

- SH 45SW does purport to increase mobility, but to a very small degree and at a very large cost - both to taxpayers and users.
- Fiscally, it is irresponsible.
- Environmentally, it is irresponsible.
- It is appalling to me that a better, long-term solution has not been found and put forward. Putting thousands more cars on MoPac everyday is not a solution.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): MARIANNE FITZGERALD

Comment:
I Recently moved to 78739 zip code and am appalled @ the traffic on BRODIE - which Formerly could handle it. 2 THINGS need to be done: SH45SW must be built @ the overpass @ SLAUGHTER & MoPac South needs to be done. THIS would really help the traffic & the environment, because cars wouldn't be sitting @ MoPac & SLAUGHTER waiting through 3 + 4 light cycles. And Brodie would become far more good for local use. IT JUST MAKES SENSE!

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Morgan Flowers

Comment: Building SH45 SW would be terrible for our springs and land. Water is crucial for our lives and the animals here in Austin as well. The pollutants that will be accumulating over the time they are building the new highway and after it is built as well. Our Natural Spring here in Austin must stay clean and flowing. Not to mention the 2 animals that are under extinction will not be good for them at all. They are extremely sensitive to water quality. There is no way to build it in a clean manner protecting the water. I AM totally against it.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): David Foreman 78739 (off Brodie Lane)

Comment: THIS ROAD MUST BE BUILT, IT WAS DETERMINED TO BE NECESSARY 25 YEARS AGO AND THE TRAFFIC HAS ONLY GOTTEN WORSE. WE THE CITY OF AUSTIN CANNOT TAKE AN OSTRICHES VIEW BY BURYING ITS HEAD IN THE SAND. IF THE ROAD IS NOT BUILT BRODIE WILL BECOME MORE CONGESTED, IT WILL NOT STOP THE DEVELOPMENT IN HAYS COUNTY & IT WILL NOT STOP PEOPLE FROM MOVING TO AUSTIN. THE ROAD MUST BE BUILT & S. MOPAC NEEDS OVERPASSES AND ADDITIONAL LANES NOW. THANK YOU.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): BETINA FOREMAN

Comment:
WE SHOULD NOT WAIT FOR 2035 TO BUILD SH-45 AS THERE IS AN EXTREME NEED NOW. I'VE LIVED OFF BRODIE FOR 12 YEARS & I HAVE SEEN TRAFFIC & TRAVEL TIMES ON BRODIE DOUBLE EVERY YEAR. THERE ARE DAYS I CANNOT GET OFF MY STREET & ONTO BRODIE FOR 20 MINUTES MUCH LESS TO MY END DESTINATION. THE LAND FOR THIS ROAD WAS PURCHASED IN THE MID 1990'S & IS NOW DESPERATELY NEEDED. THE NEW SH-45 WOULD PROTECT AUSTINS WATER QUALITY FAR BETTER THAN A 40 YEAR OLD ROAD THAT WAS NOT DESIGNED TO HANDLE 30K CARS A DAY. BRODIE LANE IS A NEIGHBORHOOD ROAD NOT A HIGHWAY & IT SHOULD BE TREATED AS SUCH. BUILD SH-45 NOW IT'S ONLY 20 YEARS LATE.

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WE WITH 150 PEOPLE A DAY MOVING TO AUSTIN NEED IT NOW NOT 20 YEARS FROM NOW!

JULY 29, 2014 – PUBLIC HEARING

* PEOPLE FROM HAYS COUNTY SPEED UP BRODIE GOING AS MUCH

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Kathy Gaillour

Comment:

SH 45 SW should be built ASAP. I believe the plan presented has taken into account all issues. I think the environmental issues in particular have been carefully thought out; they have been addressed to my satisfaction. Those who want to keep talking about it or studying it or trying to come up with other alternatives are either trying to stall until things are even worse or are hoping that people will just give up. Their arguments are not valid. When it's built, the access @ 1626 needs to be a flyover. It's ridiculous to use a stop light there.

It's time to move forward on this! We can't turn the clock back - Austin will never be a "medium-sized" city again. Those who've opposed growth in Austin have only achieved traffic gridlock.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Charles Gallatin

Comment: This road is overdue. The volume of traffic is only going to increase.

1. Stop the flood of cars going down Brodie + endangering kids.
2. stop the pollution from ~~cars~~ miles of cars waiting to get down 1626.
3. Improve safety for everyone who drives in this area.
4. Stop wasting gas ~~from~~ people having to travel further to get where they need to go, and from waiting in line.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Diane R. Gallatin

Comment:

As a resident of northern Hays County since 1986, I have seen the traffic congestion grow exponentially over the years. This project is past due in terms of need! In speaking with the consulting engineers and studying the pros & cons, I think this is a no-brainer. We have the technology and the design to protect the environment from polluting run-off and similar issues. Having thousands of cars stuck in traffic results in air pollution, excess fuel usage and a dramatic decrease in the quality of life. Please pass this project!

Thank you -

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Barbara Goodson

Comment: Please in my lifetime!
Build the road. Save BRODIE!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Heather + Rodney Gouraige

Comment: I disapprove of any toll road and the current proposal to build I-45. The current proposal does not respect the sovereignty of the city Council or the wishes of the majority of South Austin Residents Our opposition is significant, in terms of political, financial and economic mobilization. Circle C residents vote and we are opposed to building the highway due to its impact on our neighborhood and the larger environment. Please contact us with any questions Heather (512) 584 3692 Rodney (512) (780) 8554 8701 Escarpment Blvd, #132 Austin TX 78749

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): ROBERT G. GRAHAM

Comment: Living in Shady Hollow - just off Brodie and down Spotted Horse — for about 13 yrs.. Do I care about the environment? Absolutely! 13 yrs ago there was nothing at Slaughter and Brodie — you felt like you had suddenly arrived in the country-side! - away from the rapidly increasing "madness" of central Austin — and then you entered a quiet, almost "bucolic" feel to Shady Hollow. That's all gone - within about 10 yrs. You knew it would disappear once the new suburbs — housing developments — further south on Brodie, approaching FM1626 "popped up". Well its done - history! Now stop the horrible traffic going south and north on Brodie. Build 45! Stop I-35 using 1626 to get over to Brodie, and over to MOPAC. I don't care about salamanders — I care about my lungs - the pollution in the air - Keep such heavy traffic off Brodie

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Shawn Graham, P.E.

Comment:

I support the construction of SH 45 SW and feel this road should be built immediately following the required state environmental study's completion. The environmental groups who oppose this road need to stand by the local and state rules and regulations in place over the aquifer that will be complied with in the design and construction of SH 45 SW. These are rules & regs that they themselves helped craft and have adopted, yet they claim are now inadequate to treat the proposed runoff. Regarding the efforts to "keep MoPac local", MoPac has not been a "local" road in a long, long time. SH 45 SW will not substantially increase the traffic on MoPac, because that traffic is already going to MoPac. It is just sitting on congested local roads like Brodie, Slaughter, and Manchaca. Stop the nonsense and excuses; build the road now. And thanks to the TxDOT staff who have put in time and effort in the preparation of the Draft EIS.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Eli Halbreich June 5th 1992 - present.

Comment: The cons to this project, idea, theory; are to large and to severe to support this project. As a born and raised Austinite and active commuter/community member I highly oppose this project. ~~Not only for environmental but~~ & the environmental impact to Austin's gem, barton springs and a hidden treasure like the wild life center are too large to ignore. & the future consequences are too ugly to deny. Please, for the people born and raised in this wonderful life giving place, do NOT build this high way.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Sheila Hancock

Comment:

What's the delay?

Please build it now!!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): John Hantigan, 78749

Comment:

I am utterly opposed to this Road!
Please Don't Build it

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): SRIDHAR HARIHARAN

Comment:

I live in Bauerle Ranch (Estates) community off Sesbania and have to navigate via Brodie Lane every day. I can tell you commuting is hell. My life leaves home at 5:30 (without seeing kids) to avoid traffic. My friends (3 of them) sold and moved elsewhere due to traffic. The Brodie traffic spills into slaughter, all the way to Mopac. How can city give housing permits down Brodie & yet cite environment-reasons not to build SH45S.

• We need SH45W YESTERDAY !!!!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Olivia Harris

Comment: Edwards Aquifer = drinking water

SH 45 SW = MESSING WITH OUR DRINKING WATER

Traffic can encourage bikes, buses, carpool ... there are so many other alternatives

Think about the water quality for your children & grandchildren...

Keep your planet and family healthy.

IS THIS EVEN A QUESTION?

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): WILLIAM HERGOTZ BUDA

Comment: SH45 is badly needed (and overdue) to handle the rapidly increasing traffic from Manchaca, Buda & Kyle to Austin via MoPac Blvd. It will tie in well with new 5 lane FM 1626. It will relieve Shady Hollow of the heavy traffic on Brodie Lane from FM 1626 to Slaughter Lane and on to MoPac. It will not increase MoPac traffic as some contend.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Kevin Hoffman

Comment:

I frequently drive the route of Brodie Ln to FM 1626 and most of the time sit in miserable amounts of traffic. The construction or building of 45 SW would be a major improvement for not only myself but the many people I sit behind in traffic. Please build SH 45 SW.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Donald Inbody
1172 Live Oak Loop, Buda, TX 78610

Comment:

SH45 SW is important to the economic development of both Hays and Travis County. Thousands of people drive north to Travis County from Hays County every day to work and shop. Loss of time in transitting increases costs to both individuals who waste time in traffic. It also causes ~~but to businesses~~ loss ~~who lose~~ business ~~too~~ due to Hays County residents finding alternative sources south.

I fully support the SH45SW project. I have previously delivered a supporting statement to the Hays County Commission indicating full support by the homeowners of Hays County Oaks II, many of whom drive on Brodie each day.

D Inbody 512 923 0704 don@inbody.net

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Claire J. Inbody
1172 Live Oak Loop, Buda, TX 78610

Comment:
SH45 is necessary to relieve the extreme pressure on the current roads carrying residents to work, shop attend University and worship in Travis County. The residents currently living in Hays County who are working and economically interacting ~~and~~ with business in Travis county are spending long periods of time driving through local neighborhoods producing large amounts of backed up traffic and resultant increased exhaust and pollution in those areas of So. Austin. These Hays County residents bring Millions of dollars into Travis Cty. The amount of time spent in traffic is detrimental to the health and well being of all persons involved and the residential areas. 45 SW will being affected.

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relieve the amount of time spent traveling to and from work, recreation, school and worship and ~~the~~ home for residents of Hays County. This highway will benefit Hays and Travis County. Build it now! It should have been built long ago. No such ~~presidential~~ preferential treatment has been used against the residents of Williamson Cty. Hays Cty. residents will be and already are as essential to the city of Austin as the residents of Williamson Cty already are. Build 45 SH Now!

Jeannine Inbody

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): JOSE JARAMILLO

Comment:

45 SW IS A MUST TO ALLEVIATE BRODIE TRAFFIC & REDUCE AIR POLLUTION. FASTER TRAVEL LESS TIME ON ROAD POLLUTING OUR ENVIRONMENT.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Greg Kaufmann

Comment: Thank-You For building This much needed Road in an environmentally safe as possible way.

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): KEVIN KENNEDY

Comment:

I SUPPORT THE COMPLETION OF THE PROPOSED SH 45 SW PROJECT AND BELIEVE THE PROJECT PARTNERS WILL ADDRESS PUBLIC CONCERNS WITHIN REASON, GENERATING A "WIN-WIN" SOLUTION THAT PROTECTS SENSITIVE FEATURES WHILE IMPROVING MOBILITY AND RELIEVING CONGESTION.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): JOE LABRIOLA

Comment: WHETHER BUILT OR NOT BUILT LOOK AT HOW ROTARYS COULD POSITIVELY IMPACT TRAVEL TIMES AND POLLUTION.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Nancy Leeper

Comment:

Austin has been known as an environmentally-conscious city — forward thinking in protecting our planet as much as possible. Putting a highway on water quality protection lands would have a ~~deleterious~~ impact on many living creatures — so much wildlife — not to mention effects on neighbors such as the Wildflower Center, public parks.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): LLOYD MATTHYS

Comment:

SH 45 SW IS ABOUT 30 YEARS LATE. THIS ROAD SHOULD HAVE BEEN BUILT BEFORE SH 45 SE, THIS ~~WOULD~~ ROAD WOULD HAVE HELPED THE FLOW OF TRAFFIC FROM NORTHERN HAYS COUNTY TO AUSTIN. We need this road to alleviate the Traffic congestion on Brodie Lane. Housing developements are springing up all over Hays County. We need SH 45 SW now not 5 years from now.

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Renee Mauzy

Comment: Please build SH 45 SW without further delay

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Scott McAvay

Comment: It seems unnessecary to have any exit/on ramp to SH45 at Bliss Spillar when it is so close to FM 1626. This would/may bring traffic down Bliss Spillar Drive from FM 1624 through the Marbridge Foundation Community where this non profit houses, trains and educates 850 Adults with Cognitive Challenges..

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Donna Miller

Comment:

I am NOT in favor of this project. The area is too environmentally sensitive and our water source is too important to our future. We have other alternatives. This road is not worth what we will give up. [This is not going to fix the travel problem.] The studies and agreements are not in place. We are open to further legal challenges should we proceed. Obviously the science is not thoughtfully done and presented. More thoughtfull development and environmental growth would be helpfull for our children and their children. As one example of a problem, refer to Austin (City of Austin) letter to Carlos Lopez from Marc. Ott dated June 27, 2012.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): GRAHAM MOORE

Comment: THIS SEGMENT OF SH-45 IS DESPERATELY NEEDED TO HELP RESOLVE ONGOING SAFETY AND CONGESTION PROBLEMS. I AM CONFIDENT THAT THROUGH GOOD STEWARDSHIP, THE ENGINEERS THAT DESIGN THE ROADWAY CAN INCLUDE ADEQUATE ENVIRONMENTAL PROTECTIONS THAT WILL MAINTAIN THE QUALITY OF BARTON SPRINGS. PLEASE DO NOT DELAY THE PROJECT ANY FURTHER, IT'S TIME TO SIMPLY: BUILD THE ROAD.

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Katie Bell Moore

Comment:

SH45 should be built!

I've grown up in Austin and seen firsthand how the lack of planning for the future has made traffic one of the worst in the country. It's time to be forward thinking and build this environmentally highway.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): BRIAN MOULIN - 78748

Comment:

1) Please strongly consider installing 2 lanes from SH45SW Westbound to Mopac Northbound. If you don't, it will quickly clog up just like SH 71 Eastbound Flyover to IH35 Southbound.

2) Same comment as above for ~~anywhere~~ anywhere else you are only planning 1 lane. Please consider 2 lanes minimum, as it seems Central TX always builds too small for "actual" traffic.

3) At FM 1626 & SH45SW, do everything you can (build elevated flyovers) to avoid having signalized entrances/exits from SH45SW. This could very well end up being another ridiculed case of Central TX building too small.

4) If you can't build item 3, what are other options to avoid signals and backed-up traffic?

5) OVER-BUILD PLEASE, so we don't have to wait 20+ more years to fix a traffic problem again.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Deborah Murphy

Comment: I am very concerned about the effects of the land surrounding the proposed toll way. I don't feel enough analysis has occurred on the impacts on the additional traffic to Mopac between Escarpment and Slaughter, as well moving towards downtown. Also, I don't feel enough cars will be willing to pay the toll fees in order to alleviate the congestion. Toll = BAD IDEA

In general, I am very much against more toll roads as a solution to our traffic problems.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Julie MYHRE

Comment:

1) Safety - Please make a barrier between humans on foot / bikes to keep them safe from the 70 mph traffic. Place Fences to keep deer off the Hwy

2) Noise: account for the PFC asphalt.

3) Construction: Mitigations during construction is More critical to H_2O Quality than after. Revegetate with Native plants.

4) Put in a Park + Ride @ 1626

5) Address the econ. impacts of businesses at Shady Hollow Village.

6) Allow HOV riders to ride for FREE!

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☒ NONE OF THE ABOVE — I'm an affected neighbor.

JULY 29, 2014 – PUBLIC HEARING

TURN YOUR DRAWINGS + MAPS 180° SO North is FACING UP TOWARDS THE TOP OF THE PAGE!!

Hearing: July 29, 2014

Hello,
Thank you for allowing us to speak. My name is Julie Myhre and I am a resident of the Shady Hollow Estates Neighborhood. This project is literally right in our back yards, yet our neighborhood has no direct benefit, and only one indirect benefit of less traffic on Brodie Lane. Although there is no environmental justice issue or environmental legal recourse we can take, I would like to take this opportunity to suggest a few mitigation measures that can offset the direct effects of having to live with a tollway in our back yards.

I have a lot of experience ~~with these types of~~ projects; probably more than the people that wrote the EIS. I'm a Licensed Civil Engineer, ~~was a founder of a consulting firm in Minnesota that prepared Environmental Assessments and EIS~~ documents for interstate pipeline construction projects and ~~also~~ prepared Environmental Assessments for two major highway expansions on the Islands of Maui and the Big Island in Hawaii. To that end, I know what I'm talking about.

The EIS seems to cover the environmental issues fairly well, except I feel it failed to address a couple items. If the project included a couple minor modifications, it would add a significant number of benefits to the environment and to our local community:

3 areas need to be improved on the final EIS

1) SAFETY: There is a large deer population that live here – possibly hundreds. There will be car-deer collisions and this issue needs to be addressed. In May 2014 there were four dead deer, including one in my backyard, one on Green Emerald, and two on Brodie Lane. This project will remove living space for the deer, and essentially create extensive browsing habitat at the fringe between the woods and the highway right-of-way, inviting deer to be close to the traffic. Our neighborhood deer are extremely tame and are not going to shy away from the traffic. The DOT needs to address the deer population and mitigate to minimize the increase in car-deer collisions. Put in a barrier between people + cars/traffic

2) ECONOMIC IMPACTS: The EIS does not address the economic impacts on the Shady Hollow Village shopping area. With less immediate traffic, and with long range view of the development of the area, what is the immediate economic impact on the businesses in the area of Brodie Lane and Slaughter Avenue and how long will it take to recover that traffic volume (due to local development) to pre-construction levels? I assume many of the same businesses will be built in the future in these development areas, and because the communities surrounding the Shady Hollow Village are built out, and as stated in the traffic analysis, there will be significantly less traffic in this intersection, and there may be a significant economic impact due to less traffic.

HAVE THE TxDOT Project Manager COORDINATE THEIR PROJECTS!!

3) MULTI-MODAL TRANSPORTATION:

a. **Violet Crown Trail:** I was happy to see the stub-out planned for the Violet Crown Trail. There is a meeting planned at the Oak Hill, Hampton Branch library tomorrow evening to discuss the route of the trail further north. A benefit to the neighbors directly affected by this project – those of us that live in Shady Hollow area would be for this project to construct an extension of the trail into our neighborhood, and not leave it hanging at the edge of the right-of-way. The DOT should work with the City of Austin and Hill Country Conservancy to make this happen so that this portion of the trail can be constructed with the project.

I.E. 1626 project

b. **Park and Ride at 1626:** The DOT should work with CAMPO or Hays County to incorporate a Park-and-Ride lot near the 1626 intersection. This will encourage the use of this tollway and further create a benefit for the people that live in Shady Hollow and northern Hays County. The nearest park-and-ride for our neighborhood

is near the Y, and our neighborhood is underserved (not served) by mass transportation. Having a park-and-ride near our neighborhood would encourage mobility and use of mass transit and all the associated benefits.

MAKE IT FREE TO HOV's.

4) NOISE: The EIS is unclear if the assumed noise impacts incorporated the Permeable Friction Course or PFC asphalt into its calculations. I personally felt it was rather insulting to hear that the cost of mitigating for noise of $25,000 per affected unit. Who came up with that number? Although the EIS meets the letter of the law in terms of doing its noise study, I want you to know that there will be direct affect on ALL of the neighbors due to increased noise. The NOISE issue will be the largest impact. 3.4 dBA reduction at 60 mph was found using PFC, and overall a 6 to 7 dBA reduction was found on the MOPAC. http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/0-5836-2.pdf

UTA Transport

5) LAND USE IMPACTS AND MITIGATION:

a. **Runoff:** The EIS does a pretty good job explaining the impacts of the projects water resources, however it does not address the benefits of increased volume of water runoff to the Edward's Aquifer. In a former position as a hydrologist where I designed stormwater systems in Minnesota, I am very impressed the stormwater management facilities in this area of South Austin and particularly in our neighborhood. Most people probably don't even notice the structures. Given what I see in the neighbood, and the commitment that the DOT appears to be making to mitigate the water quality issues, this project will likely have a benefit of increasing water volumes into the aquifer, helping to mitigate the draw down of the groundwater. Regarding water quality, the mitigation measures planned appear to be standard practice and will address the aquifer issue. If it continues to be an issue, the DOT should consider installing a bridge over the Flint Cave region and include monitoring the final installed water quality structures for effectiveness and further mitigation as needed.

b. **Re-vegetation:** The DOT needs to prepare and include a re-vegetation plan into the EIS. It is critical to the environment that native vegetation plants be used and the plan should include long-term monitoring to ensure that the plants survive over three years. This is a standard requirement for pipeline rights-of-way.

Although the DOT is responsible to complying with the NEPA, this project would be so much better and would fit with the overall planning of the area with just a couple minor changes that would improve the project and ensure the success of the mitigation efforts.

This project is critical to our area as the land will continue to be developed along the hwy 1626 corridor. The project would be significantly better if the DOT considered the local impact to our neighborhood and incorporated my suggested mitigation measures. This project not only benefits the people of Northern Hays County, but it also benefit the entire Austin metro area by supporting the mobility and long-term economic growth.

As an environmentalist, I understand the benefit of protecting the natural environment, but after experiencing the affect of economic downturns and lack of planning in Hawaii, it is important as humans that we support transportation projects like this. If done correctly, the benefits are long lasting and positive to the economies of the area. Generally, even if people don't like to see development, they like to have nice roads to drive on, cheap food to eat, and clean water to drink, and cheap electricity. These are the things that make economies thrive. I want to live in a thriving community which is why I chose to move to Austin.

Submitted by Julie Myhre, PE

(808) 640-5333

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Steve Myers

Comment: To Wade Strong, P.E.
Current traffic southbound on MOPAC I must drive north on Hwy 45 for 1 mile then make a U-Turn at the Escarpment Crossing and drive 1 mile south on Hwy 45 in order to exit onto Archelet Way.
Since the SH 45 SW extension is making an intesection WHY do the plans NOT include a solution to this PROBLEM?
Is this another 290/71 Y in the Making?

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Chris Nappi

Comment: SH-45SW is long overdue and is leading to serious safety and economic issues to the neighborhoods along Brodie Lane. Much incorrect information has been spread by opponents of the road - most notably maps showing a connection to I-35, which this particular section of the road is NOT about.

SH-45SW can and should be built in an environmentally friendly way that will reduce emissions and improve safety on Brodie Lane.

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PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Ramon Nochis 7/29/2014

Comment: IN 1994, AUSTIN DISAPPROVED WHAT WAS CONSIDERED TO BE THE BEST FREEWAY PLANS IN THE NATION. IT WAS DISAPPROVED BY A CITY COUNCIL AND MAYOR DOMINATED BY A "NO GROWTH COALITION, SPEARHEADED BY S.O.S. SINCE THEN THIS SAME GROUP SUPPORTED OTHER IMPEDIMENTS TO COMPLETION OF MOPAC BEYOND BOTH BEE WHITE AND FROM SLAUGHTER LANE AND BEYOND. THE UNFORTUNATE PART ABOUT ALL OF THIS THE MAY DELAY I LOST THE AVAILABLE OF FEDERAL FUNDS, CREATED ONE OF THE WORSE AND UNSAFE HIGHWAY SYSTEMS IN THIS COUNTY

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Karl Nodine

Comment: There should be an overpass for traffic traveling East on 1626 preparing to turn left on 45 SW. This will improve traffic flow from an ever growing Hays CO.

As Westbound traffic on 45 SW approaches MoPAC, there should be two lanes that enter MoPAC North and one that continues on 45 SW. Build another berm to protect Hole 2505. Failure to have two lanes merging onto MoPac will result in a bottleneck, due to the majority of traffic that will be entering MoPAC

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Larry Odom

Comment:

It is way past time to build this road. The population is here and growing. The traffic will either idle along unprotected Brodie lane or zip Through SH 45 SW.

Let's get the traffic through this sensitive area more quickly.

I would prefer a Free road but will use the it as a toll road anyway

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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□ I could benefit monetarily from the project or other item about which I am commenting on

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Guadalupe Ramirez

Comment: This plan is only half measure Complete the plan for entire Southern Austin Region. Half way measures are not going to provide solutions. Build out complete loop to provide access across metro area. This toll way is only half of what is necessary for current and future needs. The bike path of walk way is waste. No more walks or rides near or parallel to noisy free way. Wasting land on sidewalk and bike path.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): DAVID Richardson

Comment: The schematic looks reasonable I support construction of this roadway to address future traffic from Hays County + relieve congestion on Brodie Lane

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Michelle Romage - Chamber

Comment: Please build this project. We need an alternate route from Hays to I H35.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): John Rowley

Comment:

I would like to see a more comprehensive plan that includes a study of the impact of traffic on 1826. Completing this section of road without a past a preliminary plan of improvements that will be needed once this section of I45 is built is contributing to the problem of overcongestion that is plaguing our highways today.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Zach Ryan

Comment: I live off Brodie in Shady Hollow and am very excited about the potential infrastructure to relieve our congestion. As a transportation engineer, I also think the design is well conceived and should help with the problems in south Austin.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): ARNOLD SCHAEFER

Comment:
Although I can see need for SW 45, it is a piecemeal project that will have very little benefit for ALL residents of SW Austin. It will allow people in Hays County to reach MoPAC more quickly, but will take a bad traffic situation on MoPAC now and make it worse. An integrated approach must be included in overall project in order of priority (and possibly cost) ~~be~~ will (1) Underpass (or overpass) from Slaughter to MoPAC; (2) Overpass or Underpass La Crosse; (3) increase lanes on MoPAC south of River.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Tami Seal

Comment:

As a resident of Shady Hollow for the past 12 years, I beg/plead/encourage TxDOT to proceed with the construction of SH 45 SW. Our small community/ neighborhood has been compromised with the never ending traffic congestion along Brodie lane. It is impossible for me to leave my neighborhood weekday mornings and evenings. Please lift the curse from Brodie Lane

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): STEVEN SELGER

Comment: I AM COMPLETELY IN SUPPORT OF CONSTRUCTING SH 45 SW. WITH THE INCREASE IN POPULATION IN SOUTH AUSTIN & HAYS COUNTY, IT IS IMPERATIVE THAT THE HWY BE BUILT. WITHOUT THIS ROUTE WILL CAUSE MAJOR TRAFFIC CHAOS.

THE ENVIRONMENTAL CONCERNS CAN BE MITIGATED WITH A SMALL AMOUNT OF EFFORT.

THIS ROAD IS A MAJOR NECESSITY TO THE AREA. BOILD IT NOW.

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): MAYUR SETHI

Comment:

YES TO SH 45 SW

→ IT WILL BE AWESOME

→ MY TAXPAYER MONEY WELL SPENT

→ LESS FRUSTATION BECAUSE OF CURRENT TRAFFIC ON BRODIE TO BUDA

→ FUTURE GROWTH OPPORTUNITIES

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): MICHAEL SEXTON

Comment:

BUILD 45 SW NOW. THE ROAD CAN BE BUILT USING THE LATEST ENVIRONMENTAL SAFEGUARDS TO PROTECT THE AQUIFER. WHILE WE PROTECT THE AQUIFER HERE WE CAN REMOVE TRAFFIC OFF BRODIE WHICH HAS NO ENV. PROTECTIONS. WE CAN ALSO GET TRAFFIC MOVING REDUCING AIR POLLUTION, REDUCE DELAYS AT MANCHACA INTERSECTION, PRESERVING STUDENT SAFETY IN THE PROCESS. IN SAN MARCOS THE CITY TOOK THE LEAD TO BUILD WONDER WORLD DRIVE IN THE SAME TYPE OF ENVIRONMENTAL CONDITIONS. They Preserved park land, Capture All Runoff and Reduced damage to their historic downtown area. South Austin is in desperate need for A true road network and this is an important step. Build it Now.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): B. Sharma.

Comment:

Although I'm new to the area, but being a resident along Brodie Ln I'm interested on knowing how this project is being developed and is eager to know arguments on both sides. As any other project of this scale in urban area there are always both positive & negative sides. Since both the engineering and human perception on such development practice has evolved a lot in last couple of years, I believe any negative impact can be easily minimized with the help of science & technology and proceed with the project so that current and future users can benefit and use their saved time on other productive works.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Todd Shelton

Comment: I have followed this subject very closely since my transfer to Travis County. I have read the environmental study cover to cover. To me, I can see no reason (ALL things considered) to hold up this project any further. As far as the sensitive areas along SH45SW are concerned, they are much safer than the sensitive areas along Bodie Ln. This needs to be built now, before any more congestion or environmental damage is done.

Thank You

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): CHONG SHIN

Comment:

I DON'T UNDERSTAND WHY THE PROPOSED SH45 SOUTH TOLL ROAD DOESN'T EXTEND TO I-35 & CONNECT TO SH45 E. THE LACK OF MOBILITY FROM EAST TO WEST & CONGESTION ON I-35 MAKES ACCESS TO SW AUSTIN DIFFICULT & WILL ONLY GET WORSE OVER TIME. IF WE CAN VOTE FOR A $1.4 TRILLION DOLLAR BAIL WHICH WILL DO NOTHING TO REDUCE TRAFFIC, WE SHOULD BE ABLE TO PASS FUNDS TO BUILD A ROAD WHICH WILL MOVE MANY MORE PEOPLE. SH45 WAS PASSED BY VOTERS 30 YEARS AGO YET NOTHING HAS BEEN DONE. BY THE TIME THIS FINALLY GETS BUILT IT WILL ALREADY BE TO LITTLE.

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SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): DAVID SIEFSEMA

Comment: BUILD SH45SW NOW

DO NOT DELAY

INCLUDE THE HIKE AND BIKE PATH

DON'T LET THE NAYSAYERS GET IN YOUR WAY

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): HANK Smith

Comment: I am an engineer that has lived in the Shady Hollow Area since 1985. I have also worked as an engineer on Several Roadways including the Construction of SH45 Between MoPac & 1826. On this Project I worked for TLED (then TWC) & Inspected the environmental Aspects of the Roadway along with the Members of SOS & BSEACD. That Road was built w/ no Environmental Impact & the Road can also be built w/ no Impact if proper Precautions are taken

Its time to Build SH45 SW to Solve Regional Transportation ISSUES

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): CAMERON STAFF

Comment: THANK YOU to EVERYONE INVOLVED IN THE PREPARATION & DEVELOPMENT OF THIS PROJECT. IT IS WONDERFUL THAT THIS PROJECT IS SO ENVIRONMENTALY & ECONOMICALY SENSITIVE. I BELIEVE THAT THIS IS AN INCREDIBLY IMPORTANT ROADWAY FOR THE HEALTH AND DEVELOPMENT OF SW AUSTIN. PLEASE WORK HARD to MOVE FORWARD WITH THIS PROJECT AS SOON AS POSSIBLE. ITS COMPLETION IS LONG OVERDUE & IT WILL BE SUCH A HUGE RELIEF TO SOUTH AUSTIN LOCAL ROADWAYS. WITH AUSTIN EXPANDING IN POPULATION SO RAPIDLY, IT IS SO VITAL FOR EVERYONE IN SOUTHERN TRAVIS Co & NORTHERN HAYS Co THAT THIS PROJECT MOVES FORWARD. THANKS AGAIN to ALL RESPONSIBLE!!

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JULY 29, 2014 – PUBLIC HEARING

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): JONATHAN STEINBERG

Comment:

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JULY 29, 2014 – PUBLIC HEARING

THE FRIENDSHIP ALLIANCE

A Neighborhood Alliance of
Northern Hays County

July 27, 2014

TxDOT– Austin District
Attention: Stacey Benningfield
P.O. Drawer 15426
Austin, TX 78761-5426

HAND DELIVERED
BOWIE HIGH SCHOOL
PUBLIC HEARING
July 29, 2014

Re: SHSW45 between FM1626 and MoPac Draft Environmental Impact Statement

Dear Texas Department of Transportation:

On behalf of 5 subdivisions with over 1,000 residents, we submit this letter commenting that the Draft Environmental Impact Statement (DEIS) prepared for the proposed road construction known as SHSW45 between FM1626 and MoPac is incomplete. We request that it be withdrawn until a DEIS can be prepared that encompasses all required elements.

We are the designated representatives of the Friendship Alliance, which is an association of 5 residential subdivisions in North Hays County. The residential population of these subdivisions exceeds 1000 residents. Over 10 years, our association has represented the concerns of the people in these subdivisions with the City of Dripping Springs, Hays County, the City of Austin, and Travis County. Many resident members of our group are located along or near FM 1826 as it traverses the Hays-Travis County line. A vast majority of these residents commute daily to the Austin Metroplex along FM 1826 to the existing segment of SH 45 and then north on MoPac. Consequently, we have been involved and following the progress of the proposed extension of SH 45 across the recharge zone south of the Wildflower center to connect MoPac with FM 1626. These are our comments to the DEIS.

1. The Texas Department of Transportations (TxDOT) rules require that the DEIS include a summary of studies conducted to determine the nature and extent of environmental impacts. 43 TAC Sec. 2.84(b)(1)(C). As more fully noted in the July 23, 2014, letter to Carlos Swonke from Marc Ott, there are three relevant studies not included in ths DEIS: 1) the TxDOT survey of karst features along the SH45 SW right of way; 2) the study by the Balcones Canyonlands Conservation Plan staff surveys of endangered bird species in areas close to the proposed SH 45 alignment; and 3) the City of Austin Flint Ridge Cave drainage basin study. This DEIS cannot be complete and in compliance with TxDOT rules until these studies are included in the DEIS.

2. The TxDOT rules require that the DEIS include a description of the direct, indirect, and cumulative effects of the project; 43 TAC Sec. 2.84 (b)(1)(E). The DEIS does not adequately address the increased traffic impact to the membership of Friendship Alliance and the residents

of the FM 1826 corridor. It seems certain to us that the residents of the Friendship Alliance subdivisions likely will see an increase in commuting time due of the addition of more commuters SOUTH of Slaughter Lane. Traffic lights on Northbound MoPac at LaCrosse and Slaughter already see substantial wait times. With the addition of the commuters diverted from Brodie to MoPac south of Slaughter Lane, it is reasonably anticipated that these intersections will only be delayed further. Our residents believe that our commute times will be extended by some number of minutes (easily 4-5), if not substantially more. This proposed project surely will not the benefit of any commuters along the FM 1826 corridor. The DEIS is incomplete in that it fails to adequately address the impacts to commuters along the FM 1826 corridor.

The DEIS technical paper states that it talked to local planning officials and developers to determine if there would be any additional developments. The technical paper concludes that the additional subdivisions would be "minimal". In our estimation, TxDOT has cherry-picked its sources from those that would benefit from the construction of this ill-conceived roadway. Our experience is that these types of infrastructure projects are not for the benefit of current residents. Rather, this road project will absolutely serve to benefit land development along the newly created roadway. The existing segment of SW 45 that we commute already has three new subdivisons: Greystone Ridge, Acuna, and Meridian. Certainly, these commuters have added to the traffic flow on northbound MoPac. If the proposed extension of SW is completed, there will be additional subdivisions created, which will add to the traffic flow and the environmental degradation. The DEIS conclusion of minimal impacts ignores common sense and is incomplete because it fails to adequately consider these impacts.

3. The DEIS inaccurately assess the degradation to water quality and its impact to the water shed. Indeed, it relies on the adequacy of existing water regulation and implementation to conclude that the impact to water quality will be "minimal". HOGWASH. And we use this term because as we drive by the water retention most everyday, they appear as though they are indeed used to wash hogs have been washed in them. These water quality enhancements are inadequate to the purpose since they are not regularly maintained or cleaned out. As a direct consequence, the current water quality regime is inadequate to insure "minimal" impacts to the areas water ways. Building a highway over the aquifer will result in the continued degradation of the aquifer. It is irresponsible to pretend otherwise for the sake of saving a few minutes of commuting time for future non-existent commuters at the expense of existing taxpaying commuters. The DEIS is inaccurate for this reason and a realistic reassessment should be completed.

It does not appear that the DEIS adequately assesses the impacts on traffic congestion, water protection, growth management, or fiscal responsibility of a new toll road over the Barton Springs recharge zone along the Hays/Travis county line. A good faith analysis of alternatives will find a safer, more affordable, and more environmentally sound solution that benefits all commuters. The Friendship Alliance believes that the Draft Environmental Impact Statement prepared for the proposed road construction known as SHSW45 between FM1626 and MoPac is

incomplete. We request that it be withdrawn until a DEIS can be prepared that encompasses all required elements.

Sincerely yours,

/s/
Rob Baxter
Goldenwood POA

/s/
Dixie Camp
Blue Creek POA

/s/
Laurie Coffin
Fieldstone POA

/s/
Neil Carman
Radiance POA

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): Catherine Stephens

Comment: I am for the Toll road.

1. I do not personally agree with having the road as a Toll, as I pay lots of taxes & I see this as a tax. However, this may cause less people to use the road, as I am concerned with more congestion on Mopac. So I am for the Toll
2. I recommend that a change on Mopac South at the Slaughter Lane Light is updated. The left turn lane should start back further to alleviate congestion. In addition, another Left only turn lane should be added. (There should be 2 left turn lanes, 2 straight, + on right turn.)
3. On 45 going Northbound at Escarpment, the left + turn curb needs to be shaved/cut in, as it makes the turn too hard to turn, + must turn at 5 mile per hour. Dangerous Safety

→ over →

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over →

JULY 29, 2014 – PUBLIC HEARING

4. Going northbound on Mopac from Slaughter, the exit coming on from Davis Lane, should have it's own lane, and another lane added to Mopac because there is room for another lane + it would relieve congestion. This would allow this lane to go through + end up being the right ramp to 290/71 E.

In Summary - These is new toll road will bring more congestion onto Mopac. To help alleviate the congestion, suggestions 2 + 4 + 5 will help. Suggestion #3 is for safety.

5. South bound from William Cannon - It goes from 3 lanes to 2. There's room for 3 lanes + this would help with traffic.

SH 45 SW
ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): Matt Surina

Comment:

How can we add funding to this plan to contruct either an overpass or underpass at current SH45 & Escarpment? Or at least a traffic light. It is already currently a dangerous intersection when SH45 is 70 mph and is only 1 mile long. It will be even more dangerous when it is 3.6 miles long. As this plan stands, I am against it. If an underpass/overpass is added to Escarpment — I will be for it.

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COMMENT FORM

Name (please print): ROBBY TEFFT

Comment:

AS A RESIDENT OFF BRODIE LANE, IT IS VERY CONGESTED. I BELIEVE THE LOWER SPEED LIMITS & TWO LANES HELP CONTROL THE FLOW, BUT NOT THE VOLUME SH 45 SW WILL HELP THE VOLUME OF TRAFFIC.

IN CONJUNCTION WITH SH 45 SW, IT IS EQUALLY IMPORTANT TO COMPLETE MOPAC SOUTH: FINISH THE SECTIONS AT SLAUGHTER & LACROSSE TO FULLY BENIFIT SH 45 SW.

I AM FOR SH 45 !!

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ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): Susan Tennison

Comment: Please build SH 45 NOW!
Also, would you please put noise walls along the highway for those of us living near the proposed road, but used to the quiet. I live in Chaparral Park & enjoy the quiet - - - but I want SH 45 NOW!

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S Tennison

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ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): Susan Tennison

Comment: I live off of Bliss Spillway. We have an abundance of deer. What measures will be taken to minimize deer along the highway? ~~How~~ Will it minimize hoop on the highway? Will noise walls prevent the wildlife from venturing onto the roadway?

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COMMENT FORM

Name (please print): Linda Thill

Comment: Please build SH45 to relieve traffic on Brodie Lane. We have been promised this since we moved to the area in 1985.

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COMMENT FORM

Name (please print): RICHARD THOMPSON

Comment:

Please just build it. Also lets build SH 45 from 1626 to I 35 that would be awesome.

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COMMENT FORM

Name (please print): Donna Tiemann

Comment:

The proposed SH45SW project provides too little benefit for the investment and jeopardy it creates. The draft EIS is missing critical scientific data that is crucial to understanding potential environmental impacts and necessary for project environmental design. The lack of scientific data may explain the lack of information in the DEIS on road design and environmental protection measures. With the project being touted to be "the most environmentally safe road ever built in Travis County" it is disappointing to find no supporting evidence of that in the DEIS. This project jeopardizes the Consent Agreement between TxDot and the aquifer conservation district and the Balcones Canyonlands Conservation Plan (BCCP). The BCCP has enabled billions of dollars of economic benefit and provides far more benefit to our community than this single road project ever could. Pity what this road may in the end cost.

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COMMENT FORM

Name (please print): Kevin Todd

Comment:

Build the Road, it has been put off long enough. The growth is already here and more is coming. Not ~~[illegible]~~ building the Road thinking it is going to stop growth is silly. Build the ~~[illegible]~~ Road, it was needed years ago.

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COMMENT FORM

Name (please print): Bob Tuck

Comment:

I hope you don't plan on plugging up caves with concrete.

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COMMENT FORM

Name (please print): Jeffrey Usakewicz

Comment: I'm in favor of building SH 45SW. This road is needed to alleviate traffic on Brodie, Slaughter, FM1626 roads. The increasing population forecast for South Austin & northern Hays County warrants construction. All major TX cities have loops encircling their cities. For Example, Houston, Dallas & San Antonio have inner & outer loops. Austin has none. SH45SW will facilite traffic, shorten commute times to ~~Aus~~ Austin and reroute traffic so that neighborhoods are not infringed upon. This road is over due - movies have been extended the public demands it. Those opposed have

(over)

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environmental concerns. what about MoPac which is built over the aquifer? what about the rock crusher off FM967 also built over the aquifer.? The politician opposed do not live and drive the roads in our area. These folks need to check their political agendas at the door and vote for this road because it is needed desperately.

Thank you for the opportunity to comment!

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ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): Lori Vogel

Comment:

This road is needed for safety as well as traffic relief - I live in Shady Hollow and would love to allow my children to walk to the pool, friends houses etc. However with the flow of traffic it is not safe. Please do not wait until someone dies before you realize how much this is needed.

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COMMENT FORM

Name (please print): CHERYL WATROBKA

Comment:

It appears that little or no consideration has been given to safety issues at Archetta Blvd. Greyrock Ridge was granted an exception (probably ill-advised) to have only one entrance/exit road. The right turn from 45 to enter Greyrock and the turn to exit Greyrock onto Archetta are already treacherous. All resident must use Escarpment and unnamed turn-arounds in a stretch of road with high speed limits (70 mph). Continued consideration of SH45SW should include (1) considering lowering the speed limit; (2) maintaining safe and convenient turnarounds; (3) providing another access into/out of Greyrock; and (4) Consideration of access by emergency vehicles. Also please consider adding traffic signals at Greyrock, Araya + Meridian.

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COMMENT FORM

Name (please print): Jan Watson

Comment:

I'm ready to begin project! Living in far South Austin Offers 2 North/South hwys 35 + Mopac. I often take the toll road East of 35 during peak traffic times AM + PM to travel to Round Rock. I'm also ready for you all to combine the East toll road w/ SH45SW

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COMMENT FORM

Name (please print): Ron Welch

Comment: I did not notice the intersection at LaCrosse on the map. Will it be overpassed/underpassed as well as Slaughter lane?

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COMMENT FORM

Name (please print): GAIL Whitfield

Comment: - there have been NO NEW ROAD IMPROVEMENTS in South FOR YEARS it's time to Build this ROAD

- ~~TRAFFIC~~

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COMMENT FORM

Name (please print): Marcus Whitfield

Comment: We really need this extention to Mopac. It will relieve congestion on Brodie and add a great link to the Travis County/Hay County corridors.

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COMMENT FORM

Name (please print): LISA WILLIAMS

Comment: Not only will this road not relieve traffic to an extent to justify its expense, but I don't believe other less expensive alternatives have been adequately explored. Surely the $115 M it would cost to build this road could be put to better use - such as to improve the hospitals in south Austin (which was the only good argument I've heard in support of the road) to negate the need to transport patients to central Austin. Please explore other alternatives - expand Brodie (condemn properties if you must), install more traffic lights, expand Manchaca, etc. change timing.

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ENVIRONMENTAL STUDY

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COMMENT FORM

Name (please print): DAVID WILSON

Comment: WIDEN & IF 45 TOLLWAY IS APPROVED AND BUILT HOW WILL IT BE COORDINATED WITH THE BUILDING OF UNDERPASSES AT SLAUGHTER & LACROSSE INTERSECTIONS ON MOPAC. IT WOULD BE - I WOULD HOPE - PRUDENT TO BUILD THESE AT THE SAME TIME

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COMMENT FORM

Name (please print): SANDRA Workey

Comment: [redacted]

SH45 SW is necessary and needed. Builders continue to build housing and this road would ease the traffic on neighborhood roads.

If the road is not built you will see that Austin becomes a city of non-doers. Please build this road.

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COMMENT FORM

Name (please print): DENNIS WORLEY

Comment: [redacted]

I SUPPORT THE BUILDING OF SH45 SW. THIS ROAD IS DESPERATELY NEEDED. I BUILT MY HOME IN 1990 AND BRODIE WAS NOT EXTENDED THROUGH TO 1626. WE WERE PROMISED WHEN THE BRODIE LANE WAS COMPLETED TO 1626 THAT SH45 SW WOULD BE BUILT. IT IS TIME TO FULFILL THAT COMMITMENT.

Dennis Worley

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COMMENT FORM

Name (please print): RICARDO ZAMARRIPA

Comment:

PLEASE APPROVE THIS PROJECT AND BUILD IT AS SOON AS POSSIBLE. THIS IS AN ABSOLUTELY NECESSARY PART OF THE CENTRAL TEXAS INFASTRUCTURE.

THANKS FOR HAVING THIS MEETING.

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COMMENT FORM

Name (please print): Courtney

Comment:

– What has been discussed with Markridge Ranch? What is the impact to their property at Belle & Blue Feather? Do they [illegible] against the project?

– I respectfully request the project make sure all considerations are given to [illegible] water quality & protection, light intrusion and protection the integrity of our area at Belle & Blue Feather. We moved there for a quality of life – a connection to the quietness of the Country next to a big city – we have wildlife that we enjoy very much!

Thank you

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□ I do business with TxDOT
□ I could benefit monetarily from the project or other item about which I am commenting on

JULY 29, 2014 – PUBLIC HEARING

Comment

Build IT!

SH 45 SW
ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

Name (please print): _____

Comment:

This road is being built to accomodate people who live in Kyle & Buda. Those living in SW Travis County will have their quality of life impacted by the proposed location of this highway. I understand that this easement has been owned by TXDOT, but it passes through the middle of COA Water Quality Land. This land is home to significant Karst features, the endangered Golden-cheeked Warbler (certain breeding seasons), and significant cultural sites, and a wide variety of wildlife & plants. The introduction →

Written comments may also be mailed to TxDOT/Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

This form may be used to provide written comments on this project. Any questions placed on this form will not be considered an open records request and will not be treated as such. If you have an open records request, it must be submitted under a separate letter.

(Texas Transportation Code, §201.811(a)(5). Check each of the following boxes that may apply to you:
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JULY 29, 2014 – PUBLIC HEARING

→ of this corridor will allow people to easily access these rare features & significant archeological sites. How will people be kept from leaving the roadway? There has already been a death from people illegally trying to obtain protected artifacts. Other solutions must be reviewed like alternative routes east of Kyle & Buda that do not have such a significant impact on the environment.

Email Comment

From: Stacey Benningfield [mailto:[redacted]
Cc: Doug Booher; Lucas Short; Wade Strong [redacted]Randall Dillard
Subject: RE: Protest of SH 45 SW Construction

Ms. Bryan,

This is to acknowledge receipt of your email concerning the proposed SH 45SW project. Your opposition to the project is noted and your comment will be included in the official record of the public hearing.

Thank you,
sb

From: Stacey Benningfield
Sent: Wednesday, August 06, 2014 1:01 PM
To: Stacey Benningfield
Subject: FW: Protest of SH 45 SW Construction

From: Bryan, Kathy[redacted]
Sent: Friday, August 01, 2014 11:15 AM
To: Stacey Benningfield
Subject: Protest of SH 45 SW Construction

I have been unable to attend public meetings on the proposed SH 45 toll road that will affect MoPac commuters in Southwest Austin. How can I protest its construction? I want TxDot to know that many people are against its construction but may not be coming out to the public meetings. Thank you.

Kathy Bryan
[redacted]

-----Original Message-----
From: [redacted]
Sent: Tuesday, July 29, 2014 6:11 PM
To: AUSINFO
Subject: TxDOT Internet E-Mail

Name: Ms. Patricia Murphree[redacted]>
Address:
[redacted]

Phone:
[redacted]

Requested Contact Method: Email

Reason for Contact: Construction project
Complaint: No

Nearest Major City: Austin

Comment: Dear TXDOT,
Please do not allow SR 45 to be completed over to MOPAC. MOPAC is already a traffic nightmare, and diverting I-35 traffic over to MOPAC without first adding extra lanes to downtown will only clog it more AND threaten our water supply, the sensitive ecosystem, and the Lady Bird Johnson Wildflower Center. Thank you for your consideration

Webmail Comments

First Name	Last Name	Message	Date Created
Dorinda	Scott	I was appalled to learn of TXDOT's EIS findings on the proposed SH 45 SW aquifer toll road. A major roadway over Edward's Aquifer recharge zones WILL have significant impacts to water quality, as well as habitat loss in endangered species ranges. The USFWS should have final say on this one and be the one to grant any permits. Simply repeatedly saying the impacts will be negligible numerous times throughout the EIS without ever providing any substance to back up that claim does not make it so.	2014-06-30 17:33:08
Steven	Selger	Building this roadway is the most critical project that needs to be built immediately. With the increase in population in Austin and Hays County, the best planning practice is to improve overall circulation of traffic around and to Austin from all directions. Environmental mitigation can easily be accomplished along with the road construction. Any decision not to build this roadway would be catastrophic to Austin and its surrounding communities. Do not permit the myopic environmental fanatics to have their way with this proposal.	6/30/2014 17:35
Thomas	Heikkala	I don't want to see this highway built, because it endangers the Edwards Aquafer, creates more polution, and destroys more of the environment.	2014-06-30 22:27:05
Roger	Brown	Please do not let the "not in my back yard" or "don't add more people to Mopac" people get this project cancelled. We can not stop the growth and if we grow we must continue to build highways in an environmentally safe way.	2014-07-02 15:11:05
David	Richardson	the resolution or these PDF files is inadequate to distinguish features necessary to make meaningful comments on the project. My hope is that the files will be broken down into smaller files (geographically) so that map text is readable and not blurry. Thank you	2014-07-02 21:48:54
Julie	Perkins	Construction of this toll road will do NOTHING to relieve traffic going north on Mopac from Brodie and Buda, etc. other than to MOVE THE LOGJAM unless under or overpasses at La Crosse and Slaughter are completed FIRST. Continuous flow intersections or other creative intersection types will not be sufficient. The exponential growth in this area must be taken into account, as well as future growth and extra cars from the enormous developments which have begun to be built, but not anywhere near completion.	2014-07-02 22:35:52
Kevin	Tomasek	Please get this road built !!! It was approved by voters in 1985 ! The right of way was purchase 15 years ago. Pollutions problems can only improve with removing 1000's of cars stopping for the light at brodie and slaughter. Stop dragging the feet and move this along as FAST as possible. I have lived in this area for 20 years and I would like to see this road done before I die...	2014-07-03 11:02:32

First Name	Last Name	Message	Date Created
Charles	Loosen	I oppose proposed plans to construct the SH45SW road. My objections are as follows: * The proposed road falls within the Edwards Aquifer recharge zone. TxDOT has used vague language to assuage concerns of aquifer contamination. Vague language is unacceptable in formal statements and/or planning documents released for public comment. * Recharge features and flow paths have not been identified. TxDOT uses vague language to assuage public concerns, making assurances that best practices will be utilized to mitigate contamination of water resources. These best practices are not articulated, and this lack of detail demonstrates that assessment is incomplete. The purpose of assessments is to determine whether a vision should proceed to planning phases. * TxDOT's track record developing toll roads is poor. Toll infrastructure goes to waste while comprehensive transportation solutions are not emerging. * TxDOT's track record of targeted investment is poor. The proposed SH45SW road builds the infrastructure to feed sprawl - and thereby increase strain upon other aging infrastructure - without addressing traffic relief needs of the region's commercial and economic core. * TxDOT's impact statement does not speak to the environmental, social, and economic benefits of density, and instead advances pro-sprawl policy that is not in the public interest. * The statement document is an expression of intent that has been titled so as to appear as though it is an assessment; this is intentionally deceptive. * Intentional deception of the public trust is only necessary when impacts will be deleterious to the public. * SH45SW planning and policy discussions and their subsequent debate detract from constructive solutions to other critical infrastructure needs.	2014-07-05 01:21:20
V Bruce	Evans	Enough already! Build SH 45W NOW! The congestion that folks continually complain about (& rightfully so) is mainly the result of errors in judgment and lack of intestinal fortitude by the majority of our elected officials. Yes there are a lot of people on the roads, simply because there are a lot of people (darn it, they came anyway!) and too few roads. People do not drive up and down I35 & MoPark because they want to, but because they have to. Downtown is not everyone's destination, for many it's just a pain that has to be traversed to navigate to other parts of the community. Had we built the crosstown expressways as were originally planned and actually completed the loops (both the expressways and loops were on transportation plans created in the 1960's) we would now have the population density located in naturally developing "town centers" that would have developed around the intersections of the infrastructure. And just think, it would not be necessary to waste billions building useless rail; instead those dollars could be directed to providing public transportation to those actually in need of public transportation.	2014-07-09 19:30:27
Kristi	Michener	I thank you for your sharing of this information. I am very much in support of this recommended toll road to connect FM 1626 and SH45SW. I am grateful that such a logical and practical solution has been put forth and that the Right of Way is already set aside for this. I agree that any of the other alternatives would be poor choices and hope that this decision can be made and acted upon within the not-too-distant future.	2014-07-10 15:55:25
V	Shah	I like 4 lane option...it is time to move on....	2014-07-12 10:33:45

First Name	Last Name	Message	Date Created
Vincent	Musat	Please build SH 45 SW and also improve the other highways in Southwest Austin. We need more connectivity to other areas in Austin. We are tired of sitting in traffic in SW Austin! While you are building SH 45 SW connect it to IH35 and also build an overpass for Highway 71 at William Cannon and an interchange at the "Y" in Oakhill. All of these projects are long overdue and keep getting reinvestigated with my tax dollars on environmental studies. The solution that is being built in Oak Hill right now, while it works in a computer simulation will be too complicated for drivers to comprehend and will more than likely lead to many accidents... Quit wasting my tax dollars and build some roads!	2014-07-14 11:02:40
Scot	Krieger	I am in favor of moving forward with SH 45 SW. It will be an overdue traffic relief route for SW Travis County and northern Hays County.	2014-07-14 11:06:51
Matt	Hooks	I support the SH45SW extension. Allowing cars to take a more direct route will not only reduce miles driven and pollution but will also reduce frustration.	2014-07-15 16:07:43
Richard	Ginn	SH45 will intersect with Bliss Spillar Road. Will there be direct access to/from SH45 from Bliss Spillar? If not, will Bliss Spillar pass under (underpass) or over SH45 (overpass)? How will the intersection with FM 1626, which is now under reconstruction, be configured?	2014-07-16 12:17:51
Ann	Ryan	Hi can you tell me what the format of the public hearing will be? I see the open house is from 5-6p, will I need to fill out a public comment card by a certain time? I see the technical presentations start at 6p, how long do you think the presentations will go? An hour? What time do you think the public comments will begin? 7pm? Also how much time is each citizen allotted if they want to give a public comment? Thanks	2014-07-17 08:59:08
Brandon	Janes	I strongly support the completion of SH 45SW. We need the additional capacity for transportation in the area. It is long overdue.	2014-07-17 20:12:45
Anthony	Buonodono	I support this project moving forward as soon as possible.	2014-07-18 08:12:46
David	Jones	As a resident that lives off of the existing SH 45, I believe that this new section of SH 45 needs to be built. - It will take vehicles off of the neighborhood streets and on to highways - It will add more conductivity to the area. This city doesn't need another half built idea like 360 and Loop 1. The only negative I see with the current plan is that the 2 lights at Lacrosse and Slaughter need to be replaced and made under passes. Also the schematic shows an awful tie in from Mopac south to SH 45 east. 150 foot radius for that many cars will back up every day. Please revisit this issue.	2014-07-18 08:22:42
rob	baxter	As a 20+ year resident of Northern Hays County who lives in the RR1826 corridor, I cannot protest enough how this connector plan was nefariously slipped by the public through the swapping of highway funds from Federally backed funds to local funds, just to get around a properly run Federal EIS. I know no one who lives along 1826 or 290W who wants this tollway executed. Some for environmental concerns, which are fairly apparent given the Karst features all over that route, but in particular for the excessive and un-managable amounts of traffic that will be siphoned over to MoPAC south as soon as it becomes a replacement/alternative to I-35, something that was never intended for MoPAC and should be avoided entirely and always. This connector is a bad idea based in greed, not need, and as soon as it is open everyone in the region who commutes on MoPAC south will be outraged at this stupid, stupid decision and the gridlock it fosters. Its lack of forethought and inverse concern for the future of the area and/or the present residents today will	2014-07-18 17:59:53

First Name	Last Name	Message	Date Created
		haunt us all when that time comes. Simply irresponsible and reckless, there is just no other way to describe it.	
Daniel	Hodges	I support the new construction for SH 45 SW.	2014-07-21 12:49:12
Sandra	Mauldin	SH 45 SW will improve regional connectivity while providing an alternative to today's highly-congested roadways.	2014-07-21 12:52:46
Brandon	Janes	I strongly support completing this project. This road is long overdue, having been approved by voters in 1997. More than 100 people move to the region every day and transportation infrastructure investments are critically-important.	2014-07-21 13:08:29
Joe	Tracy	I support SH 45 SW for the following reasons: Voters approved this regionally-significant project in 1997. • Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. • SH 45 SW will improve regional connectivity. • SH 45 SW will provide an alternative to today's highly-congested roadways. • More than 100 people move to the region every day and transportation infrastructure investments are critically-important.	2014-07-21 13:15:30
mark	zimmerman	I support SH 45 SW	2014-07-21 13:19:22
Diana	Zuniga	Please support SH45 SW. Consider the following: • Voters approved this regionally-significant project in 1997. • Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. • SH 45 SW will improve regional connectivity. • SH 45 SW will provide an alternative to today's highly-congested roadways. • More than 100 people move to the region every day and transportation infrastructure investments are critically-important. Please do what is best for our region and support SH45 SW. Thank you	2014-07-21 13:23:42
JOHN	NASH	I support SH 45 SW. There is much growth in the area and the road is long overdue.	2014-07-21 13:25:33
Steve	Matthews	• We want this road: Voters approved this regionally-significant project in 1997. • Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. • SH 45 SW will improve regional connectivity. • SH 45 SW will provide an alternative to today's highly-congested roadways.	2014-07-21 13:27:38
James	Schissler	I support the construction of SH 45 SW since it will provide an important part of the regional infrastructure of the Central Texas Region. It will allow thousand of vehicles that currently use Brodie Lane and Slaughter Lane, neither of which provide storm water quality control, to use a roadway that will include current storm water quality controls and therefore reduce the impact on the recharge zone. SH 45 SW previously had an Environmental Impact Analysis that was approved by TxDOT but expired. The road was most recently studies by a Travis County Task Force in 2008 and the conclusion was that is should be constructed.	2014-07-21 13:33:52
James	Schissler	I support the construction of SH 45 SW since it will provide an important part of the regional infrastructure of the Central Texas Region. It will allow thousand of vehicles that currently use Brodie Lane and Slaughter Lane, neither of which provide storm water quality control, to use a roadway that will include current storm water quality controls and therefore reduce the impact on the recharge zone. SH 45 SW previously had an Environmental Impact Analysis that was approved by TxDOT but expired. The road was most recently studies by a Travis County Task Force in 2008 and the conclusion was that is should be constructed.	2014-07-21 13:34:00

First Name	Last Name	Message	Date Created
Fred	Heldenfels, IV	I support the preferred alternative and want it built as soon as possible.	2014-07-21 13:38:29
Ward	Tisdale	SH 45 was approved by the voters in 1997 yet it is still not built. Please not delay this project any further and complete it as quickly as possible. It's well known that more than 100 people are moving to Austin every day and our traffic congestion has reached intolerable levels, threatening our economic prosperity and high quality of life. Build SH 45 now! Thank you, Ward Tisdale	2014-07-21 13:40:30
Wes	Peoples	Please approve SH 45 SW which has already been approved by the voters. I hope that you won't put the desires of a few over the needs of so many in SW Austin. This project will improve mobility and regional connectivity. It will also help take the dangerous and unyielding traffic off of residential areas such as Shady Hollow.	2014-07-21 13:42:59
Rudy	Belton	I support the construction of SH 45 SW. Let's get this and other needed roadways built!!	2014-07-21 13:46:43
Gary	Robinson	This road needs to be build now. Its time to take the environmentalists out of the picture.	2014-07-21 14:07:36
Mike	Crockett	I am in support of SH 45 SW. Austin needs this road! Thank you. Mike Crockett	2014-07-21 14:08:27
Jim	Rado	Please do not let unfounded fear about the environment cause the pain and misery of those WITH JOBS that we need to support our community to continue. BUILD THE ROAD!!!	2014-07-21 14:13:18
Brant	Smith	• We want this road: Voters approved this regionally-significant project in 1997. • Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. • SH 45 SW will improve regional connectivity. • SH 45 SW will provide an alternative to today's highly-congested roadways. • More than 100 people move to the region every day and transportation infrastructure investments are critically-important.	2014-07-21 14:27:04
Seth	Johnston	We want this road. With so many people moving to Austin, we must provide the infrastructure.	2014-07-21 15:51:41
Cathy	Coneway	With more than 130 people moving to the region daily, transportation infrastructure investments are essential. We voted on this road in 1997...Build it!	2014-07-21 17:02:40
John	Harrison	SH45 is absolutely needed. I live in Shady Hollow and the cut through traffic to/from Hays County is terrible. The pollution, lost time, and degradation of our neighborhood is becoming critical. Brodie Lane was not designed for this kind of traffic!! I encourage quick completion of this extension. Thank you	2014-07-22 10:26:44
Raymond	Hayes	I strongly SUPPORT the construction of SH45 south. This stretch of road is long overdue and has been mandated by taxpayers for years. Please move forward immediately.	2014-07-22 12:05:04
M	Needham	Austin used to be a pretty livable city. the TxDOT development of endless roads, crazy intersections, and blocking of any meaningful form of public transportation means that it is a lot less attractive than it was. it is really time to consider alternatives to building on the aquifer, making all roads wider, and bowing down to the one-person per vehicle traffic. Many other cities have figured out better ways and it is time for Austin to get focused on something other than more cars everywhere you look!	2014-07-22 15:25:21
Rob	Hagelberg	Please build SH 45 SW. We need this for sustainable growth and traffic relief. Support is broad and diversified.	2014-07-22 16:42:27
Bill	Knippa	The environmental impact study concerning noise pollution resulting from the completion of SH45 notes that four houses that the noise would impact would not be considered for noise abatement treatment because the cost would be too high. Is this correct? If so, what are the addresses of the four houses that will be impacted with no abatement offered. Thank you.	2014-07-22 16:55:25

First Name	Last Name	Message	Date Created
Derly	Rivera	Will 18 wheelers and other large multi-axle trucks have access to the toll road 45, on to Mopac north and south?	2014-07-22 19:25:21
Patrick	Rose	I support collaborative efforts between the state and local jurisdictions that will lead to the construction of this important road. It will improve safety and convenience for thousands of families in SW Travis and N Hays counties.	2014-07-24 05:22:41
Paul	Arcediano	SH 45 SW will provide an alternative to today's highly-congested roadways. Please build this road.	2014-07-24 15:05:29
Clark	Matheney	We need this road now and we need to connect it to I-35.	2014-07-24 15:11:42
Ian	Turpin	re Road SH 45 SW: This road is vital for Austin's economy & future because: - SH 45 SW will improve regional connectivity by providing an alternative to today's highly-congested roadways. - More than 100 people move to the region every day & transportation infrastructure investments are critically-important. In addition, voters already approved this regionally significant project in 1997. Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway.	2014-07-24 15:16:52
Scott	Derber	Imperative that we find transportation solutions, of all kinds. I agree that toll funding is the quickest, most viable way to get this project built in today's political environment.	2014-07-24 15:35:36
William	McLean	• We want this road: Voters approved this regionally-significant project in 1997. • Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. • SH 45 SW will improve regional connectivity. • SH 45 SW will provide an alternative to today's highly-congested roadways. • More than 100 people move to the region every day and transportation infrastructure investments are critically-important.	2014-07-24 15:43:47
jerry	davison	It appears to me that the project will be harmful to the environment, so I hope you do not go forward. Thank you for your consideration.	2014-07-24 15:47:44
Gary	Farmer	I am writing to offer my strongest support for building SH 45 SW. The voters of Travis County approved this project in 1997. We need to improve regional mobility & connectivity while taking increased traffic off of the neighborhood streets. Our growth pattern for the past 134 years suggests that our populatiojn will again double in the next 20 years. Without new capacity, very dangerous driving conditions will occur and a deminution in the quality of life that we enjoy will certainly follow. Thanks for your consideration of these comments. let's build this much needed road.	2014-07-24 15:50:35
T	Bell	The lengthy document Environmental Impact Statement for 45SW is riddled with unsupported assertions that the toll road will have "negligible" impacts on the environment. I encourage you to read http://www.keepmopaclocal.org/phocadownload/deis%20talking%20points.pdf	2014-07-24 15:56:02
Dorinda	Scott	We need to Keep MoPac Local, period. The aquifer toll road WILL have environmental impacts, such as runoff into recharge features of our aquifer that flows right to Barton Springs, the crown jewel of our city. It is not for sale. Additional developments will be attracted to this sensitive area, increasing contaminated runoff. The road will get tire rubber, vehicle fluid drips/leaks, exhaust emissions deposited on it from traffic, that then runs off into the recharge zone, contaminating our aquifer. The road itself will increase impervious cover over recharge features. And, the road will not lessen traffic congestion, just move it around some. Please, do NOT approve this aquifer toll road, it is not needed, it will cause environmental damage to native habitats of rare and endangered species, including general wildlife and plants, it will increase contamination of nearby lands and the aquifer below. This SH45 is a boondoggle and an environmental catastrophe just waiting to happen.	2014-07-24 16:00:27

First Name	Last Name	Message	Date Created
		How any environmental assessment could conclude no likely adverse impacts is beyond all reason. Must just be the almighty dollar talking.	
Daina	Holliday	The document fails to provide an honest evaluation of the likely effects of the proposed project on Mopac traffic, traffic on other area roadways, water quality, and noise, air, light, and visual pollution. Specifically: *The draft EIS fails to analyze the whole (and real) project. An honest environmental analysis must look at this whole project – rather than chopping it up into four separate pieces as TxDOT is currently doing. *The draft EIS is premature and fails to actually study the impacts. Please withdraw the DEIS and republish when the required studies are completed. *The draft EIS ignores noise, air, light and visual pollution effects on Mopac corridor neighborhoods, public lands, and the Lady Bird Johnson Wildflower Center. Please study the harm to Mopac corridor neighbors, the Wildflower Center, and public parks and preserves resulting from air, noise, light, and visual pollution from the proposed 45SW toll road and necessary Mopac expansion. *The draft EIS fails to consider better, more affordable and sustainable alternatives. Please invest in these “shared solutions” that are more effective and do not pave over the Barton Springs Edwards Aquifer recharge zone.	2014-07-24 16:19:14
alice	mabry	To Whom it May Concern, I DO NOT SUPPORT THE SH455SW. Austin is growing very fast to the dismay of many of us who have seen the city change rapidly with new developments being built without apparent concern for water or transportation access. Growth is necessary and without careful, prudent planning, decisions that will impact our communities and our water acquifer can make a very bad situation much worse. Trying to push through SH45SW without reasonable and proper review is not in Austin's tax payers best interests! If this SH455SW is part of a much large plan to link I35 with Mopac then how can you reasonable argue this toll road will NOT have a significant impact on the community and the aquifer re-charge zone? Please act responsibly and follow environmental guidelines for Austin's future health and welfare and do NOT approve SH455SW without a careful look at it's environmental impact. Please act responsibly for Austin's and our children's future.	2014-07-24 16:45:42
Jim	Skaggs	I concur with youir 'Environmental Impact' work and your plan for 45 SW. This is a major connective link which will eventually be part of overall regional connections which will provide greatly imporoved, cost-effective mobility for all citizens. Mobility provides citizens access to better jobs and higher incomes and provides businesses higher productivity due to accessing better employees. The greater the mobility, the greater the quality of life. Just the few improved roads and connections in the past 15 years have proven this many times Thank you.	2014-07-24 16:49:40
Jose	Beceiro	Please build SH 45 SW! It's a critical piece of infrastructure that's needed today and will help manage our regional traffic congestion.	2014-07-24 16:52:26
Kevin	Brown	I consider this to be the most critical matter our area is facing today. We need this road: I understand that voters approved this project in 1997. TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. SH 45 SW will improve regional connectivity and will provide a desparately needed alternative to today's highly-congested roadways. More than 100 people move to the region every day and transportation infrastructure investments are critically-important.	2014-07-24 17:10:04

First Name	Last Name	Message	Date Created
Patrice	Schexnayder	Let's get real! Let's get smart! Adding more vehicles to an already clogged roadway is not a traffic solution! It will be devastating to a semi-rural environment which already suffers too much traffic. Why add cars and big trucks to an already crowded roadway when there are better solutions to move people. Getting around Austin via automobile is difficult, to say the least. The geography does not lend itself to massive road projects such as one sees in Houston, an area unencumbered by waters and fragile lands. Those massive Houston road projects themselves show us the limitations of autos as principle transportation. There are still clogged freeways during rush hours, terrible accidents with 18-wheeler trucks, and increased pollution - no matter how many lanes are added. Dumb! Houston is now quickly building the rails that ought to have been built decades ago. By contrast, getting around Washington DC is much easier now than it was five decades ago. A concerted effort was made to build rail transportation. People commuting from suburban areas and outlying towns, now swiftly travel to work via the Metro. During hours when there are more commuters, more railcars are put into service, and they run more frequently. The idea that each person needs an auto and a parking space 50 feet from their workplace is hogwash. In Washington DC massively wide roads were deemed a practical way to move people around. What SH45-SW would do is simply create worse traffic jams on a road that cannot accommodate more vehicles, bring stop-and-go traffic with increased pollution, and create an intolerable commute on a road that is already crowded. You build that SW segment and you might as well sell parking permits for MoPac. Spend the money on a real solution to solve the transportation needs of Travis County. This area does not need an increase in truck traffic or long-distance commuters. The road would not be adequate for more autos - solutions come only if realistic solutions that serve the people are constructed. I oppose the construction of SH45-SW!	2014-07-24 19:46:57
Robert	Gilliland	I am concerned that the study ignores the bigger issues and minimizes environmental impact. What is proposed, really, is an I-35 West that would run through and pave over critical environmental areas. In addition, there is no honest dealing with the noise, air and water pollution that would be generated by such a project. As someone who lives only a few blocks from MoPac this is very important to me and my neighbors. DOT should have an honest consideration of less environmentally detrimental alternatives and an honest, in-depth analysis of the entire project, not just of parts of it, prior to deciding what should be done. The city of Austin is looking to expand its commuter rail system, an environmentally friendly way to improve mobility. This might be a good time for DOT to do likewise.	2014-07-25 06:45:43
Rudy	Garza	History continues to prove on Mopac and I35 that the approach of "don't build it" absolutely does not work. Anyone having to drive Slaughter Lane knows that the congestion is ridiculous. SH45 will have an immediate positive impact on Slaughter Lane traffic. The argument that SH45 will put more people on Mopac and I35 is incredibly short sighted. Folks are still getting on Mopac and I35, they just have to take the long and crowded Slaughter Lane. Please proceed with building SH45. At the very least, limit the conversation to only folks that travel Slaughter Lane at least 15-20 times per week; rather than folks that are against it but rarely ever travel Slaughter Lane and have to suffer the impact.	2014-07-25 11:07:44

First Name	Last Name	Message	Date Created
Ryan	Therrell	I am writing in support of building SH 45 SW. Voters approved this regionally-significant project in 1997. It's time to follow through on this project. Many partners including TxDOT, CTRMA (Central Texas Regional Mobility Authority), Hays and Travis counties have collaborated to fund this roadway. There are many benefits to building the road including improving regional connectivity and providing an alternative to today's highly-congested roadways. More than 100 people move to the region every day and transportation infrastructure investments are critically-important, please build this road. Thank you	2014-07-25 14:31:29
Laddie	Bordovsky	I am a citizen of Kyle Texas. I am in favor of the SH45SW extension being built as soon as possible. It will help relieve the traffic that flows off Brodie Lane in south Austin.	2014-07-25 15:22:51
Mariah	Watkins	This new study by texdot is inconclusive. It does not truly consider the impact of mopac becoming I 35 west. This is being built over an aquafier!! Being built with tax payer money, 100 million dollars but the toll road is not run by the city. Why are we paying 100 million dollar to damage or environment, waste millions of tax payers money when so many other issues should be addressed. This road will ruin mopac. It is already too congested and now we are adding 30,000 more commuters a day. I am crushed. This represents nothing that is good or protective of Austin. I say no thank you to toll road sh45.	2014-07-26 07:46:13
Cindy	Symington	Having lived in Austin almost all of my 63 years, I care deeply about the future of this city. We know that traffic is untenable, and I applaud those who are working hard to come up with solutions to help relieve congestion. But I am stopped short by those who would believe that giving control of toll roads to non-local entities actually believe there could be ANY benefit whatsoever. As Austinites, we are the only ones who will consider all the tiny details that go into decision-making (and profit-sharing) as the years go by. Only those of us who live here, give here, play, work, and contribute, can and should appropriately manage a massive transportation project with knowledge of consequences and likely outcomes - with full consideration of all facets, present and future, that will be impacted by profit-driven decisions. Profit should never ever by the only motivator, and to turn over control to a non-local entity would be detrimental to ALL of us who truly care about our city, as opposed to those who would only profit. It makes NO sense to remove Austinites from the equation.	2014-07-26 10:20:36
cris	nelson	If the plan is to encourage public transit use and thus moderate gridlock, then stop enabling ubiquitous car use, and it's pollution, with more roads!! Such road expansion only helps for a short while and creates a similar, inevitable snarl on the new thruway. And a new group of protests from those affected. Letting developers dictate solutions may line your pockets but the people will not forgive stupidity. You will be ushered out of city affairs into another profession or other state. Just pretend you care for the rest of us and deny another scar upon the fragile hill country.	2014-07-26 13:14:08
Kent	Miller	The southwest extension should not be built. This is an ill conceived short-term solution to be built in a environmentally sensitive area. It's existance will only encourage more growth in an area where growth should be discoraged. Its existence will only create the same issues ,once again, years down the road.	2014-07-27 11:14:37

First Name	Last Name	Message	Date Created
Carol	Croft	Has any consideration or count been done of the residents that currently access 1626 and/or 967 to 1826 to access Mopac? It appears a significant additional number of residents that need access are not included in any of the studies published in your reports thus far. Taking MOPAC south to 967 and installing two access roads, one each from 1826 and 1626 make far more sense in the bigger picture than only addressing the needs of those in this one region east of Mopac currently using Slaughter Lane. In addition, the influx of additional traffic will create even more gridlock on MOPAC when they get to the lights on La Crosse and Slaughter. Is there a plan to remove these lights or move traffic over or under these intersections for the east/west flow?	2014-07-27 12:44:24
Carol	Croft	Has any consideration or count been done of the residents that currently access 1626 and/or 967 to 1826 to access Mopac? It appears a significant additional number of residents that need access are not included in any of the studies published in your reports thus far. Taking MOPAC south to 967 and installing two access roads, one each from 1826 and 1626 make far more sense in the bigger picture than only addressing the needs of those in this one region east of Mopac currently using Slaughter Lane. In addition, the influx of additional traffic will create even more gridlock on MOPAC when they get to the lights on La Crosse and Slaughter. Is there a plan to remove these lights or move traffic over or under these intersections for the east/west flow?	2014-07-27 13:18:46
John	Ribble	Kill 45 SW. It will in fact degrade not only the Edwards Aquifer but the ecosystem where it is built. The road is also too expensive and will NOT provide a lessening of traffic to the roads it connects to. It is an opportunity for a few to make a fortune at the expense of many, playing on the illusion that it will reduce traffic. Nothing could be further from the truth. Protect the aquifer and the ecosystem.	2014-07-27 14:53:32
Kathi	Miller	I am opposed to the construction of SH45SW. I believe it will do nothing except put 30,000 additional cars per day on South Mopac, while creating new traffic congestion on Southwest Austin neighborhood streets, while also threatening our environment. I object to the vote by a majority of Travis County commissioners to force this issue before a new commissioner and county judge, who were elected partly because of their opposition to 45, can take office.	2014-07-27 15:27:00
Pietri	Stefano	Dear Sirs, The proposed development of SH 45 SW appears to be a complete waste of our taxpayers money. 1) Toll roads are never in the best interest of people. Every economy is based on the free flow of market goods. This is just another tax that will never go away, even when the road has payed itself 100 times. The sad part is that a few will get rich "administering" the road at the expense of the rest of us, and you are not the few. 2) Instead of relieving traffic on congestion, it will simply divert more cars on MOPAC so we pay toll on toll? Interesting concept this one. 3) All the environmental studies are incomplete for a simple reason. The impact on the water quality will be huge. This is water that your kids will be drinking every day. In few words, NO THANK YOU to the proposed development of SH 45 SW! Suggestions: Build roads where they do not pollute aquifers. It is possible! More roundabouts, less lights. Traffic flows instead of sticking. Use "alternative turn left" at intersections that do not impede traffic on the other side. No tolls, they kill the economy, and that includes your paycheck. Get bigger loans instead. Smaller schools and more distributed school districts. Regards Stefano	2014-07-28 09:01:47

First Name	Last Name	Message	Date Created
Lacy	Seybold	We are in COMPLETE SUPPROT of building 45SW. It is LONG overdue and will relieve the burden on Brodie Lane that comes from all the Hayes County residents using Brodie as their access road to MoPac. Failure to build 45SW will NOT stop development south of Brodie in Hays County. That development will happen regardless of whether our leadership continues to deny its existence or not. And that development WILL make living along and using Brodie even more of a nightmare than it currently is. The EIS makes perfect sense in its conclusion that building 45SW will have minimal impact. Brodie sits on the Edwards Acquifer Recharge Zone. Therefore, traffic sitting on Brodie is NOT an environmentally friendly alternative to building 45SW. Please do NOT bury your heads in the sand--support the building of 45SW and get it done NOW. We need the road relief in SW Travis county.	2014-07-28 09:23:40
Ashley	Parsons	If SH45 is built, I endorse the building of the shared use-path and exclusion of frontage roads throughout the project's limits. Access should be highly limited to only the three outlined in the EIS. The shared use-path should connect to the Violet Crown Trail.	2014-07-28 10:41:31
Danielle	Esparza	Do not pave over the Edwards Aquifer! The environmental impact would be devestating to our most precious natural resource - our drinking water!	2014-07-28 12:23:59
Roger	Brown	Please build SW45 as soon as possible. The delays are causing increased pollution due to the stop and go traffic and delays on Brodie Lane. The growth in Hays County will continue and more effort needs to be done to keep up with it. Opposing voices talk about keeping MoPac to themselves, but the most of the Brodie traffic now goes across Slaughter of Davis Ln to MoPac now. It will only continue and will get worse. Roger	2014-07-28 12:37:43
rick	byrnes	We should take extraordinary precautions to save the environment. No more construction over the aquifer. Our water must be kept clean. Barton Spring already shows evidence of contamination. Let's preserve it for future generations.	2014-07-28 12:38:23
Cindy	Cook	NO to adding highway over the Barton creek watershed area. Barton Springs pool is the oasis of Austin, we must protect it! You know this is not the answer to the gridlock on our highways. We must protect our water, no water no life!	2014-07-28 13:41:48
Kevin	Buffington	I am incredibly supportive of SH 45SW. Please build it now.	2014-07-28 13:57:06
Daniel	Jasinski	Right-of-way land to be used was not approved by citizen voters for a tollway in the '90's. Any tolling amounts to a fraudulent bait-and-switch scheme by a self-serving consortium of backroom dealers. Tolling this land tract is a breach of citizen trust by elected officials and their conniving non-elected cohorts for their own personal gain at the expense of the general populace whose common good is suppose to be the ultimate goal. This exemplifies literal highway robbery by corrupt/ed officials and bribing co-conspirators. The false facade of improving traffic congestion has been dropped over the past decade to unveil the impetus to fatten the coffers of private exploiters, i.e. PPPs using public funding and risk for taxpayers lieu the private entities. The enviromental sutdy needs to include the entire western loop from I35 south to I35 north via MOPAC.	2014-07-28 13:57:24
Gina	Bethune	As someone who works in the healthcare industry and has seen first-hand what insufficient access for emergency workers can do, I am highly supportive of building SH 45SW.	2014-07-28 13:58:58

First Name	Last Name	Message	Date Created
Dawn	Bayarena	The draft EIS is not complete and does not look at the project in it's entirety; specifically the other parts of the MoPac expansion on the TXDOT agenda. The study is not complete and is being presented prematurely. Because the study is incomplete it fails to address some very important aspects of this project; such as noise, air and light pollution to name a few. The project appears to be very 'single minded' in that alternatives are not being given any focus. I strongly oppose SH45 SW toll road and am appalled at the blatant manner this is being 'forced' through the system.	2014-07-28 14:01:57
Kerri	Welch	As a nearby resident of MoPac and a frequent, and generations deep patron of the both Deep Eddy and Barton Springs, I am concerned the negative effects on water quality and downtown living/parking by encouraging additional traffic on MoPac corridor and in the Barton Spring recharge zone. Please consider more sustainable alternatives. Tollway 130 has not been a success. Why would we repeat a failed project when what we really need to be doing in investing in sustainable solutions like public transportation? Please seriously consider the SOS critique of the DEIS including the following: "*The draft EIS fails to consider better, more affordable and sustainable alternatives. TxDOT's analysis shows that building 45SW increases Mopac congestion. Much better ways to improve north-south commuting between Hays County and Austin include: upgrades to I-35, Manchaca, and Brodie; new bus service that currently does not exist; and subsidizing of telecommuting, carpooling, ridesharing, and other steps that reduce single-occupancy commuting. Spending $100 million to divert more traffic to Mopac makes no sense at all." Thank you.	2014-07-28 14:52:41
Stacey	Knight	Build SH 45 now. Roads are dangerous! Traffic is polluting. Thanks, Stacey	2014-07-28 15:13:53
Chris	Harkrider	To Whom It May Concern: I am a long-time resident of both Travis and Hays counties. Our family first moved to South Austin in 1965, moving to Hays County in 2006. I am a regular commuter to Austin, driving thru Shady Hollow and now 1826 to get to work in Austin (both my wife and I) While I am no traffic engineer and/or possess any credentials to allow me to assert the following, it stand to reason that SH 45SW needs to be constructed for any number of reasons as follows; - Will provide tremendous relief to those individuals daily driving from Hays County to Austin. - Will provide a needed further connection to the "outer loop" serving this greater area by connecting 130/45 and Mopac - Will allow drivers to reduce traffic on IH-35 when connecting to Austin via Kyle and the soon to be completed expansion of 1626 from 967 to Brodie Lane - While there are environmental concerns, I am confident that a road can be built over this sensitive area in the least impactful way utilizing technologies and materials not available over the last 20-25 years this road has been under "study" or contemplation - I am reasonably confident that "pollution" and impact in total is far less dramatic when complete than the countless thousands of cars daily stuck in traffic emitting toxic fumes, oils, gas, and other types of automobile emissions while stuck in traffic for hours - Makes sense as a part of a comprehensive road plan for Austin and the greater region Thank you for making this needed road a reality.	2014-07-28 15:19:58
garret	nick	i think the proposal to simply redesign the main congested intersections along mopac to improve flow is much better than spending tons of money building more highways over the aquifer. the more lanes you build, the more cars will pack on to them. the money should be invested in alternatives to single rider vehicles, that is the only real answer. i would ONLY support traffic across the aquifer if it was limited to ONLY HOV and mass transit. there is no long term value in just simply building more capacity for modes that are inefficient. do not compromise our shared natural resources to incentivize and fuel a car culture that is NOT working. thanks.	2014-07-28 15:30:22

First Name	Last Name	Message	Date Created
jay	Southworth	SH 45 SW is one of the most important opportunities for moving traffic in Austin immediately, in fact, the road should be completed and extended to IH 35 but that is another topic for a later discussion. If this road is not built very soon then this will be one of the first dominos to fall in what will be the eventual demise of Austin being perceived as one of the best cities to live in in this country. Please don't screw this up and please approve this section of SH 45 NOW! Thanks	2014-07-28 16:11:13
Gary	Mckenzie	I wish to register opposition to the expansion of I-45 as currently proposed.	2014-07-28 17:26:54
Edward	Swearingen	I am retiring near the intersection of 281 and 306. Gas prices are already so high my budget will only allow very limited travel between where my house will be and San Antonio, where my family is. The prospect of a toll road will cut me off from San Antonio as a matter of budget. If the toll road is built with current designs, using nothing but access road will also cost more in gas then I can afford. Even going to the HEB in Bulverdie will be difficult. The only thing 281 needs is overpasses. That would be cheap and less time consuming then the proposed toll roads, or super-steets.	2014-07-28 19:35:57
Mark	Rollins	We need to build this road now in order to reduce traffic on Brodie Lane and Manchaca Road.	2014-07-28 20:58:09
Thomas	Price	The real project is an expanded and tolled Mopac/45SW loop that, if built, would convert Mopac from a local commuter highway to an alternative Interstate 35. We don't want that, it would be bad for the environment and bad for Mopac users. Please stop this project, or at least do an honest environmental analysis that looks at the whole project – rather than chopping it up into four separate pieces.	2014-07-28 20:59:53
Aaron	Braud	This is a waste of environmentally sensitive state land. If we are going to have private interests control our transportation infrastructure, we should at least build a rail system that would prevent delays due to human error (automobile accidents) or surges in traffic volume. However it is high time we kept international interests out of our state. This good-ol'-boy back room deal has gone on long enough.	2014-07-28 21:54:48
Jamie	Fulenwider	I support SH 45SW. It is long overdue and needs to be done ASAP. The homeowners on Brodie need relief. The intersection of Slaughter and Mopac need relief. It's easier for those of us who live south to go to San Antonio for business than it is to Austin because of traffic. If Austin wants me (any many others in Hays Country) to keep my money going to points southward, let Austin keep being stubborn.	2014-07-28 21:56:33
Desmond	Ng	After reviewing the City of Austin City Manager's letter to TxDOT, it appears that TxDOT is not being honest and does not seem to have the interests of the community in mind. By releasing the draft EIS (DEIS) before all studies have been completed seemed like a half hearted job. Please withdraw the DEIS and republish when all studies have been completed and all alternatives have been evaluated properly. By rushing to putting more cars onto Mopac is going to improve traffic on Mopac for anyone and harms the environment.	2014-07-28 22:01:24
Sherri	Dugan	As someone who is directly impacted by the use of Brodie Lane as a commuter artery I strongly encourage you to continue the work to build SH45. Brodie Lane was never meant to handle the traffic that it is forced to handle now. It is a neighborhood street and the suggestions put forth by SOS to essentially turn it into a highway are ridiculous. SOS claims to want to protect our watershed, but the thousands of cars that use Brodie and Manchaca currently are causing an impact to the environment much more harsh than what is proposed for SH45. I wish the city council and the other powers that be would realize that you can't stop growth by refusing to build roads.	2014-07-28 22:10:15

First Name	Last Name	Message	Date Created
Jeff	Jack	TxDot Please do not accept the DEIS on SH45SW at this time. There are too many issues that this draft does not consider sufficiently such as alternative proposals for traffic mitigation. It also does not have the benefit of on going or recently completed environmental studies by other agencies. Also it does not allow adequate time for community review due to the length of the report. And finally, while it may be outside the scope of this analysis, in considering alternatives it does not assess the environmental impact of some of the alternatives proposed such as the widening of Brodie Lane. To have a complete and objective analysis for the public to have confidence in all of these issues must be addressed before a EIS is finalized. Thanks Jeff Jack Zilker	2014-07-29 05:43:40
Dale	Bulla	This proposal is not going to improve traffic but will only attract more drivers and further clog our highways. Building over the aquifer will have consequences. We have heard these reports of "minimual impact" before but those impacts are always determined to be unintended after the fact. We only have one aquifer. We must protect it. Stop this insanity.	2014-07-29 07:24:30
Bill	Meacham	I oppose the construction of SH 45 SW because it poses a danger to the environment. At the very least, withdraw the Draft Environmental Impact Statement to get further input from studies which are not included in the DEIS.	2014-07-29 08:42:40
Timothy	Jones	Please build SW45. I can't attend the hearing tonight but I wanted to ask that the road be built. It's clear that we, the people, want it and the community needs it. Please don't let politics continue to drag it out any longer. Thanks!	2014-07-29 09:13:15
Linda	Kneeland	Please record that we need to approve and build SH45SW as soon as possible. We live on FM 1626, and with the escallation of traffic and the need to shorten the commute time between FM1626 and the end of MoPAC, contruction of SH45SW is the answer. This project has "been on the books" and is way overdue! Thank you. Linda Kneeland	2014-07-29 09:26:06
Robert	Kneeland	Environmental Impact issues are inconsequential compared to the necessity of movement of traffic flow for the route of SH45SW. Build it NOW! Project has been "on the books" for too long! Thank you - Robert Kneeland	2014-07-29 09:28:25
Larry	Akers	One morning around 7:30 in March, radio announced a traffic accident with lane closures on northbound IH-35 near 51st Street. Normally, northbound morning traffic flows more or less smoothly on Mopac north of the river, and at highway speed after 9:00 or 9:30. At 11:00 that morning, northbound Mopac was still stop and go, for no other reason than northbound commuters changing their route from IH35 to Mopac. SH45 SW is part of the plan to connect IH 35 to Mopac. When this is done, Mopac will become the reliever for IH-35. It is currently at or above capacity. The major project to add a toll lane will exhaust its available right of way. The additional load induced by SH45 SW will be the tipping point for Mopac. The cost of SH45 SW is not its meager construction budget; it is the billion dollar problem that will be foisted on the region's second most critical roadway. Add to this the environmental degradation that will result, both from groundwater problems brought on by enabled development and from airborne pollution brought about by the induced congestion on Mopac. SH45-SW will make the fiasco of that March morning a fact of every day life on Mopac. If you want to break the back of transportation in west-central Travis county and west Austin, then build it. I do not think you should. It is a bad, fiscally irresponsible, environmentally irresponsible plan. Please abandon it.	2014-07-29 11:26:32

First Name	Last Name	Message	Date Created
Andrei	Lubomudrov	Please support including a shared-use bicycle and pedestrian path in the preferred alternative for SH 45. Constructing a shared-use facility alongside this project will help enhance mobility options for Austinites and is key to improving bicycle and pedestrian connections in the long-term. I appreciate that TxDOT has recently taken strides toward embracing a multi-modal approach to congestion relief in urban areas. I hope that SH 45, if constructed, will advance this multi-modal vision and take Austin a step closer to offering the well-rounded mobility options residents deserve.	2014-07-29 14:21:26
Bo	Kidd	This is desperately needed and long overdue.	2014-07-29 15:09:18
Daily	Commuter	The southbound traffic on Brodie Lane turning onto FM 1626 was backed up to Frate Barker Road(Distance of .7 miles) yesterday. Enough Said!	2014-07-29 16:01:27
Kevin	Todd	Build 45 now---we've waited long enough. Build it as environmentally friendly as can reasonably be done, but build it!	2014-07-29 16:04:32
Michael	Fry	I support the extension of 45 to FM1626. As a citizen of Hays County who commutes to Austin, the extension will save me time and money. Thank you, Michael Fry	2014-07-29 16:59:17
Gayle	DeCesaris	Please build SH45 SW I favor the plan with 4 12ft travel lanes, 1 10ft outside shoulder, a 4ft inside shoulder, and a 10ft multi-use pathway. Thank you.	2014-07-29 17:57:36
Craig	Cannon	Questions 1) when would construction start and how long to complete the project. 2) which law enforcement and fire agencies would be primary responders to the toll area not in the city of Austin. 3) with increased traffic from the new toll road being placed on mopac what are the plans for mopac@lacrosse & mopac@ slaughter. Those locations are already very congested? If something is planned what funding exists?	2014-07-29 18:47:21
Pauline	Tom	Strong proponent. I cannot get to the Hearing this evening. Did not realize it started so early. Please get it built as quickly as possible. We avoid trips to Austin, opting to go to San Marcos when there's a choice because of congested Brodie Lane.	2014-07-29 19:02:16
Pauline	Tom	It appears anyone could launch a nationwide appeal prompting emailed feedback to you on this matter, since residency is not a requirement.	2014-07-29 19:05:00
Ken	Rigsbee	I am pleased with the intended design of SH 45 SW. I think it will serve the needs of the public far better than Brodie Lane and any other combination of Manchaca Road, FM 1826, etc. FM 1626 will be overloaded through Manchaca and over to IH-35, however. Nonetheless, this is very positive because I remember it first being discussed and planned in 1985.	2014-07-29 19:35:12
jeffrey	solomon	Let's not give 18 wheelers a closer way to bypass Austin than the east toll road. Mopac is overcrowded as it is and having 18 wheelers on the road will make it more crowded as well as more dangerous.	2014-07-29 20:21:47

First Name	Last Name	Message	Date Created
Doug	Ross	If one stood at the intersection of FM 1626 and Brodie Lane from 6:30AM to 9:00AM and from 4:30PM to 8:00PM any week day, they would observe a large volume of east bound vehicles turning north onto Brodie Lane from FM 1625 in the AM and an equally large volume of vehicles are turning west from Brodie Lane onto FM 1625 in the PM. Per Campo, in 2011 12,500 average daily trips (ADT) are shown on Brodie Lane at FM 1625 and 27,000 ADT are shown on Brodie Lane south of Slaughter Lane. About 45% of the traffic on Brodie Lane travels from FM 1625 onto Brodie Lane and Brodie Lane onto FM 1625. Since most retail and business are north of Shady Hollow, I think it is fair to say that at least 90% of the traffic that makes up the 12,500 ADT would be taking SH 45 SW if it were built. By 2017, the City of Austin projects the average daily trips to be 42,500. Since there is little open space in that area to build more homes, most of the added traffic would be coming from Hays County and would be using SH45 SW if it were built. The construction designs appears to address the environment concerns and since there is a tremendous need, I urge SH45 Southwest to be built ASAP.	2014-07-29 21:38:55
Lisa	Laird	The rush to force through an incomplete EIS and build SH 45 Sw is completely for political reasons. You are not considering the noise impact to the residents even beyond the connection to Mopac where many more additional cars and trucks will pass by. These excess trips will cause noise and safety issues for the entire area. The only ones benefiting from building this road are the people living in Shady Hollow and the commuters coming into Austin from Hays Co. Why is Travis Co trying to force this down the taxpayers throats? You need to consider all impacts and help spread the cost of any improvements equally throughout the area. You are just going to create a bottleneck of congestion and safety issues to both vehicular and bicycle traffic along the existing Mopac/45 corridor.	2014-07-29 21:41:14
Rion	Ridley	I believe that protecting our natural resources is very important! there are plenty of other places to build these roads and we should focus on making the roads we have more efficient instead of just building roads until the entire Austin area is covered in roadways and polluted water..... Please protect our environment and water resources by finding another route to take this highway project. thank you.	2014-07-29 22:36:35
Charles	Jones	In order to protect as many trees as possible, particularly large trees, a tree survey should be completed throughout the corridor prior to completion of the final design. The final design of the roadway and trail should attempt to minimize the number of large trees that must be removed. Trees provide important water quality benefits, as well as being a culturally significant resource. Large hardwood trees are particularly important to the region and a tree survey is necessary to determine their locations and minimize impacts.	2014-07-29 22:45:30
rebecca	cote	I stand against the I45 tollway that would go through Edward's Aquifer. Please find other solutions to the growing traffic in Austin. The delicate nature of the environment and freshwater should not be put at risk of pollution due to development. Thank you, Rebecca	2014-07-29 22:52:03

First Name	Last Name	Message	Date Created
Beki	Halpin	Regarding 45SW: The Draft EIS does not consider the entire project, which will really include MOPAC which will become part of the project when it is completed. The EIS should include the entire finished project, including the impact on Mopac The EIS does not include critical studies of sink holes and caves and the impact of run off into the aquifer. These studies are not complete and are critical to the evaluation of the project. THIS PROJECT AND EIS IS BEING RUSHED. The EIS should not go forward until the studies are completed. How can the public comment on the project's environmental impact when no one knows what it will be???? Cumulative impacts are not studied and cannot be evaluated by the public. Light pollution, noise, engendered development, air pollution, and water pollution will all be increased. What will be the effect of these on the community and will the negative effects of these far outweigh the sprawl inducing effects of this highway? What alternate routes, transit proposals, highway and road improvements could be built instead of this expensive project that would generate effective transportation benefits with many fewer negative side effects? These need to be explored. This project will bring many more trucks and cars to Mopac helping to reduce the air quality and increase sound pollution in west Austin. This project will turn Mopac in to a wester bypass of Austin for trucks. This should be considered for the entire project in the EIS. The most important resource we have in Austin right now is water. There are plans for the water in the aquifer under this project to be available for drinking by the citizens of Austin. If this project pollutes this water, we will not be able to clean it up to drink it. Drinking water is much more important than a bit of transportation sprawl inducing roadway. This road imperils our drinking water. This EIS is being pushed through too fast with unfinished scientific studies regarding water quality and little attention paid to alternative that will be environmentally safe.	2014-07-29 23:03:37
michael	hooks	I would like to propose a change to the proposed SH 45 SW interchange toll-road in front of Grey Rock Ridge subdivision via intersection of Archeleta Blvd., Mopac North, and SH 45 SW intersection. In a few years from now, our new subdivision will have over 400 single-family homes built in it, and I'm very concerned about the current plans for the interchange and how it will continue to cause problems for our community. According to the drawn-schematic layout with the new toll-road place, there is still: 1. No direct way to get onto Archeleta Blvd. from South-bound Mopac. Instead, one has to continue to go down South-bound Mopac, then merge onto SH 45 SW west-bound, then make a U-turn at Escarpment, and then go back up SH 45 SW east-bound, and then take Archeleta Blvd. before it turns back up into North-bound Loop 1/Mopac. 2. Folks will be continuing to drive 70 mph until they come to the hard 90-degree turn right in front of Archeleta Blvd. where SH 45 SW east-bound turns up into North-bound Mopac. The approximate location of the Archeleta/Mopac/SH 45 SW intersection is: 5605 Texas 45 Austin, TX 78739 30° 10.365', -97° 53.340' I am making this request because I am seeing too many accidents occur at this intersection for drivers going east-bound on Hwy 45 and then north-bound onto Mopac. I have only seen two accidents happen directly, but I know that many other accidents have occurred there. Drivers sometimes do not heed all of the warning signs for the approximately-90-degree turn, and are running off of the road, and going straight across our neighborhood exit. I am concerned for the safety of anyone who leaves our neighborhood, for the fear of getting 't-boned' while coming out of our neighborhood, from a driver who is not paying proper attention to the 'road is curving' signs. I	2014-07-29 23:24:35

First Name	Last Name	Message	Date Created
		myself was almost 't-boned' last week in broad daylight in perfect weather conditions. Fortunately, the driver who missed me is ok, but from the looks of it, their vehicle was practically totaled.	
John	Crane	The way Austin is currently laid out, most of the destinations for work and shopping are located along Mopac. Therefore, it is critical to have easy access to Mopac from throughout the city. We keep hearing about Hays county access to Mopac, but we live over by Akins HS and have to travel to Mopac to access these destinations. Our little area is growing rapidly, and when I-35 is choked, as it usually is, and Slaughter is choked, we can't get out of the area. I'm tired of feeling like a hostage in my own home. 45-SW would provide a much-needed EW route for us to access Mopac. I am in favor of SH-45SW, and also in favor of completing the complete SH-45 route down to IH-35.	2014-07-30 05:28:44
Mark	Thomas	We urge you to SAY NO to this project for the environmental reasons, due to the sensitivity of the wetlands in the projected path of this stretch of land. Thank you , M. Thomas Austin TX	2014-07-30 06:40:08
Greg	Deal	I live at the above address, and drive Brodie Lane to Mopac, each morning. The traffic coming up Brodie, from Buda, is becoming more and more ridiculous. Even more ridiculous, is the fact that this road is taking 20yrs to build and is now being blocked by wacko environmentalists. It seems to me, that if there were more roads and better access to points of destination, this would actually help the "environment" by eliminating heavy traffic from sitting in idle on limited streets. The letter to TxDot from Mark Ott, Austin City Manager, is ignorant and politically motivated. I ask that this request by the great and almighty City of Austin leader, be emphatically ignored. Build the damn road, now. I'm tired of the Sierra Club and other nuts over-ruling common sense and practicality. Otherwise, maybe we should stop telling the world how wonderful Austin, TX is, because it is getting over-crowded on our streets and will just get worse and worse in the next few yrs, and trains will not fix anything. Again, build the damn road, now.	2014-07-30 08:06:59

First Name	Last Name	Message	Date Created
michael	hooks	Hello. My name is Michael Hooks, and I received your contact information from Mike Mikisic (I might have mispelled his last name). I am writing to you to request a formal traffic assessment of the highway intersection of East-bound Highway 45 and Northbound South Mopac Expressway in SW Austin near Circle C. It's located near the Avana and Greyrock Ridge communities of Circle C. I would like to propose a change to the proposed SH 45 SW interchange toll-road in front of Grey Rock Ridge subdivision via intersection of Archeleta Blvd., Mopac North, and SH 45 SW intersection. In a few years from now, our new subdivision will have over 400 single-family homes built in it, and I'm very concerned about the current plans for the interchange and how it will continue to cause problems for our community. According to the drawn-schematic layout with the new toll-road place, there is still: 1. No direct way to get onto Archeleta Blvd. from South-bound Mopac. Instead, one has to continue to go down South-bound Mopac, then merge onto SH 45 SW west-bound, then make a U-turn at Escarpment, and then go back up SH 45 SW east-bound, and then take Archeleta Blvd. before it turns back up into North-bound Loop 1/Mopac. 2. Folks will be continuing to drive 70 mph until they come to the hard 90-degree turn right in front of Archeleta Blvd. where SH 45 SW east-bound turns up into North-bound Mopac. The approximate location of the Archeleta/Mopac/SH 45 SW intersection is: 5605 Texas 45 Austin, TX 78739 30° 10.365', -97° 53.340' I am making this request because I am seeing too many accidents occur at this intersection for drivers going east-bound on Hwy 45 and then north-bound onto Mopac. I have only seen two accidents happen directly, but I know that many other accidents have occurred there. Drivers sometimes do not heed all of the warning signs for the approximately-90-degree turn, and are running off of the road, and going straight across our neighborhood exit. I am concerned for the safety of anyone who leaves our neighborhood, for the fear of getting 't-boned' while coming out of our neighborhood, from a driver who is not paying proper attention to the 'road is curving' signs. I myself was almost 't-boned' last week in broad daylight in perfect weather conditions. Fortunately, the driver who missed me is ok, but from the looks of it, their vehicle was practically totaled.	2014-07-30 09:15:38
Michelle	Reinhardt	I oppose development of SH45SW due to safety and environmental concerns. This project will bring more accidents, pollution and traffic to a sensitive part of the city. Mopac is already a parking lot and this extension will bring thousands more cars to it daily. This road should not be built.	2014-07-30 09:25:43
Susan	Anderson	Looking at the schematic, Archeleta (the only entrance and exit from Grey Rock Ridge) feeds into a curve on the road and will be dangerous for the 400+ families that will eventually live in this neighborhood. Please give us a safe entrance/exit.	2014-07-30 09:58:17
Linda	Briscoe Myers	This is a nightmare plan that will only save Hays County commuters 3 minutes and dump 30K more cars on Mopac, which is already a parking lot.	2014-07-30 10:01:38
Erica	Brennes	Why not build the South MoPac Project first? To avoid at North MoPac/Hwy 183 interchange situation? I'm all for new construction, but I think this will hurt South MoPac traffic significantly.	2014-07-30 10:01:58
Mike	Tenorio	Do we really want to build across the aquifer? Will we 15 years from look back and know we were foolish to build this road. 45SW will eventually be build all the way to I35 with 18 wheelers running through our most critical water resource. I vote to stop the project and let's find a modern day solution. Build a rail from northern Hays. Why are we moving a traffic issue from one part of town to another anyway?	2014-07-30 10:16:31

First Name	Last Name	Message	Date Created
Burnett	LaChance	As a daily driver on the existing portion of 45 and south MOPAC I can't raise an objection to making traffic flow better. My main concern is making sure that the southern end of MOPAC is completed in conjunction with 45. Traffic in the morning at the intersections of MOPAC, LaCross and Slaughter if you're traveling northbound on MOPAC is already bad enough. I can't imagine what it would be like if you added ANY number of cars. Please make sure MOPAC continues as a highway (overpasses at Slaughter and LaCross) or don't you bother doing 45. All you would be doing is moving the traffic snarl a mile west off Brodie onto south MOPAC.	2014-07-30 11:58:18
Phil	Landrum	The SH45 SW has been delayed and delayed... Environmental Studies until we are weary!!! It is time to stem up and FINISH THIS Project... For heavens sake, FINISH IT ALREADY!!!	2014-07-30 13:00:41
Jennifer	Voss	I am adamantly opposed to building SH45 SW and ask that CAMPO remove this proposed highway from their long-term plan. Reasons include: The Environmental Impact Statement (EIS) does not fully & wholly analyze all portions of this project (including the Mopac/Slaughter and Mopac/LaCrosse intersections & expansions of So. Mopac from Slaughter to Lady Bird Lake to Cesar Chavez). MOPAC should be kept for local traffic / commuters and not made into another I-35! I avoid I-35 if at all possible and Mopac is my commute method, if not surface roads. I-35 connecting with Mopac is a traffic disaster! The draft EIS has not completed studies of environmentally-sensitive features such as caves, sinkholes, & aquifer recharges. This draft EIS fails to analyze impacts & does not evaluate alternatives. Isn't that what it is intended to do? ***A huge sinkhole developed in the Arbor Trails shopping Center off Wm Cannon & Mopac years after it was built. Luckily, no lives were lost but it opened up a gaping hole that fed to the springs. Tests showed that dye traveled 1.3/mi per day at a minimum from the sinkhole to the springs*** http://www.bseacd.org/uploads/Dye%20Trace%20Arbor%20Tr_FINAL.pdf This area is full of caves and it is irresponsible development to go forward with a project such as this. We request that you withdraw this draft EIS and republish it when the EIS is truly completed. To not do so is a violation of TxDOT rules and makes a mockery out of the public comment process. We are also opposed to the various pollution effects that will take place in this neighborhood and preserve area, including the Lady Bird Johnson Wildflower Center. Conservation of these public lands should be taken seriously. I cannot imagine all the negative effects of this proposed highway. The traffic increases will be life-changing to residents in this area and will not help us but will hurt our environment, quality of life and home values. TxDOT should study the effects resulting from such a highway & honestly show what all the homes, the Wildflower Center, the public parks and the schools will have to endure if it is built. (air, noise, light and visual pollution). Better alternatives to building this highway are: improving I-35, Manchaca and Brodie, and other North/South arteries. Other solutions are to invest in public transportation rather than building more and more roads for single commuters. It is not wise to pull the massive interstate traffic that normally takes I-35, which includes heavy trucks and commercial traffic, into and through a predominantly residential and parkland space . If TxDOT is certain this is a win-win solution, then TxDOT should not be hesitant to complete this study and address all areas and provide the real results to the public. Thank you for not pushing something through that has not been vetted well enough and has the potential to create so many negative and irreversible consequences.	2014-07-30 13:06:47

First Name	Last Name	Message	Date Created
Garner	Stoll	Dear Texas Department of Transportation staff, I attended your open house and presentations at Bowie High School last night. I promised your project engineers that I would submit comments regarding your proposed design. First, let me tell you that I was pleasantly surprised at the quality of your proposal. I view it as a much needed regional connection and with this excellent design I think it should be constructed as soon as possible. I have a personal interest in the project. My wife and I own a home in the Shady Hollow area and we are frequently inconvenienced by congestion on Brodie and Slaughter lanes. In February I retired from a 40 year career as a city planner. From 2007 until my retirement I was working as Assistant Director of Planning and Development review with the City of Austin. My responsibilities with the City of Austin included overseeing the completion of the Imagine Austin Comprehensive Plan. Before coming to Austin I served as City Planning Director of a number of jurisdictions including Oklahoma City, Oklahoma, Boulder, Colorado, and Lincoln, Nebraska. In those jobs I found myself supporting positions frequently at odds with Departments of Transportation and it feels good to be able to send these supportive comments to TxDOT. I am sure that you have been made aware of the fact that this project was debated during the Imagine Austin process and is not recognized as a proposed roadway on the adopted plan's "Growth Concept Map" or related maps. Putting the plan together was a long and complicated process that involved thousands of Austin Citizens. The SW-45 connection was discussed throughout the process and I believe Imagine Austin participants were about equally split between opponents and proponents. Unfortunately the project's long and emotional history prevented a logical or rational discussion of its future range of alternatives or its benefits versus challenges. The opponents engaged in what I would call "political theater" (many of their well-worn scripts obviously written in previous decades) to successfully pressure the Mayor and City Council to remove the "line" and explanatory text representing SW-45 from the plan. The proponents, lead by the Austin business community, organized an extensive letter writing campaign to keep the "line" and text in the plan. The one exception to this was the report that was generated by an interdepartmental team of City of Austin Staff that recommended showing the alignment as a "dotted line" pending the environmental assessment. The staff's reasoning was that the existing acquired ROW represented an important potential regional connection across land with rich environmental resources and that the environmental process should guide what (if anything) should be constructed to implement this connection. I promised you some comments about the proposal: 1) I was happy to see that you were proposing an at-grade roadway with limited vertical construction. I hope you stick to that design as it is appropriate to this highly scenic/environmentally sensitive context. 2) Since north MoPac is presently under construction and since it adds bus lanes and multi-use paths along North MoPac, SW-45 should be viewed as an extension of that system. This could be facilitated by moving the multi-use path to the east side or including it on both sides. The existing MoPac shoulders are heavily used by bicyclists. This usage will undoubtedly increase with the construction of the bridge (this is a funded project) across the Barton Creek Green-way. A separate multi-use trail is needed for safety and convenience for bicyclists for the entire distance of Mopac. 3) This roadway traverses a particularly scenic stretch of the region and signs and billboards should be strictly prohibited. 4) I only read the executive summary of the EIS. Does the full report discuss the environmental tradeoffs between potential air and water pollution in its broader regional context? Thank your for your hard work. Sincerely, Garner Stoll AICP 512-351-1232	2014-07-30 13:28:30

First Name	Last Name	Message	Date Created
Shelley	Siracusa	Please proceed with building SW45. Sooner rather than later. It is a badly-needed piece of infrastructure, the environmental protections are sufficient, and as the region continues to grow, the need will only become greater. Please. Build it.	2014-07-30 13:45:09
Larry	Odom	Please do not delay this project any further. The sooner we can get the road open, the sooner we can remove this idling traffic off of the sensitive and unprotected area along Brodie Lane the better. It will be much more environmentally prudent to allow this traffic to zip across this area quickly on a road with modern environmental protections. The traffic is already there to support this project, we just need to get it off of Brodie and Slaughter and onto SH45 SW. If there is any way this could be converted to a free road instead of a Toll Road, please pursue that option, but in either case do not delay this project any further.	2014-07-30 13:51:00
Susan	Pantell	I would like TxDOT to withdraw the DEIS until the environmental studies related to this project are completed, so that the environmental assessment is a comprehensive analysis that takes into account that information. Alternatives other than a 4 lane freeway were not adequately evaluated. I do not think that building a freeway in this location is a good long-term alternative. TxDOT and local planners should look at alternatives that reduce the volume of traffic and provide more options like better transit. Since this project is directly connected to the planned expansion of Mopac south of Lady Bird Lake, the environmental impacts of both projects need to be considered together. In addition, the impacts from the second phase of this project, a connection to I-35, should be included in the analysis because by breaking the project up into sections, TxDOT would not be considering the cumulative and comprehensive impacts.	2014-07-30 14:20:04
Ken	Bresnen	I had to miss the meeting yesterday. Will you post the presentation slides and/or a summary of the presentation? Is there a planned start and finish date declared yet? If nit, when will the final decision be official? Best Ken Bresnen 512-293-3275	2014-07-30 14:31:34
Gayathri	Hariharan	SH45SW should have been build 10 years back ! We moved into Austin 5 years back and without knowing the history of SH45, purchased a home in the Estates of Baurele Ranch. Only after we purchased we realized the nightmare situation on Brodie. Having lived in other cities like Houston, Dallas, Phoenix etc, its amazing that a 3.6 mile stretch can cause this much of an issue. Yes, I understand the HUGE environment concerns, but I think thats just a farce. Reason is that housing permits are being granted EVERY DAY south of Brodie. If folks were so concernec about environment, how about doing a study of the impact of the 300,000+ cars projected to commute northwards in the future years. Brodies has hundreds of home, 2 schools, and rain water crosses Brodie in 2 places. How about a study detailing the effect of 200% increase in Hays county affecting Brodie lane. But no, no one cares about that. This notion of having a local Mopac (State owned freeway) is nauseating. Roads connect people, improve trade, improves quality of life, spreads traffics and in general is a win win situation unless you happen to be in an "Exclusive" community that might not be that exclusive after the road construction. End of day, the choice is between destruction of a beautiful cozy neighborhood and routing traffic through a state freeway. If choice is made not to build it, I too will sell my home and move elsewhere (like my 3 friends) and slowly but surely an entire community would have been devalued due to political games of a bigoted few. Local Mopac is an oxymoron. Lets keep Brodie Local. Build SH45SW	2014-07-30 15:09:19

First Name	Last Name	Message	Date Created
Eesha	Hariharan	Build SH45SW. Traffic on Brodie is an insane levels. There are 2 schools in that neighborhood, it is not a state highway, so please dont use it like one.	2014-07-30 15:10:50
Joshua	Parten	Hello: I just wanted to comment and point a couple items out that I have not seen mentioned in any of the media back and forth between those for or against the SH45SW project. I will be clear in the fact that I am certainly for the project, but a good part of my reasoning is because I care about the environment. Most, if not all of the opponents to this project are unaware that the lack of adequate roads and highways in south Austin is destroying our air quality. Traffic congestion (not free-moving traffic in highways and roads), is the largest cause of air pollution in central Texas. The area of Brodie lane that runs through Shady Hollow every morning and afternoon is filled with air pollution and also happens to be the most popular times of the day to go out for a run or to walk the dog. Reducing Air Pollution needs to be at the forefront of the case for SH45SW. Here are some articles and studies done as it relates to traffic congestion and air pollution: http://www.hsph.harvard.edu/news/hsph-in-the-news/air-pollution-traffic-levy-von-stackelberg/ http://www.ehjournal.net/content/9/1/65 http://www.sciencedaily.com/releases/2013/10/131021131002.htm	2014-07-30 15:14:48
Indradeep	Sen	Please build SH45 and give us a reason to live in the Southwest Austin region	2014-07-30 15:48:42
Maryann	Riordan	Please Build SH 45SW now, and stop all of the traffic on Brodie Lane. Another environmental study re-states what has already been found - SH 45SW being built will be better for the aquifer, traffic and the environment, so please build what we were promised years ago. Thank you.	2014-07-30 15:59:15
Danny	Villarreal	Please move forward with the proposed plan for SH-45. I live off of 1626 in San Leanna and the traffic is horrendous. This needs to be part of an aggressive approach to refactor Austin's options for commuters and specifically the population of south and southwest austin. Thanks, Danny	2014-07-30 16:54:32
Stac	Duff	I encourage you to build it! I have lived in North Hays county for almost 15 years and have worked in Austin the whole time. I enjoy living away from the city, but I work and spend money in the city. I have lived in the Austin Are since 1983 and have seen the area grow and grow. I like the green spaces and I like the fact that Austin and TxDot are watching out for our water and our way of life. However adding SH45SW is vital in the area's continued growth. I have followed this project for many years and I believe you now have studied enough and its time to build. I do have two concerns and those are the loop at the entrance from Mopac to SH45SW south bound and the intersection at 1626. Both of these will be the site of many fatal accidents in their current design. I know bridges and fly-overs are expensive, but I ask you what life is worth? Would you want your children sacrificed on a slick roadway that could have been designed a little better? Please reconsider these two areas and build it now. Thank you, Stac Duff	2014-07-30 16:58:01
Catherine	Bell	I live in Circle C and I am opposed to the expansion of 45. Please consider other, less environmentally unsound and less costly alternatives to the HAYS COUNTY and Brodie Lane traffic problems. We don't need to spend millions and millions on this road to save a few minutes' commute for a few hundred vociferous residents. They can A. get up earlier. B. leave later. C. move.	2014-07-30 18:00:12
terri	zearfoss	please built sh45sw for southwest travis /hays county	2014-07-30 19:20:42

First Name	Last Name	Message	Date Created
Amy	Mills	I am against this SW 45 toll road and do not want it built over environmentally sensitive land! Period. Close off the end of Brodie at 1626 and let Hays County take 35 into town. Another option toll an entire upper deck on 35. Stay away from environmentally sensitive land!! Mopac belongs to Austinites only!!!	2014-07-30 19:27:57
Teodora	Pogonat	I unfortunately could not make it to the open-house at Bowie HS last night due to issues with my back, but am glad that comments are opening up online that I may voice my serious concerns over the SH45 project. Through another neighbor, I saw the proposed interchange schematic for SH45 at Mopac. I have to say I'm incredibly disappointed at the lack of proper thought for the interchange in terms of engineering and also in terms of the impact to the community. Grey Rock Ridge homes and the Avana homes communities will be seriously impacted by this interchange. There are serious accidents occurring on SH45 and Escarpment due to high-speeds and poor visibility. With this interchange, there will be no way to install any kind of traffic light or do any kind of traffic mitigation at that intersection. In terms of engineering, the lack of thought is that Archeleta (the only access point for Grey Rock Ridge home community) is on the curve of the interchange. How exactly are people going to be able to get in and out? How exactly are people in Grey Rock Ridge and Avana going to be able to access other parts of Circle C, the community that they are a part of, without having to pay a toll? The communities in that area only have one in and out and that is on SH45. Making SH45 a toll will essentially mean that they have to pay every time they step outside of their homes. They do not have any other way to go and the lack of planning on TxDOT's side is a serious burden to people living in that area. PLEASE for the sake of the residents in those communities, PLEASE plan a little better for both engineering and impact to the community. The amount of noise that the interchange will create, the lack of access for entry/exit for those communities and the taxation burden for just exiting the community is a huge issue and clearly not addressed.	2014-07-30 19:31:03
BERT	GARZA	First, I am thankful that TxDOT has been very open and willing to accept public comment on the SH45SW plans. However, I believe that as a resident of southwest Austin and now Buda, this project should have been completed long ago. The situation is absolutely dire for those of us in this area. Twenty years ago, I could drive from suburbs east of Houston all the way across Houston in about 25 minutes. Today, I can barely get to downtown Austin from Buda in about an hour, sometimes an hour and a half. It borders on insanity to ask those of traveling to FM 1626 to travel down Brodie Lane daily. I've frequently sat in traffic through several light changes at Brodie and Slaughter, on each segment of that intersection. The time to start building was yesterday, and the time for this road to be open was yesterday. Having lived in north and central Austin, I did not experience this level of lack of infrastructure. The plan for SH45SW is more than just a road to help commuters, it just stands for common sense that we would have this infrastructure in place. I have read the environmental studies and cannot fathom how one small stretch of road will have more of an impact that other major roads in the area. I see this road as a net gain for the environment, in that it will offload traffic from other roads that were never designed to support it. The status quo is much more unfriendly to the environment than this project. Please build this road as soon as possible.	2014-07-30 19:59:59
Don	Primosic	I understand the position of the people of Shady Hollow (terrible traffic in theirneighborhood) and the councilperson representing that area. (wanting their votes). I also understand (since I am a civil engineer with over 40 years experience as a consultant including working with COA) reduced travel	2014-07-30 20:43:22

First Name	Last Name	Message	Date Created
		time between 1626 and MoPac. However, the majar traffic snarl is MoPac North from Slaughter to downtown, not getting people from Shady Hollow to MoPac. That is a very local issue while the other effects everyone traveling to downtown and further north on MoPac. Shouldn't MoPac from Slaughter north be improved first? Otherwise you will just be getting travelers thru Shady Hollow or I-35/1626 quicker to add to the conjestion. Also 1826 will be majorly impacted with increased traffic and it can't handle current traffic. It needs improved first also. The Loop 45 beyond 1826 should be brought back to the front burner as a partial solution to the master plan in SW Austin. Are answers to these issues that I bring up anywhere in the Env Study or elsewhere. Please respond. Thank you.	
Lisa	Glenn	I live on the corner of Brodie and Twilight. During the school year, the traffic starts to back up at 6 am when my husband is leaving. If I leave the house after 7 am, it can take me 30 minutes to go the 2 miles from my house to Slaughter. Widening 1626 to allow more cars to access Brodie is not the answer. Adding subdivisions at 1626 will only bring more cars through my neighborhood. We need relief from the congestion.	2014-07-30 20:46:44
Heather	Corbett	I live in Circle C and am absolutely against this plan!	2014-07-30 22:14:08
Melissa	Bentley	I am vehemently opposed to the building of SH 45, so that it connects FM 1626 to Mopac. I have serious concerns about the impact it will have on Mopac traffic, as it becomes a cut-through for people traveling on I-35 to downtown. It seems that this has already begun with the road being constructed to bypass downtown Buda. I am also concerned that it will not provide the relief expected by those in Shady Hollow and further south on Brodie Lane.	2014-07-30 22:29:52
BeccA	Lusk	Does 45 really have to open up to 35? What's the point. What was the point of sh-130? To alleviate traffic on 35. I don't want this to happen. I love one block off mopac in circle c. I can see mopac from my house. It's going to be very loud and dangerous for this 45 opening to happen!!! We also have a huge hike in vandalism and crime in our area lately. This will make it worse. Please let's keep this side of town quieter and more peaceful and organic. It's just too much.	2014-07-30 23:31:51
Deanna	DeHaven	The proposed plan to connect SH45SW is not a smart move for Travis county. The cost and disruption of the construction is not worth the benefit. The individuals benefiting from the change would only save a few minutes at most while this change would drastically damage our environment, put significant more traffic on MoPac, and lower property values of surrounding neighborhoods. Additionally, the cost carried by Travis County is far too high to justify the construction.	2014-07-31 07:03:20
elizabeth	harkey	We in southwest Austin are terrified of the impact (no pun intended) the SH 45 proposed plan has on our neighborhood and community. Please reconsider this project!	2014-07-31 08:40:09
Mark Thompson	Thompson	Please do not build this road, it's short sighted and will not benefit anyone in the end but Gerald Daugherty.	2014-07-31 08:47:13
Ritu	Sen	Pls. Build it soon so that we can peacefully live on Brodie.	2014-07-31 08:48:00
Jeff	Latus	Please build the extension. Thank you!	2014-07-31 08:48:41

First Name	Last Name	Message	Date Created
Lydia	Blankenship	I am very excited to have the SH45 extension. Living in Buda, I travel to St. David's South Austin Medical Center every day for work, and am always trying new routes to find one that is less congested and decreases my travel time. Traveling down Manchaca, South 1st, Brodie, etc is concerning as we all pass through the school zones. As the Trauma Manager for my facility, I am concerned with injury prevention and see these areas as potentially dangerous as the increase in traffic continues. Pedestrians and cyclists fill these streets, increasing the potential for crashes and injury. I encourage the law makers to take these things into consideration, and to consider the lives that will be saved and the decreased incidence of injury to the residents and school children if this extension is built. Thank you for your time, Lydia Blankenship, BSN RN Trauma Program Manager Concerned Citizen	2014-07-31 08:57:08
Mark	Beto	Many of the people who live in southwest Austin, such as in the Circle C Ranch development, have the following concern: There is a pending MOPAC enhancement project that involves the construction of two underpasses at the MOPAC intersections of (1) Slaughter Ln and at (2) La Crosse. This is a very good project, as these intersections are becoming what the MOPAC intersection at William Cannon used to be. The concern is that if this project is not completed before the SH45SW project, MOPAC will become a parking lot south of the Slaughter intersection. Please address this concern. Thank you for your service.	2014-07-31 12:55:01
Josh	Katz	I'm strongly opposed to SH45SW for environmental as well as practical reasons. Travis County is going to foot almost the entire bill for a road to nowhere that only shaves a few minutes off existing Hays County commutes, while inducing more intensive sprawl and traffic in Hays County. This road is a giveaway by Travis County taxpayers to developers and construction firms, and will only bring traffic and pollution to southwest Austin. I know it's a done deal and that this feedback is futile. But maybe some combination of new elected leadership and/or a lawsuit will prevent this unnecessary boondoggle from getting built. One can only hope.	2014-07-31 12:57:39
CC	Buda	Doesn't it seem like it is just creating another problem by dumping the traffic outside 3 other sub divisions in hays county? Why not a straight shot to 967 from mopac?	2014-07-31 13:49:23
Paul	Trahan	Why does this have to be a toll road ? My understanding is that money exists for this project and has been set aside and unused for quite some time now. Why is it that we cannot build non-toll roads ?	2014-07-31 14:05:00
Mary	Dworaczyk	Please build SH45. It was promised years ago. The commuter traffic is not going to slow. Brodie is not environmentally safe. It is now becoming unsafe for the neighborhoods also. Please complete the promise and build SH45.	2014-07-31 17:17:20
Michael	Swartz	Are there related plans to upgrade the Loop 1 intersections with LaCrosse Blvd and Slaughter Lane north of the SH45W project? There are already significant delays at those intersections and the additional traffic this project would generate will likely make that worse. Thank you.	2014-07-31 18:17:16
Alice	Werchan	Please build SH45 SW. We have been waiting for it for many years. The congestion on Manchaca Rd. and Brodie Lane and parts of FM1626 is dangerous. Please build it!! Just a road....2 lanes each way. No gas stations, no McDonald's. Just a road. Thank you.	2014-07-31 20:39:42
Kathy	Bryan	While this new road will certainly decrease travel time for Hays County commuters, it will INCREASE commute times for people like me in Southwest Austin who already use MoPac to drive	2014-08-01 10:35:57

First Name	Last Name	Message	Date Created
		downtown every day. What will be done to accommodate the estimated 30,000 more cars dumped onto MoPac each day? The rush-hour traffic is already a nightmare during the school year.	
Kathy	Bryan	I strongly oppose the construction of this road. Building SH 45 is a short-sighted attempt to alleviate a never-ending problem. At what point will transportation planners seriously consider alternatives such as rail lines and better bus services? Central Texas Regional Mobility Authority and TxDOT are ruining our environment and quality of life in the name of progress. The folks who live in Hays County have probably never enjoyed Barton Springs swimming pool!	2014-08-01 11:35:34
Don	Kruciak	I support building SH45SW. It should have been built decades ago. I believe that is is in the best interest of all parties involved. I believe the Texas Department of Transportation has done a wonderful job in designing the proposed roadway, and it will alleviate some of the traffic issues that I, an Austinite who lives in SW Austin, but NOT on Brodie Lane, face on a daily basis. Do the right thing and build this road.	2014-08-01 16:05:58
Thomas	Doebner	I support SH45SW because it will greatly improve the mobility in northern Hays and southern Travis counties. This project will reduce thru traffic in a residential neighborhood and reduce pollution by eliminating the long stop and go traffic on Brodie. This road has been discussed for 30 years and it is past time to build it. Please don't let the Austin city council slow down or stop this important project.	2014-08-01 16:39:24
Julie	Myhre	Please tell the women that wrote the noise section to look up the Texas A&M Technical report no: FHWA/TX-12/0-5836-2 "Performance and cost effectiveness of permeable friction course (PFC) pavements." Also, search on UT Professor: Manuel Trevino There is a section on the benefits of PFC on noise.	2014-08-02 10:58:48
David	Jensen	EIS should address long term road maintenance issues and costs. What is lifespan of the proposed PFC pavement considering projected usage? Hazmat issues were mentioned in the DEIS discussion. Most spills are a result of negligence and a lack of proper training. EIS should include training of all parties involved in the construction and maintenance of the proposed roadway. At a minimum this training should include DOT Hazmat Transportation and OSHA Hazardous waste operations and emergency response programs. Proposed SH45SW intersection at FM 1626 is a "nightmare". At least one commenter at the public hearing compared it to the traffic problems at "the Y" at 71/290 in Oakhill area of Austin. I agree. Plus it will add yet another traffic light to FM 1626 thus slowing traffic on that roadway. Additionally, improvements (including a bridge) and a widening of FM 1626 is currently underway and should be completed within the next few months. The proposed SH45SW intersection with FM 1626 will require the road to be torn up again to accommodate the convoluted intersection/traffic light. Please seriously consider tying the proposed SH45SW into Bliss Spillar Road (instead of building an overpass over it) and intersect FM 1626 at the current Bliss Spillar traffic light that already exists.	2014-08-02 12:10:21
Charles	Schmitz	I support the construction of SH45. People in the Shady Hollow and Manchaca need a better way to access Loop1 to commute north, and Brodie Ln. is too narrow to handle the traffic. Let's get it done!	2014-08-02 14:29:02

First Name	Last Name	Message	Date Created
al	stlouis	At risk is the Barton Springs segment of the Edwards aquifer. If the proposed roadway leads to increased traffic from the overloaded I-35, the resulting pollution could poison the wells with contaminants. Therefore it is necessary to do more research on how to reduce the substantial risks to the aquifer. The public hearing was rushed and the format too abbreviated to allow genuinely thoughtful consideration of the many risks to the aquifer. It appears there is a rush to move ahead without a more careful plan to protect sensitive land and Karst features that the road would pass over. Since so many people depend upon the water from the aquifer it is not wise to rush ahead without carefully and scientifically analyzing the potential consequences of building a freeway over the aquifer. I strongly support the positions of the SOS Alliance and the BSEAD (Aquifer District) which suggest much more study and better planning is needed before putting 150 wells at risk as well as significant caves and Karst. Clearly, the EIS is sloppy and premature, unscientific and hastily written, and is inadequate to address the significant risks to the aquifer and the endangered species. As a reminder, the Central Texas region is still in a significant and major drought, 4 years now, and no definitive end to the drought is in sight, and it would not be prudent to risk damages to the aquifer for a roadway with so little value to the commuting public: a few minutes of driving saved, but a potential loss of a clean water aquifer. I oppose the rush to build. Clearly, more technical and scientific information is needed before proceeding. Personally, I think the money (est. $100 million or more) would be better invested in either hike/bike trails instead of SH45, or fixing the I-35/130 mess. $100M+ could be used to lower the expensive tolls on 130 so truckers could afford to drive it, thereby freeing up I-35 for the Hays County commuters to Austin.	2014-08-03 15:51:57
David	Bosada	I was against this project since the beginning. Traffic is already unbearable. The area was nice and very ecological with many open forest undeveloped, now it will be filled with commuters and our property values WILL BE AFFECTED. Circle c will no longer be a green area!!! Unfortunately obtuse minds were the majority. Now; and i really hope you pay attention to this request. 45 is a road used heavily by cyclists and triathletes...PLEASE BE SURE TO ADD ENOUGH SHOULDER AND KEEP ROADS FRIENDLY FOR CYCLISTS!!!!	2014-08-03 16:28:59
Kevin	Rolfes	Hello, I wish to comment on the draft Environmental Impact Statement that you recently published. The EIS is lacking an analysis of the environmental impacts that the proposed 45SW would have on the areas adjacent to the project, including south Mopac (45SW to Slaughter) and the 45SW/1826 corridors. If built, the proposed 45SW is estimated to add between 15,000 to 40,000 vehicles to south Mopac, which includes sensitive watershed preserve lands. The EIS should be expanded to include the effects of pollution (air, ground, light, and noise) on these corridors. Sincerely, Kevin Rolfes	2014-08-04 17:09:14

First Name	Last Name	Message	Date Created
William	Tucker	Please, please, please drop Sh 45 SW from the plan. I am dumbfounded that the city would move forward with this project without the proper environmental studies being completely metered out. The powers that be in this town seem to keep thinking that bigger and better, and more roads will solve our traffic problems. This is incredibly shortsighted. The only thing that more roads will create, is more roads - which will equal even more traffic. We are a "car-centric" town and the only way we will move away from this is to put our energy, minds and money toward creating ways to get drivers out of their cars. This is not a short term fix. This is something that will take time. In the end, this is what will make Austin liveable. SH 45 SW would also irrevocably change the character of the Wildflower Center - essentially ruining it as an oasis of nature and quiet. To dump thousands and thousands and thousands of additional cars onto Mopac each day makes no sense at all - I35 is already torturous as a truck route through Austin - Please do not turn Mopac into the same type of road with eighteen wheelers charging down that freeway as well. This road would in no way be beneficial to Austin. Period.	2014-08-04 18:47:02
Thomas	Thayer	The draft EIS as presented is not complete. It doesn't study the impacts from possibly connecting all the way to I-35 (which would overburden MoPac). It also doesn't fully study impacts to sensitive environmental features near the proposed roadway. It doesn't study impacts on the adjacent water quality lands and the Ladybird Wildflower Center. It doesn't study alternatives such as closing Brodie Lane to relieve traffic on that street. Please do a full study of all aspects of the roadway. Any road should be as small as possible with the fewest lanes to lessen any impact on the aquifer.	2014-08-04 20:38:39
robert	hilbig	Please build it. It would save time and money. As for the environment it seems it would be helpful to limit the time the automobiles are actually running and polluting which this roadway certainly would. Even though I avoid peak traffic times I spend a great deal of time sitting in traffic. I forget the exact amount of time the opposition claims this roadway would save but I remember it was a single digit. That is ridiculous. I often spend multiple minutes at multiple intersections trying to get to MoPac. As for Austin's opposition they might want to bear in mind that I and probably many others now drive a bit further to shop in Buda, Kyle and San Marcos because of the traffic. Again please build it.	2014-08-06 19:01:08
Michael	Eisenmenger	I am a resident of North Central Hays County and very much support the building of SH 45 SW. I work in northwest Austin. So, I must commute northward, and currently the best route is using IH 35, which is we all know is not good. SH 45 SW, after the completion of the widening of RR 1626, would be a far better route for those of us living in Hays County and needing to commute to Austin.	2014-08-07 09:59:59
Scott	Bailey	Build it. Now!	2014-08-07 16:52:41
Tim	Dowling	I am an absolute pro-build the road citizen. The community needs the road now.	2014-08-07 16:58:13
Paul	Carnes	Please build this road project. The risk of environmental damage is greater by not building this road and continuing to overload Brodie Lane.	2014-08-07 17:07:51

First Name	Last Name	Message	Date Created
Richard	Maier	We need this road. I fully understand and appreciate concerns of those who believe this is a danger to our environment. However, with proper engineering and water quality design, the impact can be minimized. What everyone seems to ignore is the amount of additional air pollution created and fossil fuels used by traffic sitting idle (the current condition without this road), a situation that will be somewhat or significantly reduced by the construction of this road. Remember, a car sitting on a congested highway and idling in traffic is getting ZERO miles to the gallon, all the while dumping exhaust particulates into the air. Our clean air should be at least as high of a priority as our clean water. Quit delaying and BUILD THIS ROAD!!	2014-08-07 17:28:11
Bill	Blagdan	Here are my thoughts on the project: - The draft EIS fails to analyze the whole project: please look at the environmental impact of the entire Mopac expansion impact including 45SW up through Cesar Chavez - The draft EIS is premature and fails to actually study the impacts like Caves, sinkholes, other aquifer recharge: please withdraw the DEIS when required studies are complete - Please study the harm to Mopac corridor neighbors, the Wildflower Center, and public parks and preserves resulting from air, noise, light, and visual pollution from the proposed 45SW toll road and necessary Mopac expansion - Please invest in alternative solutions such as: Upgrades to I-35, Manchaca, Brodie, bus service, telecommuting, carpooling, ridesharing. Please don't make Mopac another I-35 west.	2014-08-07 19:07:11
Jan	Sprayberry	I am not opposed to finding a solution to the traffic challenges between Hayes County and the city of Austin. I am opposed to allowing an inflow of additional traffic onto an already congested thoroughfare without the proper preparation. Mopac/Hwy45 is currently a death-trap at several intersections. To encourage more traffic is nothing more than irresponsible growth. Resolve the current issues on Mopac/Hwy 45 and prepare the very busy intersections at both LaCrosse and Slaughter Lane before pushing more cars into the mix. If it's not done properly, many motorists will alter their northerly route and take the "short cut" through the Circle C neighborhood. We cannot allow this to happen. Be responsible with the decisions we make regarding our growth so as to not pour salt in an already gaping wound. I say NO TO SH 45SW.	2014-08-07 20:09:09
Shannon	Mickelson	SH45SW is a vital part of Travis/Hays Counties future roads! It is an essential part of the solution, but only the beginning! Please build SH45 as an entire loop !!!!	2014-08-07 22:23:28
James	Coates	Used to live in Shady Hollow. Now live in North Hays County. It has been shown that this road can be build using modern, environmentally safe techniques and design. Not building the road also has environmental concerns. Please build this road to make the area safer for all of us.	2014-08-07 23:25:38
Karen	Hibpshman	I don't see a need for this connection. You will be feeding additional vehicles onto roads that are not designed to handle that amount of traffic. You time would be well spent looking at the addition of traffic signals along the current stretch SH 45 especially at the intersection of SH 45 & Escarpment Blvd. It is time that TxDot take a serious look at what needs to be done know for the safety of those in Hays County and Travis County.	2014-08-08 09:55:51

First Name	Last Name	Message	Date Created
Jason	Goltz	There are a lot of vocal opponents of SH45SW and I want to comment that not all that live in the area agree with the opponents and the organizations. I am a Sierra club member, backpacker and protector of nature and the environment. However, I believe a sensible solution can be built that provides a vital link and fill a necessary hole with regard to local transportation needs. People focus on how MoPac is already a parking lot and it is but that is because of infrastructure and design failures across it's length and connecting to SH45SW is not going to change or alleviate that. It may however, highlight more of the issues that result in problems getting fixed and improved travel efficiency. What SH45SW will provide is an outlet for a congested area that will ALSO take traffic away from MoPac and Slaughter. Once connected to IH35 it will allow for S. Austin traffic to circumvent the MoPac/290 and 290/35 corridors, thereby reducing congestion. When I need to get from Circle C to Round Rock, Pflugerville, the Airport, NE Austin, Manor, etc I am forced to head north through the most congested areas because those are the only thoroughfares. I would much rather zip down to SH45SW and across to SH130 to make the trek north and bypass the heart of Austin. I think many other drivers would as well. I also think improving and connecting bike lanes and trails in the area with the construction of SH45SW is crucially important to the vitality of the area. In South Austin especially, those road and trail features are too disconnected and lack continuity. I say build SH45SW, build it right and build it with the future and the community in mind.	2014-08-08 11:11:39
Jim	Cummings	World War II & the Korean War was won in less time than it taken to build this road. The people in SW Austin & North Hays County NEED this Road - GET ON WITH IT!	2014-08-08 12:19:21
Brian	Hoyt	TxDOT Officials: Please make sure this petition is sent to the appropriate people at TxDOT: https://www.change.org/petitions/stop-another-accident-sensible-plans-for-sh-45-in-circle-c-austin-tx While not specific to the expansion of SH 45 SW, it is related, and we hope these concerns are taken into account as the decision is made on that project. We, the residents of Circle C and Austin, submit our petition as a related matter in the development of SH 45 SW. More than 600 residents have signed. In the week that ended July 26, 2014, there were two separate horrific accidents at the intersection of State Highway 45 and Escarpment Blvd in the Circle C area of Austin, TX. We had enough and launched this petition. This has to be one of the most unsafe intersections in Austin, TX. In fact, folks around town have grown to call it the Autobahn of Austin. The speed limit on SH 45 is 70mph! Cyclists have no bike lanes and are also often at risk, and there are no walking paths connecting the new neighborhoods for our children to safely travel to see school friends. The once rural road is now surrounded by numerous housing developments. And traffic has grown significantly in the last several years with this being a major connection for residents down South to reach MoPac en route to downtown Austin and places North. The entire section of road needs a residential overhaul. Residents in Circle C West, Muirfield, Avana, Merridian and especially the folks at the intersections of Mopac/SH 45 at Archeleta are most at risk (this interchange being something else TxDOT needs to consider at plans for SW SH 45 are reviewed. The Texas Department of Transportation needs to redevelop this area of state managed road and include: traffic lights at cross over intersections, reduce the speed limit, and build bike and walking paths (off highway) along this stretch of SH 45 from 1826 to Slaughter. We ask that TxDOT, the City of Austin and our leaders in Circle C to stop another accident and keep our families safe. 620+ of your constituents demand and answer on how you will make a change this highway you operate so we can keep our families and friends safe. Best regards, Brian Hoyt Circle C for a Safer State	2014-08-08 16:16:13

First Name	Last Name	Message	Date Created
		Highway 45 11601 Hollister Drive, Austin, TX 78739 +1 202 330 3070 circlecforasafersh45@gmail.com	
Ray	Olah	Anyone who drives on MoPac regularly and, particularly, during "rush hour" times knows this road is not going to help anything. Traffic going North already backs up at Slaughter in the morning and then bottlenecks at two points before you even get to the Southwest Parkway area. Folks driving SH45SW will wind up in backed up traffic before they even round the corner to get on MoPac. Some will wind up still driving up Brodie anyway and some others will filter over to Escarpment and cause the same headaches for Circle C and Western Oaks residents that the Shady Hollow residents now have. Worse, TxDot will eventually connect SH45SW to I-35 and then 130, bringing even more traffic through our neighborhoods. We're being sold a bill of goods.	2014-08-08 21:17:02
Nancy	Herron	I am in support of the construction of SH45. TxDOT must respond to the tremendous growth in the region and consequential transportation needs. SH45 will help alleviate the congestion on Brodie Lane. I would prefer SH45 not be a toll road or have a timeline to in place to lift the toll at some point in the future.	2014-08-09 07:50:37
joe	dale	I have lived in Shady Hollow for 7 years. Traffic on Brodie has almost doubled, or it seems so, in that time. During both rush hours traffic is backed up on Brodie from FM1626 to Slaughter. Slaughter eastbound from MoPac is a disaster as it reaches Brodie during the afternoon rush hour. Brodie was not designed to carry all the traffic now streaming in from Hayes county. Keep Brodie local. It is time to build SH45SW. I'd rather it had been designed as a 3lane county road but the toll road will do.	2014-08-09 09:39:07
Jeanne	Devine	This proposal is not yet complete. For one thing, SH 45 will have relatively little impact unless it eventually connects MoPac with I-35. Right now, 1626 (near which I live) is a 2-way street. It would be transformed into an extension of SH 45 so MoPac traffic could reach I-35, and vice-versa. It would need to be widened, for sure, and probably tolled too. For another thing, some environmental studies are still underway. Once we have made a mistake about the environment, it will be difficult or impossible to reverse it. Let's not allow a lame-duck county government to make a decision that will affect us for decades to come. Thank you for considering these comments.	2014-08-09 09:50:07
Ron	Rogerson	I am impressed by the extra efforts to find a balanced solution for this long needed road. It is nice to see that TxDOT can take on such challenging environmental issues. Keep up the good work and keep this project moving forward! Ron Rogerson	2014-08-10 11:39:39
Lisette	Schmidli	This proposal is NOTa solution to traffic congestion in SW Travis County. Connecting MoPac to IH-35 would be a nightmare for those of us driving on the west side of town. It would invite IH-35 traffic to get on MoPac. I drive MoPac many times a week. The lanes are completely packed, and my driving is not even at rush hours. The re-modeling of MoPac is narrowing the lanes, increasing the danger of driving alongside big trucks. Already, the passing-thru-traffic of big trucks needs to be banned on MoPac. Creating this "loop" around south Austin does not solve any problems. Studies have shown that the proposed road would reduce drive time in the area by less than 5 minutes! TxDot's investigation does not adequately address pollution problems of perpetual road runoff in a sensitive area that affects our water sources. It also ignores the problems the actual construction of such road would cause. This is a kneejerk "solution" to traffic congestion. We can never go back and restore recharge zones for our aquifer. Don't build this road.	2014-08-10 13:21:44

First Name	Last Name	Message	Date Created
melanie	clapp	Please keep MOPAC local. I am a homeowner in travis county and live near Mopac and 2222 the impact of 30,000 more cars from another county at the tax payers expense is not adding up. My family owns a farm on the aquifer in Williamson county and due to the rock crushing of a neighbor the water no longer flows as it once did. They finally got it stopped because of the environmental impact but it was too late the water is forever dried up. Is that what you want for Barton Springs one of Austin most valuable resources? Dried up and useless to benefit developers in another county at travis county taxpayers expense. Please stop this!!!!!! Thank you for your time, Melanie	2014-08-10 16:01:13
J	Mann	Again and again, study after study, SH45SW has been determined to be the only viable solution to traffic congestion in the SW Travis/Hays County corridor. It is past time to move forward with this project.	2014-08-11 15:32:49
Lisa	Beach	I am disgusted by the fact that we are still debating the construction of SH45SW even after voters approved it years ago! How much expansion needs to take place in southern Travis county and northern Hays County before we are willing to admit we have screwed up? There are too many cars on Brodie Lane during rush hour and most of them don't live in an adjoining neighborhood, and last I checked Brodie is still a two lane road, one heading north, and one heading south, not a major thoroughfare as it is being treated. I am now hearing that opponents to SH45 are calling for yet another environmental study? You all are failing to realize the fact that one environmental impact study has already been approved by the federal government in 2007, and that some approvals you are demanding cannot even be requested until construction design work is completed and available for review. If you are going to continue to oppose this, then come up with a better option besides doing NOTHING. There is a traffic problem and it will get worse in the coming years especially if you do NOTHING. Walk a mile in my shoes and then let's talk!	2014-08-11 16:40:37
Janice	Culp	I have lived next to Brodie Lane for 6 years and am unable to go for a walk on the expensive sidewalks on Brodie for the fumes from the 20,000 cars that use this as freeway to get to MoPac to go to work and back. All of Hayes County comes this way and they have had the sense to realize we need the SW Hwy to get to MoPac by offering 5,000,000.00 to help get it. The Tree Huggers are just like the ones we had when we built MoPac. Remember that one, if we don't build it they won't come. I believe Jeff Friedman was the Mayor then. They have done the study that says the water will not be contaminated on the Edwards Aquifer. This town is a mess for traffic and will not get any better with the group running this city. Please do something about this problem, it has been going on for way too long. I have lived in South Austin all my life and am wondering where I can go for fresh air. Thanks for letting me get this off my chest. Janice	2014-08-11 16:58:31
Beth Ann	Ray	The Austin Chamber of Commerce supports the preferred alternative for SH 45 SW which will address regional connectivity, provide an alternative to today's highly-congested roadways, and leverage multiple funding sources.	2014-08-11 17:09:05

First Name	Last Name	Message	Date Created
MARY	HURLEY	When we bought our house in Shady Hollow, Brodie ended 3 streets past ours. That was in 1992 and the only way you coud get to the south was to take Edwards Hollow, and so their was a minimal amout of traffic. Some time after that we voted for a bond issue that would build a raod that would go around and meet up with Mopac, it was voted for and so it was just assumed that it would be built fairly soon. Here we are all these years later, and getting on Brodie has become a night mare. It was pushed all the way through to 1626. Now 1626 has opened up for most of Hays county, that doesn't want to drive on 35, to use our main road through our neighborhood. When they started to close Brodie again, they allowed Hays County residents to voice their opinions. I never did understand that logic, since they were not paying Travis County taxes!! They should not have had a say about the closing of a neighborhood street. There is never a time when it is not crowded coming and going. The morning is a nightmare. I do not understand why the authroity that makes these decisions has not followed through on a promise that was made many years ago. Please vote for the new construction and let our neighborhood street be what it was designed to be, once again.!!! Thank you for your considrtion. Mary Hurley	2014-08-11 23:19:42
Becky	Broderick	Please build Texas SW45. This has been planned for 20 years, and is late in coming. The City of Austin Council is a bunch of idiots if they think not building 45 will slow down growth. They are the main reason people are moving out of the city. Local neighborhoods on Brodie can't take the traffic. It's destroying the neighborhood feel, causing accidents and delays. MoPAC traffic is already running on lower Brodie Lane. It's just awful. I can't get out of my neighborhood on any given day at any given time. DO SOMETHING NOW!!!!	2014-08-12 10:45:33
Kevin	Tomasek	Regardless of the 'do not build' comments. The fact remains that too much traffic is passing through brodie lane. The automotive based pollution of having 1000's of cars idling on brodie lane is far worse than an efficient roadway for the hays county people to use to get to austin. My neighbor hood is close enough to the intended roadway to decrease the value of a subset of the homes. Aside from that it is a net benefit to the values of homes on the south brodie corridor. I know of a number of people who do not even consider living down brodie because the know the traffic is horrendous. Travelling the 3 miles from my house to slaughter consumes 40% of my commute time and the commute distance is 12 miles. I would love to have a less intrusive, cost wise and environment wise solution, but that is not possible. UNLESS you get people to stop driving to work. That will not happen as long as employers require people to show up at a place of business. Tolls are an acceptable solution as long as when the constructions costs have been recouped, the tolls disappear to the funds are then transferred to the people of the state and the state owns the roadway. I do NOT believe that we, the people of tx, should be the long term retirement plan for the abundantly rich people who might finance this. The financiers make their money financing, not owning or developing a capital product to be sold at a later date. We, I, voted on this in 1985 and it passed. It should already be done.	2014-08-12 10:56:13
Gin	Hurst	IMPORTANT TO LOOK AT BIG PICTURE BEFORE DECIDING TO PUT MORE TRAFFIC OVER THE AQUIFER. SH45SW WILL ENCOURAGE MORE BUILDING AND COMMUTING OVER SENSITIVE RECHARGE ZONES. WHEN BARTON SPRINGS IS HARMED IN ANYWAY, WE ALL LOOSE - THOSE WHO ENJOY THE NATURAL BEAUTY OF THE SPRINGS AS WELL AS THOSE INTERESTED IN ECONOMIC GROWTH. I AM OPPOSED TO BUILDING SH45SW. THE	2014-08-12 11:10:09

First Name	Last Name	Message	Date Created
		PEOPLE WHO ARE IN NEED OF THE COMMUTE MIGHT WANT TO CONSIDER CLEAN TRANS LIKE TRAIN FROM THAT AREA WITH PARK AND RIDE.	
Maryann	Riordan	Please build SH 45 now! Thank you.	2014-08-12 11:31:15
Jennifer	Sobocinski	I support the building of SH-45. Living off of Brodie Lane and taking the road to and from work everyday, I see the increasing traffic which a two lane road simply cannot support long term. MO-PAC is a 4 lane road, built to handle more traffic than Brodie. We can build SH-45 in such a way to mitigate the ecological concerns that using an antiquated neighborhood road as the answer cannot. If built properly, SH-45 can spread the traffic across southwest Austin in a way that not building it cannot. It is about more than one neighborhood. It is about supporting the growth of the city as a whole. Thank you for considering my input.	2014-08-12 11:34:13
Dick	Kallerman	The SH 45SW DEIS is seriously incomplete. It has ignored potential substantial cumulative effects in the 42,000 acre area of interest. For example: The addition of two lanes to South MoPac, intersection enhancements to MoPac at Slaughter and La Crosse, and the potential three mile connection of 45SW with IH 35.	2014-08-12 11:42:34
Bruce	Melton	My name is Bruce Melton. I am a registered professional engineer in the State of Texas and my research focus is stormwater pollution treatment. The 90 plus percent removal rates claimed for TSS in this EIS are not realistic. They do not include catastrophic failure events that substantial decrease the average treatment efficiency described in the literature (as the 90 percent suggested by this EIS). The 90 percent TSS removal rate suggested by the EIS is also very misrepresentative of the science of stormwater treatment. This EIS follows Texas Commission on Environmental Quality (TCEQ) rules for development over the Edwards Aquifer. I played a part in the development of these rules in the early 1990s as an employee of the Environmental Protection Program at the Lower Colorado River Authority where I was the principal investigator for a million dollars in EPA Clean Water Act stormwater treatment research. At the time I was adamantly against the adoption of this misleading TSS standard and the suite of poor efficiency treatment technologies proposed. These rules and the treatment technology practices have not changed substantially to this day. TSS is just one of a cocktail of contaminants in stormwater. It also happens to be the easiest to treat through mechanical straining. All of the other contaminants including nutrients (nitrogen and phosphorus), heavy metals, hydrocarbons and pesticide/herbicides, are dissolved in stormwater runoff or consist of molecularly sized suspended particles that cannot be mechanically removed like TSS (total suspended solids). More difficult to treat than TSS are the nutrients and ionic contaminants. Nitrogen leads the pack at on average treatment efficiency of about zero percent for the best treatment technologies that TCEQ prescribes. Only about a third of the phosphorus can be removed and less than half of heavy metals, hydrocarbons and pesticides/herbicides. The porous pavement technology being suggested for use in this EIS is unproven. Only scant data exists as to its effectiveness. But even if the scant data is accurate, the stormwater contaminant removal efficiency of porous pavement is very similar to the meager treatment methods prescribed by TCEQ. In addition, new science has been published on the amount of water transmitted to the Edwards Aquifer from the uplands zone and the contaminate treatment capacity of soils in the uplands. TCEQ rules assume that treatment of water irrigated onto soils or otherwise forced to flow across soils in the uplands is complete. This new research uses 21st century eddy covariance evapotranspiration	2014-08-12 12:05:15

First Name	Last Name	Message	Date Created
		technology vs. simple 1950s stream gauging techniques of the old science and shows uplands recharge to be about an order of magnitude larger than previously assumed. In addition conveyance of stormwater to the aquifer and to Barton Springs through upland soils and geology is two to three orders of magnitude faster than previously assumed, leaving far, far less time for natural assimilation of contaminants. The pollution treatment capacity of these uplands soils have also been evaluated using a contaminant mimicking cocktail applied to the ground above a cave where the soils treatment efficiency is monitored by laboratory analysis of drips from the cave ceiling. Contaminant treatment has been found to be almost zero.	
betty	luker	Dear TxDOT and CTRMA officials: Please build this road ASAP. SOS has held up Austin's road systems long enough. This road is over 20 years late. Do not let these wingnuts derail our city's progress. This road will allow far south Austin and Hays county resident access to MOPAC without clogging up a small neighborhood street. Brodie is not a highway and yet it is being treated as one. It does not have sufficient environmental controls. The new road will protect our water quality far better than a 30 year old residential street. The traffic, financial, environmental and social impacts caused by SOS are ridiculous and must be stopped. We have had two EIS studies performed and they both prove this road will be an improvement and protect our water supply. Please do everything in your power to build this road as quickly as possible, our quality of life depends on it. Austin's traffic problems are national news and give our city too much bad press We desperately need this road, don't allow a bunch of liars to stop our progress. . Thank you for your consideration.	2014-08-12 12:15:47
Don	Elder	This road needs to be built. Bridie Lane is crowded with too much traffic. The problem is the volume of the traffic, not the speed. During morning and evening commute the average speed I experience is about 5 to 15 MPH. This is due to too many cars being funneled into a neighborhood street. We need the Hays and other Travis traffic to have a more direct access to Mopac without being forced onto a neighborhood street. It is very difficult and unsafe to cross due to heavy traffic flow.	2014-08-12 12:20:00
Amanda	Sylvie	If SH 45 SW is built according to the current plan, will the next step be to complete a connecting segment from 1626 to I-35?	2014-08-12 12:29:12

First Name	Last Name	Message	Date Created
Karen	Clary	I do not support the construction of SH-45SW as proposed in the Draft EIS for the following reasons. 1. It does not meet the stated need to reduce congestion in Austin. It merely shifts congestion from one set of roads, Manchaca Road and Brodie Lane, over to MoPac South, which is already extremely congested. Austin needs a regionally based solution to traffic congestion and this DEIS is not that. In addition, by using SH-45SW to connect FM 1626 to SH-45W, a new route that connects IH-35 to MoPac will be created. This in turn will likely serve as a bypass to shift even more traffic off of I-35 to add to congestion on MoPac South. 2. It would add more traffic noise to MoPac and decrease my property values. I live in South Austin, approximately 1/2 mile distant as the crow flies from the intersection of MoPac and Southwest Parkway. Traffic noise from MoPac is already a problem for the neighborhood and will only get worse with the addition to more cars to the roadway, especially trucks traveling at highway speeds. Shifting truck traffic onto MoPac South will only make it worse. The DEIS does not consider this cumulative impact on neighborhoods that border MoPac South. It is a fact that proximity to traffic noise had an adverse effect on home values. We bought our house in 1989, long before MoPac was extended southward to Circle C. Since then, and with the extension of Southwest Parkway feeding off of MoPac, traffic noise has only increased to the point where traffic noise is a constant problem. As a result, our neighborhood, Travis Country, has lost its appeal to many as a tranquil place, and our property values suffer. None of these kinds of long term, cumulative impacts to existing neighborhoods along MoPac South are addressed in the DEIS. I request that this issue be addressed and mitigation for noise abatement be considered. 3. Adverse Traffic Noise Impacts to the Lady Bird Johnson Wildflower Center. The Lady Bird Johnson Wildflower Center is a nationally acclaimed, iconic and unique botanical garden, cherished by both Austin and the rest the nation, if not the world. Many school children visit the Wildflower Center every year to learn about nature. As an outdoor botanical garden, tranquility is key to the mission, the learning and enjoyment of the Wildflower Center. Traffic models generated by the DEIS study indicate that when SH45-SW opens, it will funnel a minimum of 30,000 cars a day up MoPac South. All of this traffic will pass by the Wildflower Center, located at the intersection of La Crosse Avenue and MoPac South. Traffic noise from MoPac South, a high speed freeway, is already a problem for the Wildflower Center. Once opened, traffic volumes would be expected to increase from the initial 30,000 additional cars to a greater number. The amount of traffic noise generated by these increases may likely discourage people from enjoying and visiting the Wildflower Center, which relies largely on admission and membership to sustain it financially. As proposed in the DEIS, SH-45SW jeopardizes the existence of the Wildflower Center. This concern has not been addressed in the DEIS and recommend that it be addressed as a direct adverse impact. 4. Other modes of transportation are not promoted by the DEIS. The DEIS proposes to solve the traffic problem by adding more cars to MoPac South which will increase congestion on that roadway. This action does not solve the overall problem of traffic congestion in south Austin, which is only going to get worse as the area is developed. Minimally, increasing bus transportation options, bike paths and even light rail should be part and parcel of the proposed DEIS. These alternatives were dismissed in the environmental study but should be included. I appreciate the opportunity to comment on the DEIS and thank you for your attention to this letter.	2014-08-12 12:37:58

First Name	Last Name	Message	Date Created
William	Tucker	My wife and I had to drive on I35 last week and we ended up among wall to wall eighteen wheeler trucks. This trend has been bad for years and years and is only getting worse. Mopac is a relatively safe and truck free freeway - please, please, please do not make this road another truck motor zone. AND, please do not drop tens of thousands more cars on mopac each day!!!! Please .... KEEP MOPAC LOCAL KEEP MOPAC LOCAL KEEP MOPAC LOCAL KEEP MOPAC LOCAL KEEP MOPAC LOCAL KEEP MOPAC LOCAL KEEP MOPAC LOCAL sincerely, William Tucker	2014-08-12 12:45:07

First Name	Last Name	Message	Date Created
Taylor	Nelson	My name is Taylor Nelson. I am a native Austinite and current resident after recently graduating with a Bachelor's degree in Chemistry with a focus on Environmental Chemistry from Whitman College in May 2014. In September of 2014, I will be attending Stanford University to work on a Master's degree in Environmental Engineering and have spent the summer in between working with the Save Our Springs Alliance as a research intern. My concern with the Draft Environmental Impact Statement is that it generally fails to completely account for various impacts and provide clear plans for addressing them. Additionally, the Draft EIS was written before key environmental studies were completed, meaning the full extent of the project's impacts is still uncertain. Please see below more detailed comments addressing these concerns. Failure to Properly Account for Project Impervious Cover The Draft EIS cites the amount of existing impervious cover in the project area as 22.9 out of 309.1 total acres (7.4%), and this value is used to estimate the amount of TSS loading under existing conditions (Table 5.1-3, page H-45). However, a map of the project area used in this determination includes sections of existing roadways in addition to the state owned ROW in which the proposed new road would be constructed (page 29). Using a map of the state owned ROW and GIS data obtained from the City of Austin, the amount of existing impervious cover within the state owned ROW was determined to be 2.7 out of 192.1 total acres (1.4%) using ArcMap. This value is more representative of the existing impervious cover within the project area, as it only includes the currently undeveloped area of the state owned ROW and not existing roadways. Therefore, this value, or another value that is more representative of existing conditions, should be used to estimate existing TSS loads. By over counting the amount of existing impervious, the Draft EIS under estimates the increase in impervious cover and therefore the increase in TSS loads. This creates an underestimation of the impacts from increased impervious cover resulting from the project. Furthermore, the Draft EIS fails to address the potential impacts of an increased amount of impervious cover on the quality and quantity of water recharging into the aquifer. New paved surfaces including the highway and shared use path, other impenetrable features such as water quality control ponds and other runoff control measures, and soil compaction resulting from construction will all contribute to limiting the natural permeability of water through soils within the project area. Failure to Limit the Application and Potential Migration of Pesticides The Draft EIS claims that "Integrated Pest Management (IPM) practices would be employed to reduce the need for pesticide application along the state-owned ROW," but there is no description of (only reference to) the IPM practices to be implemented, nor is there discussion of the potential effects of pesticide or herbicide application allowed by IPM and/or the TxDOT vegetation guidance manual on threatened or endangered species. Later, the Draft EIS claims: "In respect to pesticide residues, TxDOT would not apply herbicides in the proposed project corridor," contradicting the referenced IPMs which simply reduce herbicide application (page H-49). This contradiction to the previous statement	2014-08-12 12:49:41

First Name	Last Name	Message	Date Created
		makes it unclear whether herbicides will be applied. Furthermore, due to the lack of description of pesticide application, and because "quantitative data to demonstrate the effectiveness of non-structural BMPs on reduction of these chemicals is limited," it is impossible to determine whether the resulting concentration of these materials released into the aquifer could potentially affect endangered species (H-92). Although the Draft EIS asserts that TSS loads from the project area will be reduced as a result of the implementation of BMPs during the project, comments from Dr. Lauren Ross argue that these assertions may be unwarranted, and TSS loads could potentially increase, especially during construction phase. Hydrophobic pollutants such as pesticides are highly adsorptive, allowing them to easily associate with sediment. An increase in TSS coupled with the use of pesticides would increase the mobility of pesticide pollutants through the groundwater system by water recharged into the aquifer from the project area. Failure to Perform Complete Biological Survey Within the Project Area The Draft EIS claims, "Based on best available information, no impacts to federally listed karst invertebrates would occur as a result of the proposed project" (D-11, Table 4-2). However, during a technical meeting (July 25, 2014), it was stated that a specimen of the Texella genus and yet unidentified species was collected in Barker Ranch Cave, a cave within the project study area. Additionally, it was stated that biological surveys in other karst features had not been fully completed, and the Draft EIS states that "karst surveys are being conducted within the existing state-owned ROW to verify" that various federally and state listed species do not occur within the project area (Table3.8-2, page 219-227). Biological surveys of all identified karst features within the study area should be completed before assertions can be made that federally listed species will not be impacted, as it is unknown whether these listed species inhabit the project area. Failure to Address Impacts to BCCP Species of Concern At a project technical meeting (July 25, 2014), it was stated that at least 3 karst features with the project study area contain species of concern protected by the Balcones Canyonlands Conservation Plan (BCCP). However, the Draft EIS contains no mentions of the presence of these species, nor plans for mitigation required by the BCCP. Failure to Account for Visual and Noise Impacts The proposed build alternative includes the construction of a highway that will be built mostly on top of fill to minimize ground disturbance and will include bridges over intersecting creeks and existing roadways. Although the Draft EIS includes a study to determine the noise impacts on receivers near the new segment of the highway, it does not account for the potential noise impacts in other nearby areas of interest. Traffic studies have indicated that traffic on Mopac would be expected to increase with the construction of SH 45 SW, and the increased traffic could potentially cause significant noise impacts along the Mopac corridor. This is especially threatening to areas of quiet enjoyment, such as the Ladybird Johnson Wildflower Center, which have the most stringent noise reduction requirements. Additionally, the visual impacts and the mitigation for them, while mentioned in the Draft EIS, are not explained in detail. Design plans exist within the Draft EIS that contain enough information that "priority viewpoints" which will be preserved or enhanced through project design can and should be identified and planned for (page 316).	

First Name	Last Name	Message	Date Created
Ed	Hite	I have lived in Shady Hollow since 1996 and what we have let happen out here is inexcusable. We are putting our children at risk everyday with 3 schools in the immediate area. They can't hardly walk or ride a bike to school anymore due to traffic. It takes me a good 20 minutes just to get from Brodie Lane to Slaughter every morning so you city council folks that say it would not save more than 2-3 minutes getting to Mopac have no idea. Have you driven it? Build it now and quit wasting everyone's time and money. Bridget Shea would stop all development today if she could but you can't! This is way past due and better for the environment.	2014-08-12 13:04:17
Kayci	Temple	We adamantly appose SH45. It will have a horrendous impact on the ridiculous Mopac traffic and other traffic improvements MUST be completed prior to building this highway--underpasses at Slaughter and LaCrosse, and improvements between 1826 and Mopac. This highway will benefit a tiny group of Travis County residents, and will mostly benefit Hays County residents. But HC will only foot a portion of the bill. This is not a viable solution to the traffic issues in Travis county and the City of Austin.	2014-08-12 13:16:10
Elias	L	The need to build it has been there for decades, the bottleneck effect is now there to go along with the need to build SH45SW. On the flipside, had the road been built 20 years ago the technology and engineering would not have been there to do it with the "smarts" that is now accessible to us. If we continue to wait and drag and stall this road, then you are unintentionally playing politics. Please help your city...build SH45SW.	2014-08-12 13:31:19
Dana	Byars	As a 15 year resident of far south Austin I have seen many changes occur as a result of our booming population. One change I do not see however is additional routes being added for all these people to move through the city. SH 45 has been talked about since I arrived here and still nothing has been done. Brodie lane is NOT an appropriate travel route for commuters from south Travis and Hays counties to access Mopac. Mopac is not a "local" road. It is the main route everyone in SW Austin uses to get downtown and beyond. Brodie on the other hand runs directly through Shady Hollow, a well established neighborhood. There are many schools that are accessed using Brodie lane including Baranoff Elementary, Bailey Middle School and Bowie High. The kids in Shady Hollow cannot walk or ride their bikes across Brodie safely because of the extreme congestion on this truly local road. Brodie is a "lane" Mopac is a "loop". Build SH 45 now and quit pretending you can control "sprawl" by refusing to improve transportation for those of us who have lived down here for years. Thanks!	2014-08-12 13:40:18
Tom	Dever	Please build this road. It has been needed for a long time!	2014-08-12 14:18:18
Kolleen	Benjamin	Please, please do something about the heavy traffic that travels on Brodie Lane right through the residential neighbors, including Shady Hollow. If any of our city leaders had to endure the frustration of the traffic through this area on a daily basis, SH45 would have been built by now. I beg you to visit during high traffic times during rush hour for it to be seen and fully understood by the decision makers. The volume is the problem and is not meant to flow through a two-lane residential community. It's worth driving here to view for yourselves.	2014-08-12 14:21:06

First Name	Last Name	Message	Date Created
Alan	Albers	SH45SW needs to be built ASAP and can be done while protecting the environment. As an example of environmentally-prudent road building, please examine Round Rock ISD's "Pearson Ranch Road' now serving an elementary school and Transportation Center adjacent to the Avery Ranch neighborhood. During this road construction, over 140 karst features were uncovered (!) and by working with the city of Austin's Environmental and Watershed Protection Departments (Sylvia Pope and others), this road was built while protecting recharge features and other important underground areas. Certainly, viable recharge features need to be and must be protected. Current road-building technology can do this! Build SH45SW ASAP.	2014-08-12 14:21:52
Ray	Grasshoff	I support strongly the construction of SH 45SW. Please make it so.	2014-08-12 14:42:00
Jonathan	Beazer	I do not support the construction of SH 45SW for three primary reasons. 1. The additional noise pollution of the highway right next to my neighborhood. 2. Major concerns with the safety of bicyclists using Mopac to access the Veloway. 3. Even more traffic congestion that this highway would place on Mopac south of Slaughter Lane. Sincerely, Jonathan Beazer	2014-08-12 14:47:56
Allen	Doberenz	I live in the area that will be affected by SH45 and fully support the building of it as it will help my movement in the area as well as relieve severe congestion along Brodie lane and Slaughter where my kids attend school.	2014-08-12 14:50:04
Mary	Saucedo	We desperately need to get SH45 built so that this road gets Hays county's traffic going to MOPAC off of our neighborhood street.	2014-08-12 15:04:25
Jim	Gilbert	As a resident of this area (Sendera), I am in FAVOR of SH-45W. It needs to be built to alleviate congestion along Brodie Ln, and to and from the Buda area.	2014-08-12 15:05:46
Douglas	Rockstead	State Highway 45 needs to be completed. It is a joke that with the population as it is and the number of cars on the road we do not have any alternative east/west route on the south side of town other than city streets like Slaughter and William Cannon. We need an overpass at slaughter and Mopac needs to connect to 45 to allow traffic access to 35 to ease congestion on city streets between I-35/Mopac/Ben White and for lack of a better way of saying it, "Buda." There isn't a good east/west option for those of us that live in Far South Austin. For that matter we need to expand Brodie. Too many people live off that road and it's one lane each way.	2014-08-12 15:06:05
Laura	Judd	To Whom It May Concern: South Austin is busting at the seams and really needs the SH45SW road to go through ASAP. Putting speed bumps on Brodie Ln. will NOT lessen the traffic use. It will only make the movement on the road more congested. Its not that people are speeding. People are just trying to get from point A to point B and finding it more difficult. Please assist in getting this road completed. Thank you.	2014-08-12 15:11:37
Victoria	Harkins	This is to plead for the Mopac Extension. Our home and neighborhood suffer from the absolute overload of traffic through Shady Hollow. People cut down side streets and speed through our street and neighborhood trying to cut-off what can take 30 min to get through. My children are just now at driving ages and I absolutely fear the stretch down Brodie. Families are choosing to not move into our community as none of them want anything to do with the snarl every morning and evening.	2014-08-12 15:12:58
Mariah	Watkins	I am terrified what this road will do to our land, aquafer and traffic on mopac. This is being paid by Travis county tax payers for hays commuters to be run by a company that will make money. What will austinites gain?	2014-08-12 15:16:57

First Name	Last Name	Message	Date Created
Ed	Stokes	Let's finally build 45 so that South Austin can have another route to the city. Thanks	2014-08-12 15:18:50
Troy	Miller	As a native Austinite for nearly 30 years, and a new resident of south Austin, I just want to say that I support any and all improvements to Austin and the surrounding areas roadway infrastructure. Especially SH 45 SW which is desperately needed to continue to support the growth of the city that we can no longer simply ignore as a reality. Especially if this contributes to getting a loop around the city in the future. Maybe next we can get a bridge over Lake Travis. Just a thought.	2014-08-12 15:19:02
Connie	Hawkins	It now takes me 30 minutes to get out of our neighborhood, Shady Hollow, at peek times. I don't understand why keeping MOPAC local is an option? We are not a small town anymore. I would like my neighborhood to stay local. It was not designed to be a major roadway. I love and care for Austin. It has been my home for 30 years. We moved out here to be away from traffic and it is now at my doorstep. Everyone is frustrated with the growing pains, but we have to find a way for commuters to safely come into Austin from Williamson, Hays, and surrounding areas if you are advertising jobs. Hiding from the problem because we would like it to be different is not an option. We asked for this years ago. Studies that cost money and are not coming up with solutions are not the answer. Austin is full of smart creative people---come on find an effective solution!! Build 45 and keep traffic out of the neighborhoods.	2014-08-12 15:21:47
CHARLES	HEMPEL	Please build SH 45SW and build it as soon as possible. I live in Cherry Creek off Brodie Lane very close to Shady Hollow. I try not to travel through Shady Hollow subdivision but sometimes I have no other choice. The through traffic is horrible. These cars need to be on MoPac. MoPac is a highway and it was built to handle this traffic. Brodie Lane is a city street. This should be a simple issue.	2014-08-12 15:22:20
Stuart	Pace	A fair environmental study is needed!! Why has this process been fast tracked? It smells fishy! Do not build this road in Travis county for Hays county residents when the residents of Travis county are against it.	2014-08-12 15:26:34
Lorraine	Fitzgerald	Since moving to Austin in 1993, I have noticed an unbelievable increase in traffic on Brodie Lane south of Slaughter Lane. I originally lived in Shady Hollow, but now reside within the same zip code. My in-laws recently moved into Shady Hollow and have to plan all their appointments and shopping trips around rush hour traffic. Speed bumps would only cause more traffic back-ups on an already over-congested roadway.	2014-08-12 15:31:49
Tim	Black	SW 45 has been studied, approved, and funded. The majority of people who will be affected have voted yes. Time to stop talking and build it.	2014-08-12 15:33:01
Michael	Doerr	Having lived in the area for many years I have seen the severely negative effects of the poor transportation options, however I have also seen the severely negative effects of poorly monitored construction projects and poorly enforced littering / polluting laws. I truly feel that this roadway is very necessary and also that it is extremely necessary to monitor and enforce strict construction techniques and anti-litter / anti-pollution campaigns for the area. I certainly do not want there to be any damage to our critical environmental area and I believe that there are protective measures and construction techniques that can be utilized and monitored to keep any disruption to a minimum.	2014-08-12 15:35:38

First Name	Last Name	Message	Date Created
Joanne	Edge	This is to strongly support the building of SH 45. SW Austin desperately needs relief from the traffic from the south pouring through our streets (Manchaca, Brodie, Slaughter, etc.), to get to Mopac/Austin. Ms. Shea, speed bumps on Brodie WILL NOT solve this problem. Good grief, that's worse than moronic and ridiculous. What is this woman thinking?? The current Council has no idea, has never wanted to have any idea, will never have any idea what this issue means to the many citizens who live in this area. They have no comprehension that the city limits of Austin don't stop at downtown and central Austin. Thank God we are months away from having a true area representative. In the meantime, those of you (e.g., Ms. Shea) who don't know the facts about the issues and problems in this area, please just keep quiet and don't any further damage until we can get a new Council in place. Most of all, if possible, thank you for your support of SH 45.	2014-08-12 15:41:25
Becky	Hull	We desperately need for the SH45SW to be built. The traffic is already so bad in every road in SW Austin. The growth is staggering out here. I have lived in Circle C for 8 yrs and just in the last year, the amount of traffic is absolutely shocking in its growth. The roads are already behind the need as it is. It is absolutely necessary to finish this highway. I have lived in Austin since 1972 and if the city of Austin had looked forward to the growth that they knew would happen; we would not now be listed as one of the worst cities in the USA, for traffic congestion. Let's pull together and make this highway happen. Let's add lanes to Mopac going up to Slaughter. Please consider the needs of the citizens of Austin, and go forward with this highway and also adding lanes to the already existing Loop 1. Sincerely, Becky Hull	2014-08-12 15:44:08
Joel	Seffel	As long-term residents of Shady Hollow, we strongly support SH45SW. This project is long overdue and we have been waiting for it to start for over 25 years. The traffic on Brodie through Shady Hollow is choking us. We cannot even get out of our own subdivision in the mornings. While SH45SW may not solve all the traffic issues, it will certainly alleviate them. The problems of runoff and endangered species can and must be addressed in the construction process. Please move forward on SH45SW. Thank you for your time. Beverly and Joel Seffel	2014-08-12 15:48:44
Cynthia	Cabler	I have lived at this address for 24 years. During that time I have seen this area explode with growth -- from a handful of quiet, out-of-the-way rural neighborhoods into many suburban neighborhoods along Brodie and beyond. When I moved here, Brodie ended at my neighborhood by the old fire station near the intersection of Brodie & Edwards Hollow Run. If one wanted to get to 1626 from there, one could then take Edwards Hollow Run and snake around through my neighborhood to Frate Barker Rd then Hewitt Lane to 1626. When Brodie was completed to 1626, there were some in the neighborhoods to the north (there were none built south yet at that time) that didn't like the new traffic patterns -- but we in my neighborhood of the Estates of Shady Hollow were relieved to get that traffic off our streets and onto a major road. However, Brodie was not designed to be the major artery that it has become. There are many new neighborhoods along Brodie to the south of us; accomodating that increase in traffic would be enough. But the explosive traffic growth in Hays county needs to be rerouted onto an actual thoroughfare. I know those commuters really don't want to spend a half hour looking at our lovely neighborhood in rush hour. I don't want to spend a half hour trying to get out of my neighborhood just to get to the grocery store. There was a movement afoot a few years ago to block off Brodie -- to make it again into the dead-end non-thoroughfare that it used to be. I was against that at the time, but now I wish it would have been done! But the best solution is to build 45 and get those Hays people to their jobs, etc. in the most efficient way possible!	2014-08-12 15:51:32

First Name	Last Name	Message	Date Created
		I love my home & neighborhood, but the traffic problems are starting to make me look at moving. Such a shame.	
Marianne	Fitzgerald	Please get this project done - the sooner the better, I'd say. It is so badly needed by anyone who travels from Buda, Kyle, San Marcos, etc., to Austin. It will take a load off poor old Brodie Lane and Slaughter, which have become the interurban routes for the people of other surrounding cities. Please get it done. I hope you do not listen to the SOS folks who do not even live here. It is worse for the environment to have hundreds of vehicles sitting at the Slaughter/MoPac lights chugging away, wasting gasoline and time while they try to go to and from home. While you are at it, do that intersection, too, with an overpass. Yes! to SH45!.	2014-08-12 15:57:52
Lenore	Ordonez	As a resident of the new Circle C community, Greyrock Ridge, I would like to see consideration made to our development which is currently located right off of 45-E. The entrance to/from our community is dangerous as it is, but if the interchange between 45 and MoPac is built as planned, I see us having even more challenges. It makes no sense to have a community entrance directly off of a 70mph highway. I'd be open to this project if we could have a separate exit ramp to our community's main street, Archeleta. Please consider. Our community is in the initial phase now, but we will have more than 300 homes at completion. Thank you.	2014-08-12 16:01:43
Carol	Burke	Please build SH45SW!!!! It is desperately needed to keep the Hays traffic off Brodie. We don't need speed bumps on Brodie....we need less traffic! Thanks for listening to my concern.	2014-08-12 16:05:56
Karla	Eaton	Please approve and move forward with all due haste on the SH45SW addition. This is desperately needed to get commuter traffic off of Brodie Lane and other local residential streets, for commuters headed to Mopac and central Austin from the southwest. Brodie Lane's speed already is well controlled with low speed limits and speed sensors. Brodie Lane does NOT need any speed humps. This will not discourage use of the road. The new road is what has been needed for well over a decade. Please get it built right away! PS I am a voter, and until my recent retirement, have been a regular commuter on Austin roads for 19 years.	2014-08-12 16:25:13
Larry	Fitzgerald	Build it	2014-08-12 16:29:09
George	Robbis	There has been so much building going on in Hays County it has created a real traffic problem on Brodie Lane. It is almost impossible to exit a subdivision to Brodie Lane during rush hour unless you have a traffic light. Since Brodie Lane cannot be widened, I think it is very important that S.H.45 SW be completed as soon as possible.	2014-08-12 16:38:12
Robyn	Scott	The traffic in southern Travis County has become increasingly dense with an ever increasing number of cars accessing MOPAC by going through neighborhood streets. This makes it dangerous for the children and pets in these neighborhoods along with decreasing the quality of life. While I agree that we need to be careful with development over our watershed, something has to be done about the traffic and SH45SW seems to be the best option. Please register my approval of this project. Thank you.	2014-08-12 16:47:56
tina	hoffman	PLEASE move forward with building SH45SW ASAP! Southwest Austin NEEDS this freeway in order to alleviate traffic on neighborhood roads. Brodie, Slaughter, 1626, and Davis Ln will all benefit greatly from this. I also theorize that this will greatly improve the flow of traffic on Mopac as a result of having a more efficient on/off access. In addition, the communities in Southwest Austin will have	2014-08-12 17:23:21

First Name	Last Name	Message	Date Created
		the opportunity to flourish from new business opportunities. As a Barker Ranch resident, I cannot wait for this project to be completed!	
Eddie	Mazurek	Please get 45 built to relieve the traffic on Brodie Ln.	2014-08-12 17:24:22
Diane	Summerfield	Please build SH45. We need traffic off the other roads. Thanks	2014-08-12 17:37:53
Cindy	Cowhig	I am very much in favor of the SH 45 project. Mopac is both a state highway and a loop and should be a major north/south corridor that connects with other highways. We must act now to improve traffic patterns by routing traffic to a major highway - it won't alleviate the impact traffic is having on smaller roads, but maybe it will keep it from getting worse. Since our area is served by only one interstate highway, we have to develop and utilize state highways. Please complete SH 45 - this long planned and much needed highway is crucial to our area.	2014-08-12 17:50:04
Bill	Burke	The sh45 extension between 1626 and MOPAC really needs to be built as soon as possible. In reality it should not be a toll road, which might discourage travel. Currently thousands of cars use Brodie,a two lane residential road, trying to get to MoPac.	2014-08-12 18:23:56
Bill	Burke	The sh45 extension between 1626 and MOPAC really needs to be built as soon as possible. In reality it should not be a toll road, which might discourage travel. Currently thousands of cars use Brodie,a two lane residential road, trying to get to MoPac.	2014-08-12 18:24:40
Linda	Reardon	As a resident of a far south neighborhood located off of Brodie Lane, I strongly support the building of the new proposed toll road connecting MoPac and FM 1626. The current traffic on Brodie Lane originating from Hays County is excessive. This heavy traffic should be on a major freeway, not a two lane residential street. As the current population of Buda and Kyle increases, this situation will become even more congested. It creates a safety issue for neighborhoods in the areas on Brodie Lane. Our commutes are long, frustrating and unnecessarily hazardous. The building of SH45 SW would alleviate the traffic and safety issues we must currently must endure.	2014-08-12 18:42:04
Pat	Crawford	I just want to submit my "vote" in favor of building SW45. I have lived off Brodie Lane in the Estates of Shady Hollow since 1992 and have seen the traffic increase at an alarming rate year after year. It has become a ridiculous problem. Brodie is meant to be a small neighborhood street, not a freeway. And it will only keep getting worse with the enormous continuing growth in Hays County. We need relief and need someone with the power and common sense to see that SH 45 gets built. Thanks.	2014-08-12 19:17:25
Tim	Coats	Please build SH45 as soon as possible. I am a resident of Oak Parke (Slaughter and Brodie) and the traffic on Brodie is horrible. The residents of Northern Hays county and the subdivisions on Brodie (Shady Hollow) have no alternative but to go up Brodie to get to Austin. During the school year, that makes if difficult for everyone - especially parents from my neighborhood that have to go down Brodie to take children to Baranoff Elementary and Bailey Middle School. Again - please build SH45 as soon as possible. Thanks, Tim Coats	2014-08-12 19:24:03

First Name	Last Name	Message	Date Created
jimmy	navarro	All very good data, facts and presentation. With the final leg of SH 45 SW segment in place for the last 20 years or so, this roadway has been in planning for this long or longer. With the explosive growth in the area, the lack of adequate access to MoPac AND I-35 - Why would the proposed design end at FM1626?!?! Why not extend this road from MoPac all the way to I-35? This would not only address the points you make in your proposal but it would additionally reduce traffic on I-35 from SH71 (Ben White Blvd) to Slaughter Lane. Also, if it is going to be a toll road, why not connect MoPac to I-35? What are you waiting on? For the traffic to get even worse? Make it 6 lane, 3 lanes in each direction!	2014-08-12 19:45:20
Raghunath	Rao	SH 45SW is long overdue. We have suffered for almost a decade with the traffic of Buda and Kyle into Austin coming through a small community road that is not even sufficient to handle the neighborhood traffic	2014-08-12 20:08:53
Raghunath	Rao	SH 45SW is long overdue. We have suffered for almost a decade with the traffic of Buda and Kyle into Austin coming through a small community road that is not even sufficient to handle the neighborhood traffic from this suburb. The environmental impact is a non-issue that has been blown up beyond proportion and funds that were allocated to this part of Austin have been moved up North skewing growth and impacting the whole Greater Austin community. Just observe the traffic and other development issues up north. It is high time that the balance is restored with the Austin-San Antonio corridor getting its due. Just do it!	2014-08-12 20:11:28
Chitra	Rao	SH 45SW is long overdue. We have suffered for almost a decade with the traffic of Buda and Kyle into Austin coming through a small community road that is not even sufficient to handle the neighborhood traffic from this suburb. The environmental impact is a non-issue that has been blown up beyond proportion and funds that were allocated to this part of Austin have been moved up North skewing growth and impacting the whole Greater Austin community. Just observe the traffic and other development issues up north. It is high time that the balance is restored with the Austin-San Antonio corridor getting its due. Just do it!	2014-08-12 20:11:51
Shrinath	Rao	SH 45SW is long overdue. We have suffered for almost a decade with the traffic of Buda and Kyle into Austin coming through a small community road that is not even sufficient to handle the neighborhood traffic from this suburb. The environmental impact is a non-issue that has been blown up beyond proportion and funds that were allocated to this part of Austin have been moved up North skewing growth and impacting the whole Greater Austin community. Just observe the traffic and other development issues up north. It is high time that the balance is restored with the Austin-San Antonio corridor getting its due. Just do it!	2014-08-12 20:12:14
Sankarsh	Rao	SH 45SW is long overdue. We have suffered for almost a decade with the traffic of Buda and Kyle into Austin coming through a small community road that is not even sufficient to handle the neighborhood traffic from this suburb. The environmental impact is a non-issue that has been blown up beyond proportion and funds that were allocated to this part of Austin have been moved up North skewing growth and impacting the whole Greater Austin community. Just observe the traffic and other development issues up north. It is high time that the balance is restored with the Austin-San Antonio corridor getting its due. Just do it!	2014-08-12 20:13:02

First Name	Last Name	Message	Date Created
sally	jacques	You consideration of building free main lanes and bridges at teh Mopac/Slaughter and Mopac/LaCrosse intersections and to expand South Mopac from Slaughter Lane all teh way up and across Lady Bird Lake ot Cesar Chavez with up to three additional lanes in each direction, is nothing more than an expanded and tolled Mopac/45SW loop that if built would convert Mopac from a local commuter highway to an alternative I35 fulling integrated into the interregional and interstate freeway system. An honest environmental analysis must look into this whole project rather than chopping it into four separate pieces. Withdraw the DEIS and republish when the required studies are completed. Otherwise the EIS and public comment process it nothing morethan a farce	2014-08-12 20:31:28
Aaron	Otstott	SH45 should not be built. This highway will exist over an environmentally sensitive region that recharges teh aquifer. We are in an extreme drought and just today we declared stage 4 water restrictions for teh aquifer for the first time ever. It is at the lowest level in 20 years. http://www.kvue.com/story/news/local/2014/08/12/edwards-aquifer-users-brace-for-water-restrictions/13941397/ This highway will not reduce the rechange (i dont believe) but it will potentially contaminate it. huge amounts of oil runoff will be added to an already stressed resource. I dont think we fully understand how much more pollutants will end up in the aquifer as a result. SH45 will also cause more traffic than it will releive. Studies have shows that those whom this highway is designed to help from the south near Buda will save a very small amount of time. Ive seen estimates at 3 minutes. But it is guaranteed to lengthen the commute of those already on mopac today. Mopac is already over capacity and adding more cars will make the problem worse. And if it were to somehow go against the surveys and speed commutes further south, this will only be temporary since it will casuse southern urban sprawl. We currently do not have urbar sprawl to the south due largely to the terrain and environmental sensitivity. opening this up will encourage more sprawl. Please do not approve SH45. I would like traffic releif like everyone else but this will not bring it.	2014-08-12 20:33:38
Toby	Burton	Build it now as currently planned; Brodie Lane needs the relief.	2014-08-12 21:00:58
Andy	Ivener	I support the building of this road as soon as possible.	2014-08-12 21:02:55
Helen	Miers	Some days it takes me 45 minutes to go from Mossback Ln to Slaughter Ln, about miles 2.5 . Traffic can be backed up all the way to Gattlingun from lights that are not timed well and streets that need lights and heavy traffic coming out of new neighbor hoods that do not have adequate exits to the east of Bodie Ln. . I want to please say that we need FM 1626 to be connected to MoPac. We have too much traffic coming fro 1626 that needs another way to MoPac. Thanks, Helen Miers	2014-08-12 21:10:07
Amanda	Sylvie	I am against the construction of SH 45 SW from 1626 to MoPac at this point in time due to the increased traffic and associated hazards that will accompany the completion of this new roadway. Once the entire SH 45 SW is completed to I-35, the traffic will make it impossible for commuters in SW Austin to reach downtown---it will be as bad as I-35 currently is. If the city is truly interested in achieving a workable and acceptable solution, they will bring light rail through this area rather than continually trying to push large roadways that will endanger families in neighborhood areas.	2014-08-12 21:21:25
Katy	Maffei	I am in support of building SH45 SW. I live in the Shady Hollow community and believe that Brodie Lane is dangerous due to the high volume of traffic. There are numerous wrecks and animal deaths that occur regularly. I have seen deer, dogs, cats and other animals killed while attempting to cross	2014-08-12 21:27:01

First Name	Last Name	Message	Date Created
		Brodie Lane. I can't cross the street without being in a car. I believe that Austin needs to be connected to Hays county via SH45 SW. thank you	
Robert	Dugan	I support building SH45SW. I live in the Shady Hollow area and believe thousands of cars idling while in gridlock have just as much of an environmental impact as building the road.	2014-08-12 21:34:23
sateesh	velmala	Hi, We need this highway built so that all the traffic from Buda will use it rather than the brodie lane causing nightmare for the people. Also ,people talking about preservation are you not seeing the development going around in Austin . With all the advancements in technology we can built a highway which will not effect environment .Please do not believe the propaganda of one community for the betterment of whole city .	2014-08-12 22:16:15
Mandy	Andrews	I want to voice my Strong desire for the development of SH45. I've been a resident of Barker Ranch in Shady Hollow for the past 10 yrs. I've watched the growth of not only of Shady Hollow but of Marbridge, Bear County, Bridges of Bear Creek, Olympic Heights & all of Northern Hays county. With growth comes new & greater traffic problems. South Austin's needs more roads in heavily populated/traveled areas running north & south just like what was done in North Austin with the growth of Round Rock, Cedar Park, Pflugerville, etc...Williamson County & Travis County. Kyle & Buda are growing rapidly & I'm certain a majority of those residents work in Austin. They come in on 1626 & take Brodie into Austin. My daughter goes to school at William Cannon & Brodie (5 mile). It takes us 30 mins to go 5 miles. During the weekends we can make the same distance in 10 mins. I'm not aware of any other neighborhood in Austin takes 20min just to get out of the neighborhood. All economist continue to say Austin will continue to growth. We need the addition of SH45 to accommodate all the new traffic south Austin will receive. Brodie Lane is a residential road (designed for) not a major highway. Thank you for your time. Mandy Andrews 512.695.4124	2014-08-12 22:20:01
Steven	Good	Please build SH45 SW. Some say SH 45 SW won't help rush hour, and to me that is fine. Rush hour will be bad no matter what, but we need alternatives for more times than just during rush hour. Saturdays at noon the flyover from EB 71 to SB IH-35 crawls past Wm Cannon and Slaughter Lane just as bad as when we had to use the frontage road. Those of us who could use MoPac to 1626 on a Saturday or a Sunday or any evening would gladly stay away for IH-35 for those who have to use it based on where they live. We Hays County folks need more options of how to get into/out of Austin.	2014-08-12 22:26:10

First Name	Last Name	Message	Date Created
John	Maffei	I support SH 45 SW I attended the public hearing at Bowie High School on July 29th. As you know the hearing was long and heated as both sides presented their opinions. I live in the Shady Hollow subdivision and purchased my home in 2009. Brodie Lane is highly congested and is dangerous to everyone who lives in Shady Hollow. I would like to first state why I support SH 45 SW: 1. Brodie Lane is currently the best access to Mopac. 2. The population in Hays county and South Austin continues to grow. 3. Brodie Lane is dangerous to the people who live in Shady Hollow and other nearby neighborhoods. 4. Brodie Lane is dangerous to the wild and domestic animals in the area. 5. Austin was recently shown to be the second worst traffic congestion by a national publication. 6. Austin will continue to grow due to a high tech sector, quality of life and the University of Texas. 7. Austin is the only major metroplex in Texas that does not have a loop 8. Brodie Lane has numerous water crossings that collect rain with dangerous particulates into our water. 9. Brodie and Slaughter Lane are heavily congested as drivers access Mopac. 10. There are only four options for traffic to travel from South Austin and Hays country to Austin and Travis county, IH 35, Manchaca, 1st Street and Brodie Lane. 11. Fire and EMT services in Hays county and Travis county need quick and efficient access to each other in times of needed assistance. In Summary: The population of Austin and the surrounding areas will continue to grow and put even more stress on our traffic system. We all know that IH 35 is very congested and cannot handle any more traffic. Manchaca and 1st street are not main roads and are not ideal. This is due to the fact that Mopac is absolutely necessary to traffic flow on the west side of Austin. This is exactly why the amount of traffic on Brodie has continued and will continue to increase. Brodie Lane is the only real option for getting to Mopac from Hays county and South Austin. Conclusion: Mopac must be connected to HW 1626 and SH 45 SW is the only viable option. I listened to many people at the hearing who did not support SH 45 SW. I would like to present a counter position to each of their opinions: 1. It will create a loop around Austin. Yes it will, we need a loop see #7 above. 2. It will pollute our water supply. The environmental study shows that 90% of the runoff will be removed. This is more than the 80% according to state law and way better than the 0% that is currently flowing from Brodie Lane into our water supply. See #8 above. 3. It will add more traffic to Mopac Drivers are already accessing Mopac, they just have to go via Brodie Lane. See #9 and #10 above. 4. Deer and other wildlife will be killed attempting to cross SH 45 SW. Deer and other wildlife as well as peoples pets are being killed every day due to the high traffic on Brodie Lane. See #3 and 4 above. 5. Speed bumps on Brodie will solve the problem. This idea will only add to the problems by slowing down the traffic. We need an efficient traffic system in Austin that will support the growth to come. See #2, #5, #7 and #10 above. 6. IH 35 is a solution. The one needs no response other than "Have you driven on IH 35 lately"?	2014-08-12 22:31:07
Rebecca	Coffield	We need the SH45SW to take the additional traffic off of Brodie/Slaughter. When the SH45SW is built a 3rd lane of traffic need to be opened up on Mopac between William Cannon and Slaughter both North and South bound. This is a major problem now and will only get worse when the SH45SW opens up if an additonal lanes isn't added.	2014-08-12 23:04:57

First Name	Last Name	Message	Date Created
Brian	Regan	My name is Brian Regan and my wife and I live at Greyrock Ridge. This development is off of Archeleta Boulevard, which is right where Mopac and 45 meet. I realize that a lot of focus for this project has gone into serving those of Hays County to make Austin more accessible and alleviate traffic on other local roads. While I agree that there will be benefits to building the new section of 45, I ask that the developers and planners consider the residents of Greyrock Ridge when making future design decisions. I was quite surprised to see the use of overpasses in the proposed plans, as there are currently no overpasses south of William Cannon on Mopac. If the road is built I ask that the usage of overpasses be reevaluated, as the idea of having them visible from our home is quite daunting. If an overpass is used, I hope that the height and current tree cover are taken into consideration for both aesthetic and sound concerns. Additionally, the location of the proposed entrance and exit ramps appears to make even the current stretch of 45 inaccessible to the residents of this community, as the existing left turn to access 45 West seems to be deleted in the plans. Please be considerate of the families in Greyrock Ridge, who would be the first that drivers would pass upon entering Travis County from the new section of 45.	2014-08-12 23:08:04
Michael	Swartz	The project should not proceed without a firm plan in place to upgrade the intersections at Loop 1 and LaCrosse Blvd, and Loop 1 and Slaughter Lane. There are currently traffic lights at both intersections and there are considerable backups today during rush hours, and often during non-rush hours. The additional traffic fed from/to SH 45SW would significantly exacerbate the problem. Not only will it harm commuters already using those intersections but it would seriously impact the projected time savings for users of the new road. Construction of SH 45SW should not proceed until it can be coordinated with the construction of overpasses (or underpasses) at those intersections.	2014-08-12 23:15:28
Noel	Candelaria	I live off of Brodie in Barker Ranch at Shady Hollow, and I am concerned with the amount of heavy traffic on Brodie between Slaughter and 1626 in the morning and evening. I have spent up to 25 minutes traveling the up Brodie to Slaughter. We need to build SH 45SW to move as much traffic out of a two lane road that was not designed to handle that much traffic during rush hour. I am afraid of what is to tome with additional subdivisions south of 1626 along with the current expansion of 1626 will do to additional traffic on Brodie. I have a difficult time turning into my street in the evenings with the southbound traffic as I try to turn going up Brodie. We have had a couple of cars drive extremely close to the sidewalk where we have waited to cross the street at the crosswalk and the cars going around the car waiting to turn drive close to me and my children waiting at the the light.	2014-08-12 23:36:36
Josh	Hofstetter	Brodie is nearly unusable and it's getting worse by the day, SH45 needs to be built NOW. My vote, and future votes are hinging on who does and does not vote for this, I know many people that feel the same way. That's how important this issue is for me and my neighbors.	2014-08-13 01:51:14
Bette	Whalen	As a resident in Sendera between Slaughter Lane and Davis, I deal every day with the traffic that has come up Brodie to either Slaughter or Davis to access Mopac in the morning - these commuters do not abide by speed limits and cut through our neighborhood as well. I live on a corner so I am exposed to this unnecessary traffic from people looking for ways to get to Mopac. By building SH45, this traffic will have a more direct route to Mopac.....it will not increase Mopac traffic at all since that is the destination of these drivers anyway. PLEASE build SH45!!	2014-08-13 07:45:37

First Name	Last Name	Message	Date Created
Paul	Pousson	I have lived in Barker Ranch at Shady Hollow on Brodie Lane for 12 years. I've watched the speeding, traffic and congestion on Brodie get progressively worse over the years. This traffic is coming from FM1626. SH45 would minimize the traffic, congestion and speeding through this residential area on Brodie, and mitigate a significant safety risk to residents, including children in the area. All reports I've seen indicate SH45 can be built without adversely impacting the environment. The project must proceed or the aforementioned safety risks will get even worse.	2014-08-13 08:02:49
Cesar	Dominguez	I completely support the construction of SH 45 SW. As a Southland Oaks resident, I have to struggle every day with heavy traffic on Brodie Lane, to a point where I prefer to drive to Manchaca road just to get out of my neighborhood. Brodie lane is a small road, it does not appear to be appropriate for such a large amount of traffic. While I understand that a portion of the traffic comes from our own neighbors, I do believe this new road will provide a much faster and less stressful commute for people coming from 1626, and at the same time, will speed up our own neighborhood traffic and allow us to drive our kids to school in half the time. Thank you	2014-08-13 09:11:57
Hope	Phillips	Public Hearing July 29, 2014 Comments Regarding SH45SW. I am a longstanding member of The Wildflower Center and frequent visitor. I have volunteered to seed native grasses on City of Austin water quality protection lands, a $200 million investment in our future. SH45SW would intersect these lands one half mile south of the Wildflower Center. Noise and light pollution alone would threaten the entire area. Silence and wild land determine what is aesthetic here. TxDOT must study harm to the Wildflower Center and public parks and preserves from air, noise, light and visual pollution, the result of an ill-advised project like SH 45 SW. SH45SW is a political highway championed by Commissioner Daugherty who understands and values water quality protection land much less than his predecessor, Karen Huber, who rightly opposed it. Hays County Commissioners, who are now also pushing SH45SW in conjunction with their expansion of FM 1626, know and value water quality protection lands even less. Furthermore, they are only willing to pay for a fraction of what SH45SW would cost. The July 29 public hearing was a propaganda effort. TxDOT and the Mobility Authority tout a thousand-page Draft Environmental Impact Statement which is unfinished. The Geologic Assessment is pending. A Water Pollution Abatement Plan, which would have to be approved by the Texas Commission on Environmental Quality before beginning the project, has not been done. Crucial studies on caves, sinkholes and other aquifer recharge features in the right of way remain. How can the Draft Environmental Impact Statement determine impact and evaluate alternatives without the necessary studies being completed? TxDOT should withdraw the Draft and republish when it is complete. Otherwise the public comment process is meaningless and violates TxDOT rules. Furthermore, TxDOT should study the whole project of which SH 45 SW is only one section.	2014-08-13 09:30:35

First Name	Last Name	Message	Date Created
Susan	Burton	We need a good long term solution to get people from Hays County who work and shop in Austin to MOPAC. Going down Brodie Lane or even Manchaca (Which no one is going to do anyway) are not long term solutions. Austin and TXDOT have built toll roads for every other bedroom community to access Austin. Why should Hays County be treated any differently. Buda is the fastest growing city in Texas right now! I support 45SW and ask that you build it NOW! We bought our home in Shady Hollow with the promise and expectation that traffic relief was coming. Please fulfill that promise! We have waited long enough! The same city council that "disapproves" of this road being built keeps approving more homes and businesses being built in the direct area of 45SW! If they were so worried about the environment then those housing communities would not have been approved. They are talking out of both sides of their mouths! 45 SW can be built in an environmentally responsible way and should be built NOW! Thank you!	2014-08-13 09:40:41
Larry	Sherman	I have been a resident of Shady Hollow for 28 years and I am no longer able to turn onto Brodie Lane because of the constant flow of traffic, day and night. We desperately need the new SH45 built to relieve this traffic congestion. Keep Brodie Lane local, let's get SH 45 built.	2014-08-13 09:58:43
Bill	Fry	I would like to express my support for the construction of SH45SW. We live close to Mopac and Slaughter and frequently travel to Kyle via Brodie and 1626. That route is a traffic nightmare. Completion of SH45SW will allow us to get on Mopac then 1626, a much faster route. We'll save gas and save time. Let's build it!	2014-08-13 10:05:26
Gaby	Fuentes	The toll road needs to be built. Hays county will continue to grow and they will continue to work in Austin. They need a way to get to Austin without coming through our neighborhoods. Austin is very behind in transportation issues. You finally have a project that has support from the constituents in the area so please build it.	2014-08-13 10:27:38
Laurie	Dries	Dear TxDOT and CTRMA officials: Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the long-term future effects on water quality and quantity. If water resources are not protected, the current growth in the Austin population will ultimately cease and reverse direction. Nobody chooses to live where water is scarce or unavailable. At which point this and other highways that only minimally improve travel time by personal vehicles are useless. It's time for Texas to recognize that the only long-term solution to increased commuter traffic is to improve public mass transit (train, bus, etc.) between suburban and inner-city areas. Commuter traffic problems in Texas are not novel; every growing city has experienced them. Let's make an effort to learn from the mistakes and successes of other large cities worldwide. The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied more objectively before building any of the 4 projects in consideration. The Austin community deserves, and sound planning requires, that the whole long-term picture be considered. This should include thorough analysis of viable alternatives that do not create incentives to increase traffic on Mopac. Improvement of mass transit options from outlying areas into Austin should be a major component of this analysis. Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac, do not encourage more suburban development, both of which threaten the quantity and quality of water in the Barton Springs Edwards Aquife. We all	2014-08-13 10:53:58

First Name	Last Name	Message	Date Created
		depend on that aquifer for life. Please do not compromise my survival to increase convenience of automobile travel into and around Austin. Thank you for your consideration.	
Rob	Baxter	Please postpone the submission of the present EIS. It is invalid at this time due to lack of information. Also, WHY has WYLDWOOD Lane not been looked at as a solution for Shady Hollow. For a few million dollars, instedd of 100 million. this road could be improved to 4 lanes, connected to MOPAC and two things would happen. 1) It would halve the amount of traffic going west or south at Slaughter and Brodie while 2) Doing so without adding one more car to Mopac or Brodie Lane. This makes FAR more sense than a 100 million dollar tollroad. Rob Baxter; Pres. The Friendship Alliance of Northern Hays County www.friendshipalliance.org	2014-08-13 11:01:27
Ken	McDowell	I am a new resident in Reunion Ranch, which connects to Loop 1 via FM 1826 and SH 45SW. While I understand why many drivers who use FM 1626 to access Loop 1 and I-35 desire the proposed extension of SH 45SW to 1626, I do not believe the extension will alleviate traffic congestion in the long-term, especially if SH 45SW is further extended to connect to I 35. The traffic mess on Brodie and Slaughter (and eventually I-35) will simply move to Loop 1 and ensnare drivers who live west of SH 45SW as well as those who live east of SH 45SW. I think funds could be better spent on projects that actually alleviate traffic congestion (like light rail or adding more lanes) instead of using funds to simply move the traffic problem to another location.	2014-08-13 11:52:17
Wallace	Reeves	Between City of Austin-approved development along Brodie and Slaughter Lanes and increased traffic from Hays County, the neighborhoods along Brodie Lane are unsafe for our children AND adults and traffic jams are a nightmare. The solution is to build SH 45SW and toll it at a reasonable amount so that traffic is diverted. The draft EIS appears to take the need for environmentally sensitive construction of SW45 into account. That road, and many others, should be built as quickly as possible and with all environmental protections. There are no other solutions for allowing our neighborhood (Shady Hollow) and others to have their residential street returned to them for neighborhood use. The intersections of MOPAC at Slaughter Lane also need to be improved as the traffic currently getting on to MOPAC at Slaughter and Wm Cannon will be getting on farther south.	2014-08-13 11:57:46

First Name	Last Name	Message	Date Created
James	Clary	I do not support the construction of SH-45SW as proposed in the Draft EIS for the following reasons. 1. It does not meet the stated need to reduce congestion in Austin. It merely shifts congestion from one set of roads, Manchaca Road and Brodie Lane, over to MoPac South, which is already extremely congested. Austin needs a regionally based solution to traffic congestion and this DEIS is not that. In addition, by using SH-45SW to connect FM 1626 to SH-45W, a new route that connects IH-35 to MoPac will be created. This in turn will likely serve as a bypass to shift even more traffic off of I-35 to add to congestion on MoPac South. 2. It would add more traffic noise to MoPac and decrease my property values. I live in South Austin, approximately 1/2 mile distant as the crow flies from the intersection of MoPac and Southwest Parkway. Traffic noise from MoPac is already a problem for the neighborhood and will only get worse with the addition to more cars to the roadway, especially trucks traveling at highway speeds. Shifting truck traffic onto MoPac South will only make it worse. The DEIS does not consider this cumulative impact on neighborhoods that border MoPac South. It is a fact that proximity to traffic noise had an adverse effect on home values. We bought our house in 1989, long before MoPac was extended southward to Circle C. Since then, and with the extension of Southwest Parkway feeding off of MoPac, traffic noise has only increased to the point where traffic noise is a constant problem. As a result, our neighborhood, Travis Country, has lost its appeal to many as a tranquil place, and our property values suffer. None of these kinds of long term, cumulative impacts to existing neighborhoods along MoPac South are addressed in the DEIS. I request that this issue be addressed and mitigation for noise abatement be considered. 3. Other modes of transportation are not promoted by the DEIS. The DEIS proposes to solve the traffic problem by adding more cars to MoPac South which will increase congestion on that roadway. This action does not solve the overall problem of traffic congestion in south Austin, which is only going to get worse as the area is developed. Minimally, increasing bus transportation options, bike paths and even light rail should be part and parcel of the proposed DEIS. These alternatives were dismissed in the environmental study but should be included. I appreciate the opportunity to comment on the DEIS and thank you for your attention to this letter.	2014-08-13 12:19:22
Bill	Bunch	Please accept, consider, and respond to the following comments of Bill Bunch, Executive Director, Save Our Springs, on TxDOT's and CTRMA's Draft Environmental Impact Statement on the proposed SH 45 SW toll road (DEIS). 1. These comments are offered in addition to the previous comments and requests filed by Mr. Bunch, Save Our Springs Alliance, and the Keep Mopac Local coalition. These comments add to and do not substitute for those previous comments. 2. The DEIS almost completely ignores the early input provided by Keep Mopac Local representatives and also ignores the early input from the City of Austin, including specifically the City's October 8, 2013 comments. 3. The DEIS consists almost entirely of unsupported assertions and conclusory statements, wholly lacking in supporting evidence or analysis. Much of the rest contains promises or suggestions to, in effect, "trust us to figure it out later and do the right thing." This approach violates common sense and TxDOT rules to actually analyze with available information and technology the likely impacts and to undertake required environmental studies prior to publishing the DEIS so that the public may comment in a meaningful way on the relevant information and studies. Normally, the DEIS appendices would contain the detailed studies, or summaries of those studies. Instead, the studies are not yet done, or the appendices do not contain or summarize the supporting studies but merely repeat the unsupported assertions of the main document. Several of the appendices are	2014-08-13 12:19:48

First Name	Last Name	Message	Date Created
		labeled as “technical reports” on specific issues, but these technical reports contain the same unsupported assertions and generalizations without support from an actual analysis based on data and the current best available science and technical information. This approach violates TxDOT and NEPA rules and results in a process and in conclusions that are purely arbitrary. Despite its length, the DEIS has minimal actual content. 4. The National Environmental Policy Act (NEPA), NEPA rules, TxDOT rules, and common sense require that the proposed SH 45 SW toll road link from the southern tip of Mopac to FM 1626 be considered and analyzed as only one part of the larger SH 45 SW/Mopac loop project (that also includes, at minimum, the FM 1626 spur connection). These other pieces of the project are being pursued at the same time, depend on each other for their justification, functioning, and financing, are being handled by the same teams of consultants and project sponsors, and have impacts on the same highly vulnerable resources (most notably the Barton Springs Edwards Aquifer, Barton Springs, the Barton Springs salamander, the Austin blind salamander, and caves and cave-dwelling species of the Barton Springs Edwards formation). The effects and alternatives of these pieces of the actual “45SW/Mopac loop” project must be analyzed at this project level to make any sense or have any validity in terms of logic, transportation planning, or environmental planning and compliance. For key issues like evaluating impacts to endangered species and water resources, it is also necessary to consider impacts from the Oak Hill “Y” project, located in the Barton Springs contributing and recharge zone. 5. CTRMA and TxDOT cannot escape the reality that they are pursuing a system loop and not multiple, separate projects that have no relationship to each other. CTRMA and TxDOT cannot avoid the conclusion that their activities will result in “take” of multiple endangered species that must be permitted under the Endangered Species Act by the U.S. FWS, and that such permit must be one overall permit rather than as multiple permitting processes. The “take,” and potential jeopardy, of these species cannot be ignored by seeking to segment and minimize the impacts of purportedly separate actions. 6. The need to study the 45SW/Mopac loop project as one project is enhanced by the dropping of plans to build a western “Outer Loop,” which would mean that Mopac becomes the default western loop. Current circumstances, with limited connection at the southern end of Mopac, means that Mopac operates as local commuter highway. Building the proposed SH 45 SW would convert Mopac into an alternative to I-35, or I-35 West, fully integrated into the interstate and interregional transportation network. Building just the first phase of SH 45 SW, combined with the now-under-construction expansion of FM 1626, would add substantial traffic to Mopac, thereby reducing the viability of options that would keep Mopac as more of a local commuter highway and/or limit the expansion of Mopac so as to avoid costs and other adverse community and resource effects. 7. The selection of the “Area of Influence,” or AOI, and other potential impact areas is arbitrary and capricious. The AOI “box” was drawn without respect to watersheds, known habitat areas, “travelsheds” or other reasonable measure. The AOI for water quality and water recharge certainly should include the entire Barton Springs Edwards Aquifer and Barton Springs. For flooding issues it should include downstream to the flood prone areas on Onion and Bear creeks downstream. For indirect and cumulative effects of induced growth, and other related and connected road building actions, it should extend significantly farther north, south, west and east. For example, readily available transportation and accepted transportation research would predict induced development and induced traffic significantly farther south along the FM 1626 corridor than	

First Name	Last Name	Message	Date Created
		was analyzed. 8. TxDOT rules require that supporting studies be summarized if not included entirely in the appendices of the DEIS. Relevant studies have been omitted, including, for example, studies on soils and geology specific to the 45SW proposed project by Woodruff and Wilding; studies on Mopac water quality by Barrett and others; and studies on the previous 45SW EIS from the 1980s. SOS Alliance does not endorse these studies, but they are required to be disclosed and summarized in the DEIS process. Other studies are not summarized because they have not been completed, including the Geologic Assessment required by TCEQ Edwards Rules. The GA is a critical part of the process because it must summarize the results of the field surveys for karst features and the proposed measures for avoiding these features and minimizing and mitigating harm to the quality and quantity of rainfall runoff. 9. TxDOT, CTRMA, and some Travis County officials made a great deal of the "greenway" challenge competition held to solicit competing proposals for building a so-called "green" SH 45 SW. Yet these proposals and the resulting "winning" design are not mentioned or summarized in the DEIS. Nor is there any description of how any "green" designs that were proposed will be incorporated into the planned roadway design. 10. Without performing the GA in advance, and disclosing its methods and results, it is impossible for TxDOT to make the assertions that both runoff and recharge will be managed to protect the Edwards Aquifer. It also makes it impossible to comply with DEIS rules that call for the right of the public to provide comment on these studies as incorporated in the DEIS. For example, without knowing the spacing of karst feature survey transects, the level and methods of effort to identify and characterize karst features on the proposed ROW and adjacent areas that will be impacted, it is impossible for TxDOT to know what the impacts will be and impossible for commenters to provide input on TxDOT's evaluation of karst features and proposed methods for managing impacts to those features, to the aquifer, and to Barton Springs. 11. The DEIS takes the approach that the same level of development will take place in the area whether the road is built or not. This conflicts with common sense. It conflicts with TxDOT representative statements in meetings with technical advisors from the City of Austin and other agencies that the road is being built to serve new development. It conflicts with a vast body of transportation and planning literature that now allows transportation planners to predict levels, locations, and resulting traffic from new development induced by the construction of a new or expanded road. The DEIS is arbitrary and capricious by ignoring this information and is deficient in failing to meaningfully evaluate the indirect effects of induced development. 12. The DEIS ignores any sense of how timing of the project affects the environment, traffic flow, and the consideration of potential options. There has for many years been, in effect, a race between protection and development of land over the Barton Springs Edwards aquifer watershed in the area of the proposed SH 45 SW project. The many years that 45SW has been shelved allowed the City of Austin and others to purchase for protection many thousands of acres of land that had be slated for development (and for which many observers insisted development was inevitable). This has greatly reduced the previously perceived and predicted need for 45SW and for expansion and extension of other roads in the area (e.g. the proposed extensions of Mopac and Escarpment south of 45SW). Delaying 45SW another 10 years, for example, would similarly allow for a more conservation land acquisition, opportunities that will be lost if 45SW is rushed ahead at this time. 13. The DEIS predicts traffic impacts on Mopac and other area roads assuming road improvements not yet built or funded will be built and funded as called for	

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		the in CAMPO 2035 plan. As with the potential environmental impacts, this ignores the real world effects of timing and what will happen to traffic on Mopac and other area roads if 45SW is built as proposed and on the proposed schedule and prior to the proposed improvements to Mopac and other roads being completed. The DEIS studies ignore these immediate impacts, which may last for many years or perhaps many decades if the proposed expansion of Mopac is delayed or determined to be undesirable or infeasible. While it is appropriate and necessary to look at the cumulative impacts of the proposed expanded transportation network, this does not excuse the necessity of analyzing the impacts without, or in advance of construction, of those other proposed expansions and extensions. 14. The DEIS fails to fully explain or analyze the potential and likely impacts of building the proposed toll road up on a bed of fill material to heights as great as 25 feet as a method of reducing cutting down into the karstic Edwards limestone. The amount, source, and chemical qualities of the fill are not mentioned. The impacts of mining the fill material or transporting the fill material to the 45 SW constructionzone are not analyzed. The potential for introducing contaminated fill and invasive species is not mentioned or analyzed. The threat of tawny crazy ants from bringing in fill and from construction of the project is not mentioned, though the tawny crazy ant has already caused damage to protected cave fauna in Travis County. Red-imported fire ants and zebra mussels could also be introduced to the area, causing severe impacts to native species, species of concern, and listed species. 15. The elevation of the proposed roadway on fill will significantly increase noise and visual impacts on nearby residents, protected recreational and wildlife conservation lands, and the Lady Bird Johnson Wildflower Center. The impacts are not disclosed or analyzed. 16. The impacts of imported fill, and the compaction of this fill on standard three-to-one slopes will expand the footprint of the on the recharge zone and natural resources substantially. These are all ignored. 17. Setting aside the issue of elevating the roadway on fill, the DEIS fails to analyze potential visual impacts on key visual receptors, including the Lady Bird Johnson Wildflower Center, or on nearby residents as a result of lighting the roadway and lighting the elevated bridges and flyovers that are part of the project. 18. Increased traffic and increased truck traffic on Mopac caused directly by the proposed Phase I SH 45 SW proposal will harm the tranquility, enjoyment, and use of the gardens, grounds and observation tower at the Widflower Center. These noise impacts, as with the visual impacts, are not addressed in the DEIS. 19. The “Appendix I Cumulative Impacts Technical Report” violates both NEPA and TxDOT guidance on a many levels. A few of these violations are noted here. If the comment period is extended or the DEIS is withdrawn and reissued additional comments will be given. 20. The App. I “methodology” says it is based on “planner interviews” and other vague terms that do not represent science based methods called for by NEPA and TxDOT guidance. See I-p.75) 21. App. I says it is referencing applicable NEPA and TxDOT guidance, at I- p2-3, but the critical component of this guidance and the essential element of cumulative effects analysis is to look at “combined” effects of the proposed project and other reasonably foreseeable actions. Yet repeatedly App. I states that the “incremental” harm from the project (not the combined impact) is small or nonexistent. See e.g. App. I p. 76, “incremental” impacts on listed endangered salamander species expected to be “negligible.” 22. App. I acknowledges that impervious cover levels in the Barton Springs watershed and the Bear Creek watershed are approaching threshold levels of 10 percent identified by USFWS as causing degradation to aquatic ecosystems, but App. I does nothing to analyze the direct and	

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		indirect effects of all of the projects planned and underway by TxDOT and CTRMA in the Barton Springs and Bear Creek watersheds on impervious cover levels in these watersheds. 23. App. I acknowledges that water quality is degrading at Barton Springs and in Edwards wells as a result of urbanization, but makes no meaningful effort to evaluate the cumulative impacts of all of the proposed highway projects, related development, wastewater treatment facilities, and other pollutant sources on water quality. 24. Similarly, App I acknowledges that nutrient pollution (leading to algae blooms and reduced dissolved oxygen) and sedimentation are causing pollution problems at Barton Springs, but makes no effort to estimate potential increases in these pollutants from TxDOT and CTRMA planned projects and other planned and reasonably foreseeable projects in the Barton Springs watershed. 25. Similarly, App. I does not look at what these cumulative pollution impacts mean for take, survival, and recovery of listed aquatic species in the Barton Springs Edwards Aquifer and Barton Springs. 26. The DEIS asserts there will be no take of Golden-cheeked warblers, yet GCWs have been sighted on and immediately adjacent to the proposed SH 45 SW right of way, and TxDOT funded research on GCWs predicts that many GCWs will be taken by the direct destruction of GCW habitat located in the proposed ROW or by the direct degradation of GCW habitat adjacent to and fragmented by the proposed 45SW Phase I. Similarly, the DEIS and App. I ignore the indirect impacts to GCWs caused by development associated with the road and as predicted by this GCW field research and habitat analyses. 27. The DEIS overlooks, minimizes or misstates science and available information on the harm that will be caused by the proposed roadway on Flint Ridge Cave. The DEIS dodges a meaningful analysis of potential impacts to Flint Ridge Cave by failing to complete necessary geological and hydrological studies, by failing to locate the proposed roadway along the right of way, by failing to specifically describe and locate proposed mitigation, and by failing to describe how long-term maintenance and operations of mitigation measures will be assured. By personal communication from City of Austin technical staff, new caves have been found and the extent of known caves have recently been expanded. These caves extend within and under the proposed right of way and should be fully explored, described and evaluated in a re—issued DEIS. 28. The selection of “purpose and need” criteria that was unduly narrow dictated that all alternatives that were something other than building at road from FM 1626 to the southern tip of Mopac were effectively excluded as potentially viable alternatives. This violates both NEPA and TxDOT standards. An honest analysis of alternatives would and should be carried out by an entity that does not have, as its number one mission, building highways or toll roads. Such an analysis would look more closely at alternatives that were “shared solutions” to assisting commuters and improving traffic flow in the area and not single-bullet “build a road” schemes. A “shared solutions” alternative would include: providing commuter bus service to the area; improving traffic flow on Brodie, Manchaca, Slaughter and I-35; building Lone Star rail; and expanding tele-commuting support and other actions that reduce vehicle miles travelled (and thus long-distance, single occupancy vehicle commuting). 29. The DEIS should acknowledge and estimate with accepted prediction tools that the proposed SH 45 SW Phase I will encourage long-distance commuting and, in many respects, make traffic worse for existing residents and commuters. 30. The DEIS violates TxDOT rules by failing to summarize and disclose how “traffic and revenue” modeling studies were undertaken, with sufficient detail that the inputs and results of these studies can be fully understood and critiqued by interested persons. 31. Similarly, the noise impact analysis	

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		violates TxDOT rules by failing to reveal the inputs and methods to the study, including, for example, the elevations of the proposed roadway and interchanges, the assumed car and truck traffic levels at peak hours, and assumed travel speeds. 32. With additional time, I would provide further comments. Please reference comments from the City of Austin, Dr. Lauren Ross, Dr. Hayley Gillespie, Taylor Nelson, Mike Brown, Norm Marshall, and Adam Abrams for additional concerns and information shared by me and the Save Our Springs Alliance.	
T	D	I am for building SH45SW. This was a road that has been in the works for many years. If built right, it will help with the environment by not have so many cars stopped on Brodie, along with driving through a neighborhood.	2014-08-13 12:25:20
Keith	Cantrell	I just want to voice mail support for building the much needed connection from South Austin to I-35. This will allow residents from South Austin to not have to drive North to 71/290 to eventually go South on I-35 (e.g. to go to San Antonio. It will also help to reduce the traffic on residential feeder roads (Brodie, Manchaca, Slaughter) and put it where it belongs, on a major highway. Note that after this road it built, it will be imperative that the under passes be built at La Cross and Slaughter as soon as possible.	2014-08-13 13:07:05

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Jon	White	Travis County TNR Staff Comments Dear Sir or Madam: Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the proposed State Highway 45 Southwest (SH 45SW) in Travis and Hays Counties. Please see the attached comments prepared by staff of the Travis County Department of Transportation and Natural Resources. We look forward to continuing to work with TxDOT, CTRMA and other project stakeholders to ensure the best possible outcome for this project. In particular, we anticipate extensive collaboration to meet obligations described in the interlocal agreement between CTRMA and Travis County to consult with the United States Fish and Wildlife Service on protections for Flint Ridge Cave. Sincerely, Steven M. Manilla, P.E., County Executive Travis County TNR Jon A. White Director, Natural Resources & Environmental Quality Division Travis County TNR General Comments • The Travis County Commissioners Court approved support of the SH 45 SW project by a resolution of October 22, 2013, and by approval of an Interlocal Cooperation Agreement to construct the project between Hays County, Travis County, and the Central Texas Regional Mobility Authority on March 18, 2014. • Travis County and the Central Texas Mobility Authority (CTRMA) have emphasized that the project will employ the best and most environmentally sensitive design and implementation. To support this, the design for the project should include a clearer exposition of and commitment to an elevated level of environmental management. The Environmental Commissioning process used by the City of Austin in its Water Treatment Plant 4 project serves as an example that may be followed. • The protections described in the DEIS suggest that they provide superior protection for Flint Ridge Cave. The Balcones Canyonlands Conservation Plan (BCCP), a federal Endangered Species Act Section 10A permit held by Travis County and the City of Austin, requires this cave to be protected. The Interlocal Cooperation Agreement between Travis County and CTRMA requires consultation with the U.S. Fish & Wildlife Service (USFWS) to determine what, if anything, is necessary to avoid Travis County's violating the BCCP permit. To achieve this, environmental management via best management practices (BMPs) for design, construction and operations may need to be carried out in a manner even more protective of Flint Ridge Cave than is described in the DEIS.The purpose of the EIS to fully describe the project's environmental impacts and consequences. Accordingly, it needs to address all BCCP issues. The consultation process with USFWS described in the interlocal agreement between CTRMA and Travis County will be important in addressing this issue. • Through consultation with TxDOT, we are advised that TxDOT has a record of success with roadway projects	2014-08-13 13:15:45

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		passing over and near sensitive karst features like Flint Ridge Cave that are, like other BCCP karst features, subject to USFWS jurisdiction. TxDOT has established a “standard of care” in their projects that has provided adequate protection as determined by USFWS. This “standard of care” should be fully elaborated in the FEIS. It should be explained, documented and linked to design, construction and operations of the current project. • The DEIS describes an extensive collection of BMPs that are intended to provide for protection of surface and groundwater resources and provides for an Environmental Compliance Management Plan (ECMP) with an on-site compliance manager. The BMPs and ECMP in the DEIS are not yet organized into a clear, coherent strategy. The essential features of the proposed environmental protections and the implementation procedures should be more fully and cohesively elaborated in the FEIS. The framework for how these protections and procedures will be implemented in design, construction, and operations should be described with specific clarification and commitment that specific details will be fully and comprehensively addressed at each stage of project development, i.e. design, construction and operations. • To the County's knowledge, USFWS has never required a subsurface drainage study for a road project potentially affecting a BCCP cave. However, the City of Austin is currently conducting such a study for Flint Ridge Cave. The risk that the study will result in major project redesign appears extremely low. However, because the project sponsors are committed to the highest levels of environmental protection, final project design should remain contingent on the final result of the study. The FEIS should reflect that the final design and construction of the project will be adjusted as appropriate to reflect any relevant findings from that study. Detailed Comments by DEIS Section EXECUTIVE SUMMARY: General: The DEIS doesn’t mention Travis County as a regulatory authority in the area such as our MS4 designation; our roadway operation and maintenance responsibilities for non-State/CTRMA roads affected by the project (Bliss Spillar); and our water quality protection rules. ES.3 COMMENT: We suggest including “improved safety” in the first sentence, as a project purpose. ES.4 Preferred Alternative, states that the Build Alternative was identified as it excludes frontage roads throughout the project’s length. COMMENT: Are there any other aspects of the short segment between Bliss Spillar and FM 1626 not identical to the long segment between Bliss Spillar and Loop 1? If so, they should be pointed out. The Shared Use Path is shown to have its own alignment. Could the alignment be established closer to the road (especially at the bridge crossing) to help minimize disturbance of the land? ES.5 Build Alternative Land Use: The seventh sentence states the lack of frontage roads and the limited number of access points constrain opportunities for potential development immediately adjacent to the roadway. COMMENT: Could tolls be added as a factor? Will development adjacent to the road between FM1626 and Bliss Spillar be constrained or precluded? We suggest using the word “preclude” instead of the word “constrain.” We suggest revising the last sentence to read “The proposed	

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		project's influence on development is not anticipated to be significant, especially given the Austin area's high rate of growth overall and the transportation improvements such as the widening of FM1626 already occurring in the study area." Could it be said that full control of access, as is proposed between Loop 1 and FM1626, will result in less impact than partially controlled access as has been experienced adjacent to the segment between FM1826 and Loop 1? Socioeconomic Resources: The third sentence in the first paragraph lists reasons why the area transportation network would improve if the proposed roadway is built. COMMENT: Can "improved safety" be added? The last sentence in the first paragraph states that the proposed project may also connect to a trail system and bike-accessible shoulders on FM1626. Do the trail and bike-accessible shoulders currently exist? We suggest adding that the proposed project offers some protection from wildfires by providing a wide fire break, providing access to the area for fire fighters and access for wildfire risk-reduction projects. Could it be added that the project will improve emergency response times in this area? Air Quality: The second sentence states, "The VMT in the study area estimated for the build alternative is slightly higher than for the no build alternative because the proposed roadway would increase access, attracting trips that would not otherwise occur in the area." Can it be changed to read "…because the proposed roadway would improve travel time, attracting trips…." Noise: The analysis indicated there will be four affected residences but it would not be cost effective to install noise barriers. COMMENT: Did the analysis consider noise coming from the top of the bridges that will be built at Bliss Spillar and will the elevated noise source make a difference in the decision not to include noise abatement? Impacts to the Natural Environment Geology and Soils The second sentence states that "…erosion would be minimized by using proper techniques and best management practices during construction." COMMENT: The project will be constructed with extra attention given to protecting the environment. We suggest stating that BMPs that exceed the industry standard for development will be used. Can standard BMPs be compared against the higher standard BMPs that will be used here or in the main document? Waters of the US and Wetlands COMMENT: Does this section need to be revised to include the proposed rule change currently under review by USEPA and USDOD? Is this issue moot since the DEIS states that no 404 permit will be required? Water Quality The fourth sentence states, "Impacts would be minimized by the use of robust BMPs during roadway construction and operation." COMMENT: We suggest including a side-by-side comparison of the BMPs used for development and the BMPs that will be used for this project? COMMENT: What level of storm event will the project BMPs be designed to capture and treat? The last sentence in the last paragraph lists the regulations that are in place to protect water quality from the effects of induced development. These include TCEQ regulations requiring BMPs and preparation of SW3Ps, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the Clean Water Act. COMMENT: The County is an MS4 operator.	

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		Should its SWMP be included on this list? Hazardous Materials COMMENT: Is it intended to prohibit post-construction truck traffic from using this road? No Build Alternative Impacts to human environment Socioeconomic Resources COMMENT: It appears that there will be no difference in the no-build or build alternatives. Air Quality COMMENT: It appears that there will be no difference in the no-build or build alternatives. Noise COMMENT: No build results in more congestion and neighborhood cut-through traffic which brings more road noise. Waters of the US and Wetlands COMMENT: There are no wetlands on the project so will there be no difference in the build or no-build alternatives Threatened and endangered species COMMENT: It appears that there are no endangered or threatened species or habitat so will there be no difference in the build or no-build alternatives Page ES-9, Air Quality There is no discussion regarding the emission emitted from idling vehicles as it relates to the build alternative. The reduction in delays will reduce the idling vehicles. In turn the emissions from these vehicles will be reduced by reduction in travel times. Page ES-12, Waters of the US & Wetlands Isn't a 404 permit required if any work is performed within the 100 year floodway? Will any of the bridge structure be within the floodway? Even if it is covered by a nationwide permit it should be stated here. Section 3.0 Affected Environment & Environmental Consequences 3.1 Land Use Local Plans and Policies The discussion of City of Austin & Travis Country jurisdiction is not complete or clear. Within the Austin ETJ, the City and County have joint jurisdiction for many projects • Subdivisions are subject to joint City-County review under the Chapter 30 Single Office. • Non-subdivision development is subject to separate development permits by City & County. • In unincorporated areas both the County and the City of Austin have authority as permitted Municipal Separate Storm Sewer Systems (MS4s). Proposed Land Uses This section does not account for joint jurisdiction of City and County for environmental review and development permits. 3.6 Edwards Aquifer/Groundwater Resources The project area is acknowledged to be a highly sensitive environment. The DEIS proposes an Environmental Compliance Management Plan (ECMP) with specific guidelines and an on-site compliance manager. This is appropriate for any large scale or significant project when environmental issues are important. However, the ECMP as presented does not appear adequate to address the heightened environmental concerns of this project or to rise to the level of intensive scrutiny promised by CTRMA and TxDOT. During working group sessions, COA staff described a more intensive approach described as Environmental Commissioning. We urge CTRMA and TxDOT to expand their approach to environmental management to include environmental commissioning. This is especially important to ensure against degradation of Flint Ridge Cave. The EC lead must be empowered to direct, alter or stop work with the primary goal of ensuring protection of FRC. The ECMP as presented is very preliminary and conceptual. Numerous Best Management Practices are referenced but are described in concept rather than in specific detail and linked to specific design features. One way to address this is by strengthening the Environmental Management Plan to encompass the Environmental Commissioning concept. Much of the discussion of BMPs suggests that the BMPs will be used to meet TCEQ standards. We strongly urge the DEIS be revised to emphasize that these standards will be the minimum requirement for performance. This is consistent with the plan stated goal of achieving better than minimum compliance standards. Higher level environmental protection is specified at various times in the DEIS, but should be specifically and consistently addressed where TCEQ standards are referenced. Many of the proposed	

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		protection measures are indefinite and conditional. For example: “phased construction would be considered“ (p. 151). References like these should be made more definite. A number of BMPs are detailed in the appendices even though they have been rejected elsewhere in the DEIS. Please clarify. Project representatives indicated on July 25, 2014, that at least 19 karst features near or within the project right-of-way remain under investigation and delineation. It appears that some locations may affect design of the project in a substantial way, such as Jubilee. Additional efforts are ongoing to ascertain the subsurface drainage area of Flint Ridge Cave. Further assessment of potential impacts, roadway design, alignment alternatives, and appropriate construction/post-construction storm water control measures must be undertaken after the remaining data and information become available, considering the potential impacts of the project on surface and groundwater quality. On page 311 of the DEIS, the placement of water quality ponds as construction phase sediment basins is identified to occur “as soon as practical”. It is strongly recommended that placement of all construction BMPs occur prior to disturbance of every drainage area prior to each particular phase of the project.	

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Renee	Valdez	To whom it may concern: I am in favor of the construction of SH45SW. Yes, I am a Shady Hollow resident, so I will be directly impacted in a positive way, but I am also a former TxDOT Transportation Engineer. Austin is becoming a major city, whether we like it or not, and we have a duty to provide a transportation system that keeps the city functional. Austin needs a complete loop, but for now, let's just work on getting this one piece constructed. I do feel for the Circle C residents that will be impacted due to the light at Slaughter, heading north on Mopac, however. Connecting SH45SW to Mopac will generate much more traffic at that light, so I do hope that a possible overpass will be looked into at that intersection. However, commuters from south Austin and Hays County should be using highways to travel into town, not city streets. Thank you for putting so much time and effort into this project. Sincerely, Renee Valdez	2014-08-13 13:23:58
David	Pimentel	General comments on DEIS of SH 45 SW: 1) Prohibit trucks carrying Hazardous Material (HC) from using this segment of the road. This includes trucks carrying gasoline. 2) Runoff from the bridge over Bear Cr. should be routed by scuppers to water quality protection ponds on either side. The ponds should exceed the normal 25 year design storm and be located high enough to avoid flooding. The creek has exceeded typical flood levels in recent years. 3) The geologic assessment should address caves, sinkholes and other recharge features in the creek that directly effect recharge, esp. the rather large sinkhole in the creek at Marbridge. 4) Projections of traffic diversion are probably overly optimistic. The hypothetical $.30/mi. is too high to attract many multi-car families from using it regularly.	2014-08-13 13:46:34
Chris	Howington	I have been living one block off Brodie for nearly 15 years (close to the Fire Station). I have also been a resident in Austin for over 30 years. During school time, the traffic on Brodie is stop and go heading north, beginning near the Fire Station for ~2 miles until you reach Slaughter. I do not view this as a safety hazard from a school zone perspective since there is a limited actual school zone AND I rarely see children in the area. It adds about 15-20 minutes of drive time from that point to Slaughter. In the evening, through out the year, there is a dangerous pile-up of cars in the Brodie/Slaughter intersection for those heading South on Brodie. Plus the heavy cross-Brodie traffic on Slaughter exacerbates the risks of moving through this intersection. No amount of traffic signal synchronization, speed bumps, or other measures directly related to modifying Brodie will fix the traffic clog. Forget the histrionics about what was promised or committed in the past - the fact of the matter is that there is a viable solution from a routing perspective that now is required. Furthermore, the growth up the corridor of FM1626 into Hays County is only growing further. From an environmental perspective, if due diligence is done to protect the water quality and habitat of the area, it seems that the question is whether it is better to do that or have all those vehicles spending more hours on the road producing more exhaust, or get them onto the appropriate freeway earlier. In any case, the cars will end up on Mopac, whether it is via SW45 or other roads (Slaughter or Davis). Anyone living in this area that is affected by this situation knows this road needs to be built.	2014-08-13 14:05:17
Chuck	Lesniak	Per instructions from Stacey Benningfield, TXDOT, due to the large number of comments on the DEIS the City of Austin is to submit comments electronically via e-mail directly to Ms. Benningfield.	2014-08-13 14:40:36

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Heather	Withrow	I live along SH45 and Escarpment. I don't like SH45SW, I am against it, but since it's probably going to be built anyway, please please consider it a High Occupancy Vehicle (HOV) highway for 2+ or 3+ passenger vehicles, that way we can reduce the number of vehicles on the proposed stretch of SH45SW and Mopac. Toll roads are for the people who have disposable income. I am very concerned about the high driving speed- 70 m.p.h. especially when we have local streets coming out to the existing 45. If SH45SW actually is built, it brings more speeders to our stretch of 45. The proposed Mopac Underpasses at Slaughter and LaCrosse MUST be built before the completion of the proposed SH45SW. Sincerely, Heather L. Withrow Overtaxed SW Austin Resident	2014-08-13 15:43:58
Amber	Cole	Build SH45SW already! SW Austin desperately needs relief from the traffic from the south pouring through our streets (Manchaca, Brodie, Slaughter, etc.) and neighborhoods, to get to MOPAC/Austin. NO Speed Bumps on Brodie!! That would just slow traffic even more for those of us who live off Brodie. It would cause more congestion in the area. Why didn't the bond that was past YEARS ago to build 45 from Buda to MOPAC never happen and on top of that we are still having to vote wether we want it or not. WE WANT IT!!!	2014-08-13 16:52:01
Amy	Rupp	TX SH 45 SW should not be built until there are improvements to north-bound flow on I-35 or Mopac. Otherwise, the traffic it brings to south and southwest Travis county will bypass Mopac and continue west on the existing section of TX SH 45, which is already itself a dangerous road with many wrong-way drivers and racing. All alternative northbound roads, such as Escarpment and FM 1826, will receive a substantial increase in traffic with consequent degradation of the neighborhoods they serve. A toll road built to help one neighborhood's traffic problems (Shady Hollow) will instead impact many others. Secondly, Texas SH 45 SW should not be built until Hays County, whose residents are the primary beneficiaries of this road, has several communities that are tax-paying members of Capital Metro. Williamson county communities are already members; if Hays County residents want access to Austin, then they should pay into Capital Metro as do the communities in Travis And Williamson counties. Third, SH 45 SW is a road of last resort to be built in an environmentally sensitive area, when the obvious choice for Hays County residents to use into Austin is IH-35. Failure to enact significant relief on IH-35 is a continuing failure of leadership across the entire greater Austin metropolitan area. SH 130 has been a failure; why will SH 45 SW succeed when there is no projected relief for northbound Mopac/Loop 1 until next century? Regards, Amy Rupp.	2014-08-13 17:04:48

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Stephen	Beers	COMMENTS ON SH 45 SOUTHWEST DRAFT STATE ENVIRONMENTAL IMPACT STUDY Stephen K. Beers President, Save Barton Creek Association (SBCA) July 29, 2014 Claims have been advanced that the proposed SH 45 SW project is “environmentally friendly,” “most and best environmental protection”(Aleshire); ”just as good a project [without the federal environmental process”(Daugherty); “going above and beyond [the letter of the law]” (Swonke); and reducing “pollution to below naturally occurring levels.” (Swonke) These claims are provably false for three reasons. First, the State EIS is being undertaken specifically to avoid Federal scrutiny under the National Environmental Policy Act (NEPA). So, with respect to passing an objective review, this is plainly not the most stringent standard available. TxDOT is grading its own homework, rather than letting the Federal Highway Administration screen and pass judgment. If the DOT and the RMA are confident that the project has negligible impacts and is indeed 'state of the art, then why not submit this EIS document to federal agencies for approval? Second, the project does not come up to certain standards already established in other States. Discharges from large construction sites are typically measured in thousands of turbidity units, with up to 16,000 NTU (nephelometric turbidity units) observed on some roadway projects. The US EPA had proposed a low numerical limit of 280 NTU in December 2009 to control this impact nationwide, a drastic improvement over typical discharges, but the draft rule was later withdrawn. In preparation for the change, TxDOT commissioned a study published in May 2014, referenced at the end of this statement, on the enhanced treatment of construction runoff. The study surveyed all fifty states' rules on construction runoff. Washington state already required that “Turbidity shall not exceed 5 NTU over background turbidity when background turbidity is 50 NTU or less, or has more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.” Their 2010 Construction General Permit also adopted EPA's 280 NTU limit for sites with 10 or more acres of disturbed land. To achieve this very high standard, Washington and other states inject coagulants into the stormwater which can produce a very clear stream prior to discharge. Such coagulant treatment was the main technical subject of the referenced study done by the Texas Transportation Institute (TTI) in preparation for the EPA rule and sponsored by TxDOT. Washington's major motivation for adopting their very strict standard was protection of endangered salmon. Central Texas is home to endangered aquatic species and a highly sensitive water resource, the Edwards Aquifer. Should Texas do any worse with its construction practices than Washington state does? Third, the TxDOT plan does not measure up to the highest available local standard either. The SOS ordinance requires no increase in average annual background loading for 13 pollutants. By contrast, TxDOT	2014-08-13 17:09:19

First Name	Last Name	Message	Date Created
		collapses all consideration of pollution down to a single metric, Total Suspended Solids (TSS). The SOS ordinance also restricts impervious cover on the Edwards Aquifer recharge zone to 15 percent. SH 45 SW doesn't follow this standard, with a reported 24.2% impervious cover. TxDOT proposes no offsite mitigation lands to compensate, as other projects do. A legend has been created that best management practices proposed are greater than normal for this project. It was stated in our local press that there's been progress in Texas stormwater practices. In fact, TxDOT could have supplied much the same text and information twenty years ago, and did. Appendix H does survey additional methods not currently used on Texas roadway projects—but then rejects each of them! No constructed wetlands, raingarden bioretention, retention/irrigation, nor alum (coagulant) injection treatments are deemed feasible. Let's translate the control methods proposed by TxDOT from jargon into everyday talk: grassy swale (roadside ditch); vegetated filter strip (grass /dirt); detention pond (hole in the ground). These crude techniques have been around, failing, for decades. Tim Jones, former City of Austin environmental board member, has shot what seems like miles of videotape documenting failure of the TxDOT structural controls on Mopac during storms. The 90 plus percent removal rates claimed for TSS are unrealistic in practice. Spectacular pollution incidents only recently occurred near Austin at Lick Creek, Hamilton Creek, Hamilton pool, Dead Man's Hole, and Williamson Creek. Actual performance does not match the idealized conditions described in professional literature for these control methods. So-called catastrophic failures are evidently not rare. Other methods noted in the EIS are berms, filling in karst features (paving over them?) ; "Road designers could use mulch logs, rock filter dams, silt fences and water quality ponds to reduce pollution." Yes, they “could.” But not effectively. And no guarantees or performance bonding are being offered for this project. The slipperiness in phrasing for the TSS standard belies the extravagant claims made. The promise of a 90 percent reduction is based on what numerical starting point? If someone proposes to reduce their speeding ninety percent of the time, is that as definite and binding as a speed limit of 65 mph? Should we really be impressed by a pledge of a percentage reduction, or instead seek specific pollutant concentration and load limits that would follow the best available existing standards? Finally, the usual control methods are risky in this location, and inappropriate for a karst aquifer. Recharge through soil into groundwater occurs everywhere in this zone. The underlying limestone rock in the project area has numerous cracks, fissures, caves, sinks, voids, and holes. Methods like swales, filter strips, and the like typically infiltrate water into the ground, thereby keeping it out of surface streams. But here on the karst recharge zone, such infiltration methods inject pollutants directly into the aquifer, with little to no attenuation. A technical innovation TxDOT does embrace, pervious friction course pavement (PFC), lets water infiltrate down through a permeable roadway surface. However, if there is not an impermeable “catchpan” underneath to intercept this stormwater, and then treat it effectively	

First Name	Last Name	Message	Date Created
		somehow, then this BMP really is not appropriate for the aquifer recharge zone. If there is any more to this technology, it seems to lack a sufficient explanation in the text for a reader to adequately understand how it is supposed to remove or treat contaminants. If I have somehow overlooked such an explanation, my apologies. The TxDOT discussion of alternatives to 45 is likewise deficient. Both "Build" and "No-Build" alternatives assume that all other roadway and transit additions in the CAMPO 2035 plan occur before 45 is finished. With this assumption of otherwise identical facilities, OF COURSE the traffic situation would improve more if SH 45 were built than if it is not. But if the $100 million earmarked for SH 45 is fungible and freely available to spend on any other project in the CAMPO plan, then where is the analysis of which projects supply the most relief for average travel time and congestion? TxDOT irrationally assumes that all roads other than SH 45 SW get built any way prior to 45 being completed—regardless of whether there is any money available to pay for them after this $100 million gets spent. This biased comparison simply sidesteps the fact that TxDOT proposes to spend $80 million in State gas tax dollars, and $15 million in Travis County and $5 million in Hays County property tax dollars to build a road that then only certain toll-paying motorists will be able to use. A different, nontolled road in another location would inevitably draw more traffic for the same money. With fair judgment, even proponents of SH 45 would admit that if all roads in the CAMPO plan are required eventually, then it still makes the most sense to build those roads first that give the most traffic relief for the money. Until one examines the basic question of what's the best way to spend $100 million, then you are very likely leading off with the very weakest and least justifiable project. Lending strength to that contention is the high price tag to build this boondoggle -- nearly $30 million a mile. Compare this to actual recent costs (2013) incurred on new road construction projects in Florida: a 4 lane rural arterial, $5 million a mile; 4 lane rural interstate--$5.8 million/mile; diamond interchange on that same rural interstate $19.678 million; an urban 4 lane arterial with 5-foot sidewalk, curb and gutter with divided median – $6.7 million per mile. This excessive pricetag for SH 45 SW even compares unfavorably to TxDOT's recent construction of SH 71 at Riverside—a much wider highway consisting of six mainlanes and six frontage road lanes, with deep ground excavation and bridges, coming in at $23 million a mile. Let's say that all the projects in the CAMPO plan will get built, simultaneously, so that there is no monetary tradeoff necessary between projects. Everything can get built without taking money away from any other project. This is totally unrealistic, but let's grant the assumption. Is there still an additional opportunity cost that is not adequately documented in this EIS report? Spending $100 million on a project without federal environmental clearance means that money can't be spent on other projects that can receive federal matching funds. Federal aid projects can receive up to an 80 percent reimbursement from FHWA. So, we would be foregoing up to $500 million in funds we could use on other projects ($100 million state/local + $400 million federal). Some will say the federal money is flowing slower these days, that we need to hurry up and build SH 45, no matter what. This is the cry we hear from certain impatient pleaders. However, it makes no financial sense to pursue projects that can't get federal money, ahead of those that can. We can always build a road first with state or local money, and then get reimbursed later by the feds. A slow federal pay is not a reason to skip getting federal approval altogether. Reimbursement is the normal procedure. What projects we spend our money on today will determine what federal funds we can receive and spend in the future. By spending $100 million on 45, we throw away up to $400 million in matching federal	

First Name	Last Name	Message	Date Created
		money. Pursuing federal environmental clearance makes sense. It is not just senseless red tape. Applying the NEPA law as intended it is a way to screen projects and compare them objectively precisely in order to save money, human health, and natural resources. Moreover, there is an additional, powerful financial incentive to do this federal review correctly, so that our region can then receive its proper share of federal monies—funds which will otherwise go elsewhere in Texas. Finally, SBCA would like to address the public hearing that took oral testimony on the project. TxDoT and CTRMA should be commended for having this event at a location convenient for people who live near where the road is proposed to be built. The effort you've made to receive that public input is appreciated. However, the issues surrounding SH 45 SW extend to more than a simple road project. Any alignment in the recharge zone of the Barton Springs Edwards Aquifer inherently includes the ability to negatively affect this regional water resource. This potential impact would affect a far greater area than the project area as defined in the Draft Environmental Impact Statement. We respectfully request that you schedule a public hearing to be held at Barton Springs. This is a location that considers and accommodates the convenience of other stakeholder testimony, at a site where the imperative of continuing viability and protection of Edwards Aquifer water quality is evident. Thank you again, for your outreach to the public through this process. REFERENCES Washington State Department of Ecology. 2010. National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity. http://www.ecy.wa.gov/programs/wq/stormwater/construction/permitdocs/cswgppermit120110.pdf Performance Testing of Coagulants to Reduce Stormwater Runoff Turbidity, Texas A&M TTI. http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/0-6638-1.pdf Carlos Swonke, director of TxDOT's Environmental Affairs Division (quoted in Impact News, June & July 2014): Florida DOT 2013 Road Costs.pdf, accessed on worldwide web.	
Tom	Warmbrodt	Please leave 45SW alone. The burgeoning communities there should grow in an organic and healthy manner. They shouldn't be subjected to the external pressures of huge increases in poorly-planned intercity traffic.	2014-08-13 17:30:47
Gay	Mixon	As a Hays County resident, I want to voice my opinion to build SH45SW NOW. Hays County has a large growing population many of whom work in Travis County. We need alternate routes to get these people back and forth to their Travis County jobs in a reasonable manner.	2014-08-13 17:33:03

First Name	Last Name	Message	Date Created
Greg	Charles	I have been a resident of Shady Hollow for 26 years, and I have seen the problem of getting on Brodie Ln from Sesbania for quite a long time. I have no issue with building SH 45SW in the macro scheme of things. What bothers me is the politics of the project. The political message, implied or conveyed, has been that traffic on Brodie between FM 1626 and Slaughter Ln will go away if SH 45SW is built. The impression given is that the traffic is coming on Brodie Ln from FM 1626, because of development in northern Hays County. As I mention above, I have been a resident for 26 years, and I witnessed the traffic build up as development increased in Shady Hollow, and parents from Circle C, Oak Parke, as well as Shady Hollow, shuttled their students back and forth before and after school to Bailey MS, Baranoff Elem., and Bowie HS.The more houses in Shady Hollow, the more traffic with no alternate route. The other traffic issue is Bowie HS parents and students trying to turn left from Brodie to go through Oak Parke in the morning. Please let the residence know what impact, if any, SH 45SW will have on the congestion on Brodie, given that SH 45SW will be a toll road. As I see it, the lack of an alternate entry and exit from Shady Hollow, and the schools location, are the main reasons for the lack of free flow of traffic on Brodie Ln into and out of Shady Hollow. I do not see people paying tolls to get off Brodie Ln. Thank you.	2014-08-13 17:56:15
M	Morgan	Building 45 will cause more problems than it will hope to fix per the current plan. Judicious city planning on the part of Austin and surrounding cities is necessary.	2014-08-13 18:17:27
Anna Maria	Echols	This road is 25yrs overdue. The majority of this traffic is coming fm Hays Co, and they need access to Mopac. We the people who live in the Shady Hollow area know this and have verbalized this on numerous occasions. It seems always to fall on deaf ears. Putting speed bumps on Brodie Lane is not a solution; the roadway fm 1626 to Mopac is. PLEASE BUILD THE ROADWAY	2014-08-13 18:57:48
Alice	Werchan	Please build SH45 SW ASAP. Traffic on Brodie Lane is awful, unsafe for neighborhood travelers, children getting to school, parents trying to get to work and school, etc. We voted to build the road over 15 years ago. Let's not talk about it any more. Speed bumps will not help lower the number of cars on Brodie Lane. It's not a factor of speed. It's a factor of heavy traffic trying to get somewhere. Someone is going to get hurt. Please build this road. Just a road. No gas stations, no McDonald's or HEB. Subdivisions are out there....just build a road so people don't have to drive on Brodie. It's a neighborhood street and was not intended to be a major roadway. It's not a MOPAC or Lamar Blvd. Please help build it.	2014-08-13 20:24:02
Betina	Luker-foreman	Please build SH-45 now. The numbers don't lie, our area has grown exponentially in the last 20 years. We have seen 300% growth in the far south Austin area in the last 15 years. People are still coming and builders are still building. The demographic experts say this area will almost double in population between now and 2035. We can't wait for the roads, our quality of life is already affected negatively. We needed the road 20 years ago, now we are desperate. Please listen to the area residents. The SOS people in north Austin are not affected by SH-45, they have adequate roads, we don't. Please finish this 20 year old project. Also Brigid Shae clearly does not grasp the problem when she suggested road bumps to slow down the cars. The problem is not speed, it is the high volume of cars using a small neighborhood street with zero environmental protection. The cars coming off 1626 need to access MOPAC directly. Those drivers have no business on a neighborhood street. There are more cars driving on Brodie Lane (20,000+ every day) than there are on the 130 Toll road (5,000 a day)	2014-08-13 20:36:15

First Name	Last Name	Message	Date Created
Betina	Luker-foreman	Please build SH-45 now. The numbers don't lie, our area has grown exponentially in the last 20 years. We have seen 300% growth in the far south Austin area in the last 15 years. People are still coming and builders are still building. The demographic experts say this area will almost double in population between now and 2035. We can't wait for the roads, our quality of life is already affected negatively. We needed the road 20 years ago, now we are desperate. Please listen to the area residents. The SOS people in north Austin are not affected by SH-45, they have adequate roads, we don't. Please finish this 20 year old project. Also Brigid Shae clearly does not grasp the problem when she suggested road bumps to slow down the cars on Brodie Lane. The problem is not speed, it is the high volume of cars using a small neighborhood street with zero environmental protection. The cars coming off 1626 need to access MOPAC directly NOT via Brodie Lane. Those drivers have no business on a neighborhood street. Many Austin residents don't realize that a large part of Austin is actually in Hays county. Austin extends out 290 to RR 12 and Fitzhugh road, so those people pay Austin taxes and deserve to be able to get downtown too. There are more cars driving on Brodie Lane (20,000+ every day) than there are on the 130 Toll road (5,000 a day)	2014-08-13 20:41:23
Betina	Luker-foreman	Please build SH-45 now. The numbers don't lie, our area has grown exponentially in the last 20 years. We have seen 300% growth in the far south Austin area in the last 15 years. People are still coming and builders are still building. The demographic experts say this area will almost double in population between now and 2035. We can't wait for the roads, our quality of life is already affected negatively. We needed the road 20 years ago, now we are desperate. Please listen to the area residents. The SOS people in north Austin are not affected by SH-45, they have adequate roads, we don't. Please finish this 20 year old project. Also Brigid Shae clearly does not grasp the problem when she suggested road bumps to slow down the cars. The problem is not speed, it is the high volume of cars using a small neighborhood street with zero environmental protection. The cars coming off 1626 need to access MOPAC directly. Those drivers have no business on a neighborhood street. There are more cars driving on Brodie Lane (20,000+ every day) than there are on the 130 Toll road (5,000 a day)	2014-08-13 20:41:52
Brian	Dudley	Dear TxDOT and CTRMA officials: The EIS and proposed extension appears to suffer from limitations seen in the original Loop 1 Impact Study done in the late 1970's, where removal of Federal funding allowed an insufficient and limited impact study. The SH45 SW project will overload the already maxed out corridor capacity of Loop 1 and provide a bypass to I35. The Loop 1 corridor is growing and will need additional capacity for demand in that corridor and to the SW. Serving the SE and interregional I35 travel with this facility produces a wide range of negative impacts. This road will also put over-development pressure on Edwards recharge areas that our community has put resources into for the purpose of water quality and sensitive area protection. Undesirable travel and development patterns will occur with this project. Additional alternative evaluation should be done on options to serve local rather than interregional travel patterns in the Brodie/FM1626 sector of the Austin Area. This EIS is structured and being used as a political tool to promote development in a sensitive environmental area. It should be done correctly and completely according to Federal EIS guidelines. Thank you.	2014-08-13 22:05:10

First Name	Last Name	Message	Date Created
Kindal	Baker	It is irresponsible of TxDOT to forge ahead with construction of any one of the four or the whole project of 45SW and without sound scientific and factual evidence based draft EIS. The draft EIS fails to analyze the whole actual project; building the 45SW at the same time proposing to build freeway main lanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections and to expand South Mopac from Slaughter Lane all the way up and across Lady Bird Lake to Cesar Chavez with up to three additional lanes in each direction. 1) IMPACT ON LOCAL AREA: Expanding and tolling the Mopac/45SW loop will essentially convert it from a local commuter highway into an interregional and interstate freeway system. This project is over many miles and impacts a great area of South Austin. This study needs to be the reviewed as a whole project instead of four sections too fully understand and provide competent and comprehensive analysis results focusing on whether Mopac should keep for local commuters or convert it into I35. 2) GAPS IN DATA AND LACKING VALIDITY: As the draft admits, critical studies on caves, sinkholes, and other aquifer recharge features in the right of way are not completed. The actual alignment and controls for managing storm runoff pollution during construction and post construction have yet to be designed. The DEIS admits that a “cumulative impacts” study and study of historic and archeological sites along the planned route have yet to be completed. As a result, the DEIS fails to actually “analyze” the impacts and evaluate the alternatives, because the necessary studies have not been completed. This is NEGLIGENT of TxDOT. TxDOT needs to withdraw the DEIS and republish when the required studies are completed. Otherwise, the EIS and public comment process is a charade and violates TxDOT rules. 3) POLLUTION IMPACT: The draft EIS ignores noise, air, light and visual pollution effects on Mopac corridor neighborhoods, public lands, and the Lady Bird Johnson Wildflower Center. By pretending the project stops at the southern tip of Mopac and at FM 1626, the draft EIS ignores the noise, air, light, and visual pollution that will result from the 15,000 to 40,000 more cars and trucks on south Mopac and the necessary expansion and construction on Mopac from 45SW all the way north to Cesar Chavez. The DEIS fails to examine the noise and visual intrusion on Wildflower Center gardens from the increased car and truck traffic and the construction of elevated connector bridges at the 45SW/Mopac, Lacrosse/Mopac, and Slaughter/Mopac intersections. Elevations of these connecting bridges and the lights for them are not disclosed, so it is impossible for either TxDOT analysis or independent analysis. The 45SW route and Mopac to the north passes through watershed preserve lands and parks which will be harmed by the construction of a major toll road across Texas’ most vulnerable drinking water aquifer. TxDOT should study the harm to Mopac corridor neighbors, (like my family) the Wildflower Center, (which counts on these as part of the essence of the park and as our previous first Lady had intended) and public parks and preserves resulting from air, noise, light, and visual pollution from the proposed 45SW toll road and Mopac expansion. 4) ALTERNATIVES: EIS fails to consider quality, affordable and sustainable alternatives. TxDOT’s analysis shows that building 45SW increases Mopac congestion. There are higher quality alternative to improve north-south commuting between Hays County and Austin including, a) upgrades to I-35, Manchaca, and Brodie; b) new bus service that currently does not exist; c) and subsidizing of telecommuting, carpooling, ridesharing, and other steps that reduce single-occupancy commuting. Spending $100 million to divert more traffic to Mopac demonstrates TxDOT ‘s poor judgment and lack of ability to meet a complex challenge. TxDOT to invest in these “shared solutions” that are more effective and do not pave over	2014-08-13 22:12:34

First Name	Last Name	Message	Date Created
		the Barton Springs Edwards Aquifer recharge zone. Finally, it is very telling when the City, for which you are creating the road, requests you to use better judgment.	

First Name	Last Name	Message	Date Created
Alice	Eichelmann	I have lived in this area since 1984. When I moved off of Brodie Lane in 1995 I was pregnant with my second child. At that time Brodie Lane did not connect with 1626 and of course it was easy to traverse up and down Brodie. Over the next several years after Brodie was opened at 1626 we noticed the traffic becoming unbearable. I now have three children and two are in college. My youngest is starting high school in a few weeks. I always thought that SH45 would be built to alleviate the traffic on our street before my children started driving. Needless to say that did not happen. It is very dangerous to take a left out of our street. It is hard to find a break in the traffic on both sides of the road. If you want to get on the road you have to just gun it and go. Many times I have experienced road rage from other drivers that are mad that I had to take a left and get in front of them. I'm not really sure why that upsets people when they are crawling along at only a few MPH. I believe it is because they are not aware that people on the side streets need to use Brodie and they are taken by surprise when I suddenly appear in front of them. I have told my children to take a right to go left. This maneuver requires driving to a street on the opposite side of Brodie and pulling into a resident's driveway and then backing out and finally getting to go in the right direction which is usually Mopac via Slaughter or Davis. MoPac is a Hwy and is not a local road. It was not built to be the private Hwy for Circle C and the other neighborhoods that have sprung up along Mopac South in the last few years. I have heard over and over that opening Mopac will add an additonal 25,000 cars to an already congested MoPac. Those cars are already getting on Mopac via Brodie or Manchaca and then Slaughter or Davis to Mopac. I love Barton Springs and used to ride my bike almost daily during the summer when I lived off of Oltorf as I was growing up. I still swim at Barton and I am confident that this road will help alleviate pollutants that are draining into the aquifers. There are no protections on Brodie Lane and we have many karsts along Brodie . The idling cars and the spills they create are draining into the aquifer. SH45 may actually help improve the water quality. Let's get the road built! Thanks so much for reading this.	2014-08-13 22:23:54

First Name	Last Name	Message	Date Created
JH	Gillespie	I have been trying to send this to your Fax number, which keeps rejecting the fax. In addition you have no listed email address where attachements can be sent. Therefore, I am copying the text of a report that I am attempting to send via fax. Please send me a valid email address where I may attache the original PDF document. ***** Proposed State Highway 45 Draft EIS Review Impacts on Endangered Species Barton Springs Salamander, photo © JH Gillespie Submitted to: Save Our Springs Alliance by J.H. Gillespie, Ph.D. ecologist / endangered species specialist jhgillespie.wordpress.com Austin, TX (512) 522-8278 August 2014 Introduction & Summary The proposed State Highway 45 project over the environmentally sensitive Barton Springs segment of the recharge zone of the Edwards Aquifer has the potential to significantly impact at least three endangered species, as well as cave-dwelling fauna in Flint Ridge Cave. These species include the endangered Barton Springs Salamander (Eurycea sosorum), the endangered Austin Blind Salamander (Eurycea waterlooensis), and the endangered Golden Cheeked Warbler (Dendroica chrysoparia). Activities during the construction phase and operation of this the proposed SH45 project present both acute and persistent threats to these species that are not adequately accounted for the TXDOT Draft Environmental Impact Statement (hereafter referred to as the draft EIS). Ross (2014) presents numerous examples of the inadequacies of the draft EIS with respect to water quality and quantity – which will not be repeated here – suffice to say that the author concurs with arguments evidence presented in that report. Specifically, the draft EIS: • Fails to present or propose specific water quality goals or monitoring procedures. • Inappropriately designates Total Suspended Solids as the sole water quality parameter to mitigate while ignoring many other pollutants that may be transmitted to the aquifer by a highway project of this magnitude including but not limited to: fuel, PCBs, nutrients from organic sediment containment BMPs, pesticides and herbicides, etc. • Contains weak and non-committal language about BMPs and mitigation efforts, suggesting such efforts might occur. Furthermore, the draft EIS, not provide details of specific types of BMPs to be used or maintenance schedules, which are critical for their successful operation. With respect to considerations for endangered wildlife and habitat destruction, the draft EIS: • Severely understates the indirect impacts of the proposed project not only in the SH45 Study Area but in endangered species habitat downstream and in the Edwards Aquifer which are integrally connected via surface and groundwater pathways. • Operates on the unrealistic and irrelevant expectation that wildlife must be found immediately within the state-owned right-of-way to be affected by proposed construction and operational activities. Furthermore, the draft EIS makes the erroneous implication that that sightings should be made in 2014 site visits to be relevant. • Uses inadequate survey effort to assess habitat quality and presence/absence of endangered species and species of concern in the SH45 Study Area. • Ignores significant research regarding the effects of increased impervious cover, waterborne contaminants associated with development, construction	2014-08-13 22:35:21

First Name	Last Name	Message	Date Created
		impacts and construction activities on endangered salamanders and their critical habitat. Inadequate Survey Effort & Understatement of Indirect Effects The major failure with respect to wildlife impacts is that the draft EIS focuses almost entirely on whether endangered species or species of concern have been found (in 2014) immediately within the boundaries of the state-owned ROW. It fails to account for many direct and indirect effects on wildlife that will occur immediately adjacent to, nearby, downstream from or within the recharge zone of the proposed highway construction and operation. It is both unrealistic and inadequate for the standard of whether or not there will be wildlife impacts or take of endangered species to be dependent solely on whether or not the species have been sighted on the state-owned ROW itself. While there is a cursory discussion of 'edge effects' and indirect effects in Chapters 3 and to a much lesser extent chapter 6, there is a large body of research on the wildlife impacts of highway construction projects that are entirely absent from the draft EIS. Furthermore, the draft EIS provides inadequate field surveys effort to conclude that there will be little long-lasting impact on wildlife (as claimed in Chapters 3 and 6). It is never appropriate to conclude presence or absence of species based on single or a handful of field observations -- especially when those observations are made during times of the year during which you would not expect the target species to be active. When studying rare and endangered species, presence/absence may need to be determined by regular field visits during different environmental conditions. The draft EIS does not provide details of field survey effort, field notes or qualifications of those conducting the field surveys for wildlife. Numerous references to "desktop" and "windshield" surveys of vegetation and wildlife observations are made in the draft EIS document. The document references two site visits that took place in August 2013 and December 2013 but provides no details of these site visits or survey protocol(s) if any were used. The draft EIS states that there were few migratory birds found during these months, which is not surprising given that these are not months of the year in which you would expect north American migrant activity. In fact, they are the two months of the year in which one would expect to find the least animal activity due to climatic extremes often encountered in August and December. Furthermore, in reference to potential endangered horned lizard habitat, the draft EIS indicates that while suitable habitat is present in the SH45 study area, neither the lizards nor their prey (seed harvesting ants) were found in a single December 2013 site visit. Survey protocol for these species is not provided and given that both lizards and ants are exothermic, it is not reasonable to expect that that either should be particularly active during the coldest months of the year. Texas Natural Diversity Database query information is used in the EIS to determine which species of concern and endangered/threatened species may be present in the SH45 study area. However, this database does not contain all known records of occurrence. In addition, the TXNDD query site specifically states that, "Receiving data from the TXNDD does not constitute a project review. A project review entails TPWD's Wildlife	

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		Habitat Assessment (WHAB) Program reviewing environmental documentation for specific projects". Records from this database alone are insufficient to make claims about whether wildlife will be disturbed by the proposed SH45 project. The draft EIS also concludes that because Bear Creek was dry during some site visits and wet during others that the SH45 study site does not contain potential habitat for many aquatic species listed in Table 3.8-3. This is inappropriate to assume, as several of those species could be presumed to use Bear Creek as habitat when it is wet. Golden-Cheeked Warblers In a report dated July 2014 by Baer Environmental Consulting for the Water and Wastewater Utility Wildland Conservation Division summarizes endangered Golden-Cheeked Warbler sightings near the Travis/Hays county line and very near the proposed SH45 study area from 2000-2013. There have been 153 sightings of the endangered species in that time, including sightings and territory mapping along Bear Creek on City of Austin Water Quality Protection Lands. Though survey effort was insufficient to detect this species in spring 2014, site visits by the author along Bear Creek in the vicinity of the proposed SH45 ROW indicate a healthy, diverse native juniper-oak woodland with very few introduced or invasive plant species: in-tact and healthy GCWA habitat. As the proposed SH45 ROW will directly cross Bear Creek on WQPL in the vicinity of these endangered bird territories, the project threatens to bisect two large habitat patches which may be not only essential territories for spring breeding, but may also be important migration corridors through which birds reach surrounding habitat in the Balcones Canyonlands Preserve system. The SH45 draft EIS cites a report by SWCA dated late May 2014 as reporting no sightings on the state-owned ROW in 2014. Since that report was completed and provided to TXDOT before the end of the GCWA birding season, and since the draft EIS lacks any details of the report or survey protocols (dates, number of site visits, hours of survey effort, time-of-day, transect locations), it is premature to conclude that GCWA are not present from the study area or in the state-owned ROW. Such a determination requires multi-year survey effort with field visits across the breeding season. It is common in studies of endangered species to have to conduct regularly timed surveys throughout the active period of the year (Feb – June for GCWA), sometimes for multiple years to detect the presence of a rare animal. In short, the fact that SWCA did not find birds in spring 2014 in the study area is not sufficient evidence to conclude the birds are absent and is not sufficient evidence to conclude that the proposed SH45 project will have no impact on this species. Site visits by the author to private property along Bear Creek (accessed with permission April 11, 2014) and to the City of Austin's WQPL (accessed with permission June 16, 2014), both along Bliss Spillar Rd. adjacent to Bear Creek and immediately adjacent to the SH45 Study Area indicated healthy juniper-oak woodland habitat suitable for dispersal corridor and territory establishment for GCWA. More survey effort is needed to determine whether the birds use the SH45 Study area specifically (since, as mentioned above, established territories have been mapped in multiple years at very nearby field sites) uses this area for breeding habitat. Whether or not it does, however, does not negate the utility of this area as a dispersal corridor by which the birds may access other preserve lands to reach their annual breeding sites. Impacts to Salamanders: Impervious Cover As detailed stated by Ross (2014, pg 43) EIS does not account for reduction in water quantity due to increased impervious cover over the EARZ. These are the major threats to both endangered salamander species as well as other obligate freshwater spring species in the Edwards Aquifer that would be affected by the proposed SH45. Effects of impervious cover on water quality and quantity as they	

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		would affect the endangered Barton Springs Salamander and Austin Blind Salamander are reviewed in USFWS (2013, pg. ; for references in quoted passages please refer to original document): "Bowles et al. (2006, pp. 113, 117–118) examined watershed impervious cover effects on salamanders in central Texas, and found significant reductions in salamander density in watersheds with over 10 percent impervious cover. Coles et al. (2012, pp. 4–5), found a loss of sensitive species due to urbanization and that there was no evidence of a resistance threshold to invertebrates that the salamanders preyed upon. A vast amount of literature indicates that 1 to 2 percent impervious cover can cause aquatic habitat degradation. Bendik (2011a,pp. 5, 12–24, 26, 27) reported statistically significant declines in Jollyville Plateau salamander counts over a 13-year period (1996–2010) at six monitored sites with high impervious cover (18 to 46 percent) compared to two sites with lower (less than 1 percent) impervious cover. These results are consistent with Bowles et al. (2006, p. 111), who found lower densities of Jollyville Plateau salamanders at urbanized sites." Impacts to Salamanders: Construction The literature on impacts of construction and development on the two salamander species were reviewed as recently as August 2013 for the USFWS Final Rule to list the Austin Blind Salamander as an Endangered species. All USFWS documents cited herein are available for download at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D033 - status. In that ruling, the USFWS concludes that the best available science indicates that: USFWS 2012 (proposed rule, pge 50773, available at http://www.gpo.gov/fdsys/pkg/FR-2012-08-22/pdf/2012-19659.pdf): "Water quality degradation in salamander habitat has been cited as the top concern in several studies (Chippindale et al. 2000, pp. 36, 40, 43; Bowles et al. 2006, pp. 118–119; O'Donnell et al. 2006, pp. 45–50), because these salamanders spend their entire life cycle in water. All of the species have evolved under natural aquifer conditions both underground and as the water discharges from natural spring outlets. Deviations from that high water quality have detrimental effects on salamander ecology, because the aquatic habitat can be rendered unsuitable for salamanders by changes in water chemistry, quantity, and flow patterns. Substrate modification is also a major concern for the salamander species (COA 2001, pp. 101, 126; Geismar 2005, p. 2; O'Donnell et al. 2006, p. 34). Unobstructed interstitial space (the space between the rocks) is critical to habitat of all four salamander species, because it provides cover from predators and habitat for macroinvertebrate prey items. When the interstitial spaces become compacted or filled with fine sediment, the amount of available foraging habitat and protective cover for salamanders is reduced (Welsh and Ollivier 1998, p. 1,128)." USFWS (2012, pg 50744) outlines the serious impacts of development within the watersheds of the two salamander species. USFWS also presents a detailed analysis of the impervious cover in the watersheds of four central Texas Eurycea species, which is not referenced at all in the draft EIS. Impacts to Salamanders: Water Contaminants The Draft EIS underestimates the threat to the aquifer and dependent species by toxic spills on roadways. National Response Center's database of incidents of chemical and hazardous materials spills from anthropogenic activities including (but not limited to) automobile or freight traffic accidents, pipelines, intentional dumping, storage tanks and industrial facilities and are likely to be underestimates of the total number of incidents because not all incidents are discovered or reported. The primary function of the NRC (http://www.nrc.uscg.mil/foia.html) – a joint program of the Department of Homeland Security and the United States Coast Guard – is to serve as the sole national point of contact for	

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		reporting all oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories. A search of the National Response Center database (accessed 19 October 2012; http://www.nrc.uscg.mil/pls/apex/f?p=109:1:908734227403201) on chemical and hazardous materials spills for Travis County revealed 450 reported incidents involving 146 chemical substances from 1990-2012 (on average 20 incidents per year). Results are displayed in Table 1 below. 147 (32.6%) of these spills directly affected a body of water, the most commonly contaminated medium. Spills that did not directly affect aquatic environments may indirectly do so by contaminating soils or lands that drain to water bodies. The draft EIS does not adequately address how it will contain and mitigate toxic spills of these substances, and the suggested BMPs for Total Suspended Solids are not adequate for containing or removing chemical spills (as discussed extensively in Ross 2014). In its proposed rule to list the Austin Blind Salamander as an endangered species, the USFWS (2012, pgs 50778-20779) provides a detailed literature review of the effects of Contaminants in Stormawater Runoff on salamanders and their prey (see literature cited of the proposed rule for references in quoted passages). USFWS (2012, pg 50778): "Both nationally and locally, consistent relationships between impervious cover and water quality degradation through contaminant loading have been documented. In a study of contaminant loads from various land use areas in Austin, stormwater runoff loads were found to increase with increasing impervious cover (COA 1990, pp. 12–14). This study also found that contaminant loading rates of the more urbanized watersheds were higher than those of the small suburban watersheds. Soeur et al. (1995, p. 565) determined that stormwater contaminant loading positively correlated with development intensity in Austin. In a study of 38 small watersheds in the Austin area, 7 different contaminants were found to be positively correlated with impervious cover (COA 2006, p. 35). Using stream data from 1958 to 2007 at 24 Austin-area sites, Glick et al. (2009, p. 9) found that the City of Austin's water quality index had a strong negative correlation with impervious cover." The draft EIS, in it's sole focus on TSS as a water quality contaminant, does not address standards or attainment goals for other possible chemical contaminants. Impacts on Salamanders: Sediments from Runoff & Construction The proposed SH45 suggests that BMPs will remove 90% of TSS, though Ross (2014) provides analyses of how this attainment goal is unlikely to be met given repeated failures of such practices at similar construction sites across Austin. Sedimentation has significant and well-known effects on both salamander physiology and habitat quality. Figure 1. Sediment accumulating in interstitial spaces between rocks in salamander habitat. These threats are also summarized in the USFWS proposed rule to list the Austin Blind Salamander as endangered (2012, pgs 50779-50781): "Excessive sediment from stormwater runoff is a threat to salamanders because it can cover habitat, cover substrates, and lead to declines in vegetative abundance and diversity (Geismar 2005, p. 2). Sediments suspended in water can clog gill structures, which impairs breathing of aquatic organisms, and can reduce their ability to avoid predators or locate food sources due to decreased visibility (Schueler 1987, p. 1.5). Excessive deposition of sediment in streams can physically reduce the amount of available habitat and protective cover for aquatic organisms, by filling the interstitial spaces of gravel and rocks. As an example, a California study found that densities of two salamander species were significantly lower in streams that experienced a large infusion of sediment from road construction after a storm event (Welsh and Ollivier 1998, pp.	

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		1,118–1,132). The vulnerability of the salamander species in this California study was attributed to their reliance on interstitial spaces in the streambed habitats (Welsh and Ollivier 1998, p. 1,128). We consider increased sedimentation from impervious cover to be a threat to all four central Texas salamanders, because it fills interstitial spaces, eliminates resting places, and reduces habitat of its prey base (small aquatic invertebrates) (O'Donnell et al. 2006, p. 34)." Furthermore, declines in Jollyville Plateau Salamander populations have been documented due to increased sedimentation in their habitat due to construction activities higher in the watershed, even though BMPs were also in place on those projects. It is already known that urbanization in the recharge zone of the EA affects salamander habitat at Barton Springs, one of the primary threats to this species. USFWS (2012, pg 50780): "Barton Spring salamander population numbers are adversely affected by high turbidity and sedimentation (COA 1997, p. 13). Sediments discharge through Barton Springs, even during baseflow conditions (not related to a storm event) (Geismar 2005, p. 12). Storms can increase sedimentation rates substantially (Geismar 2005, p. 12). Areas in the immediate vicinity of the spring outflows lack sediment, but the remaining bedrock is sometimes covered with a layer of sediment several inches thick (Geismar 2005, p. 5). Sedimentation is a direct threat for the Austin blind salamander because its habitat in Barton Springs would fill with sediment if it were not for regular maintenance and removal (Geismar 2005, p. 12). Further development in the Barton Creek watershed will most likely be associated with diminished water clarity and a reduction in biodiversity of flora (COA 1997, p. 7)." USFWS (2012, pg 50784), on construction activities: "Short-term increases in pollutants, particularly sediments, can occur during construction in areas of new development. When vegetation is removed and rain falls on unprotected soils, large discharges of suspended sediments can erode from newly exposed areas, resulting in increased sedimentation in downstream drainage channels (Schueler 1987, pp. 1–4; Turner 2003, p. 24; O'Donnell et al. 2005, p. 15). This increased sedimentation from construction activities has been linked to declines in Jollyville Plateau salamander counts at multiple sites (Turner 2003, p. 24; O'Donnell et al. 2006, p. 34). Cave sites are also impacted by construction, as Testudo Tube Cave (Jollyville Plateau salamander habitat) showed an increase in nickel, calcium, and nitrate/nitrite after nearby road construction (Richter 2009, pp. 6–7). Barton Springs (Austin blind salamander habitat) is also under the threat of pollutant loading due to its proximity to construction activities and location at the downstream side of the watershed (COA 1997, p. 237). The City of Austin (1995, p. 3–11) estimated that construction-related sediment and in-channel erosion accounted for approximately 80 percent of the average annual sediment load in the Barton Springs watershed. In addition, the City of Austin (1995, p. 3–10) estimated that total suspended sediment loads have increased 270 percent over predevelopment loadings within the Barton Springs Segment of the Edwards Aquifer." Given that (1) the SH45 study area and the state-owned ROW fall directly on top of the Barton Springs Segment of the Edwards Aquifer Recharge Zone, (2) the particular significance of Flint Ridge Cave as a recharge feature, (3) the speed at which recharge water reaches salamander habitat at Barton Springs in as little as two days (Hauwert, 2012 cited in the draft SH45 EIS), and (4) the systematic, demonstrated failure of BMPs to contain sedimentation at the construction sites documented by Ross (2014) to conclude that the proposed SH45 construction project will have little to no impact on endangered Barton Springs Salamander and endangered Austin Blind Salamander populations is intensely misleading. To quote Ross (2014, pg 6): "even if the construction project achieves the	

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		stated goal of construction-phase controls to remove 90 percent of total suspended sediment, there would still be a 10-fold increase in erosion from about 10,000 pounds per year to 100,000 pounds per year. Potentially significant environmental consequences of this increase in sediment to local karst features, threatened species, to the Barton Springs Edwards Aquifer and to spring flow and habitat are not included in the Draft EIS." USFWS (2012, pg 50784) also discusses BMPs that may be required to lessen the impact on salamander populations, including "Monitoring groundwater quality and spring flow, minimizing sediment discharges during construction, developing a groundwater impact contingency plan, locating working shafts in areas where the chance of encountering conduits to salamander springs is reduced, and rerouting conduit flow paths around the shaft if encountered." Yet, very few of these are addressed in the draft EIS. USFWS also provides examples BMP failure to protect aquifer water quality and quantity, even when they are in place. Therefore, the few BMPs mentioned in this draft EIS are not specific enough nor are sufficient to conclude that no take of listed salamanders will occur. USFWS (2012, pg 50745, Table 1) indicates that the two salamander species in Barton Springs already face 12% impervious cover across their surface watershed. Therefore, it is imperative that impacts from the proposed SH45 project be considered in the context of cumulative effects across the recharge zone of the aquifer. As we already know that salamander populations can be negatively impacted at 10% impervious cover, any additional impervious cover from the proposed SH45 project will only compound these effects and should not be considered in isolation. There is also large and accepted literature on the effects of pollutants and deterioration of water quality on sensitive macroinvertebrate species as well as on aquatic amphibians. USFWS (2012, pgs 50781-50782) cites just a small sampling of the available literature on the effects of pollutants on the physiology and indirect effects of urbanization on aquatic macroinvertebrates and amphibians. In almost all cases, there are synergistic and indirect negative effects on these species that may not have one single direct cause. There is no ecological requirement that any stressor (be it a predator, a pollutant or a change in the invertebrate community) must be direct to threaten the stability or long-term persistence of a population or species. Indirect effects can be just as important, especially when many are combined. References Ross, LE. 2014. State Highway 45 Southwest Draft Environmental Impact Statement Review. Prepared for Save Our Springs Alliance. Austin, TX. USFWS. 2012. Endangered and Threatened Wildlife and Plants; Endangered Status for Four Central Texas Salamanders and Designation of Critical Habitat. Federal Register Vol 77 No. 163 pgs 50768-50854. USFWS 2013. Endangered and Threatened Wildlife and Plants; Determination of Endangered Species Status for the Austin Blind Salamander and Threatened Species Status for the Jollyville Plateau Salamander Throughout Their Ranges. Federal Register Vol 78 No 161 pgs 51278-51326. Table 1. Accident/Spills Reported to National Response Center's Database for Spills and Accidents for Travis County, TX 1990-2012. SUBSTANCE AIR LAND SOIL SUBSURFACE WATER "ISO TOX" 1 134A (NEW REFRIGERANT) 1 ACETONE 1 ACID 1 ACID WASTEWATER 1 ACIDIC WASTE WATER 1 AFFF 1 ALGICIDE 1 AMMONIA ETCH 1 AMMONIA, anhydrous 6 2 ANTI-FREEZE 1 ANTIFREEZE 1 ASBESTOS 1 ASPHALT 1 BATTERIES 1 BATTERY (LARGE INDUSTRIAL TYPE) 1 BATTERY ACID 1 BENDMYL 1 BENDOMYL 1 BETASAN 1 CARBON MONOXIDE 1 CASORON 1 CHLORINE 1 CHLORINE - GAS 1 CHLORINE GAS 1 CHLOROFLOUROCARBONS 1 CHLOROFORM 1 1 CLARIFIER 1	

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		COPPER CHLORIDE (ic) 1 CREOSOTE 1 CUPRIC CHLORIDE 1 CUPRIC CHLORIDE SOLUTION 1 DIAZINON 1 DIBASIC ACID SOLUTION MIXED WITH WATER 1 DIELECTRIC FLUID/LOW LEVEL PCB 1 DIESEL FUEL 1 DOLOMITIC QUICK LIME 1 DRY ACID GRANUALS 1 DURSBAN 1 ETHYLENE GLYCOL 2 1 ETHYLENE OXIDE 1 F006 SLUDGE CONTAMINATED MATERIAL 1 FIRE ANT KILLER 1 FORM RELEASE COMPOUND 1 FORMALDEHYDE SOLUTION (37 PERCENT SOL.) 1 FREON 2 GASOLINE VAPORS 1 GASOLINE: AUTOMOTIVE (4.23G PB/G 2 1 1 GASOLINE: AUTOMOTIVE (UNLEADED) 8 1 12 GASOLINE: AUTOMOTIVE UNLEADED 1 1 GEAR OIL 1 GREASY WATER 1 HEAVY METAL SLUDGE 1 HELICOPTER FUEL 1 HYDRAULIC OIL 1 9 HYDROCARBON 1 HYDROCARBON FLUIDS 1 HYDROCHLORIC ACID 1 1 1 HYDROCHLORIC ACID OR CUPRIC CHLORIDE 20% 1 HYDROCHLORIC ACID-37% 1 HYDROFLUORIC ACID 1 ISOPROPYL ALCOHOL 1 JET FUEL: JP-4 2 JET FUEL: JP-5 (KEROSENE, HEAVY) 1 1 JET FUEL: JP-8 3 3 JET FUEL: JP-8 (JET A) 1 LEAD 1 LEAD ACID BATTERIES 1 LIME 1 LIQUID AMMONIA WITH LIQUID BLEACH 1 LIQUID EDGER 1 MERCURY 3 METHYL ALCOHOL (15 PERCENT SOL.) 1 METHYL ETHYL KETONE (PEROXIDE) 1 MURATIC ACID 1 N-BUTYL ETHER 1 NA3082 METAL PLATING WATER 1 NATURAL GAS 16 1 1 NICKLE 1 NO. 5 FUEL/OIL 1 OIL LIKE SUBSTANCE 1 OIL, EDIBLE: VEGETABLE 1 OIL, FUEL: NO. 1-D 1 1 OIL, FUEL: NO. 2 1 2 1 OIL, FUEL: NO. 2-D 4 9 OIL, FUEL: NO. 5 2 OIL, MINERAL PCB CONTAMINATED 1 OIL, MISC: LUBRICATING 2 10 OIL, MISC: MINERAL 4 7 OIL, MISC: MOTOR 14 2 1 10 OIL, MISC: TRANSFORMER 1 2 3 OIL: CRUDE 1 OIL: DIESEL 8 2 10 ORTHENEX 1 ORTHO-KLOR 1 ORTHOCID 1 OTHER OIL 1 3 OTHER OIL - TURBINE OIL 1 OTHER OIL (GEAR OIL 80-90 WEIGHT) 1 OXYDIZER 1 PAINT 1 1 PESTISIDE "MALATHION" 1 PESTISIDE "ORTHENE" 1 PHEMALDEHYDE 1 PHENOL 1 POLYCHLORINATED BIPHENYLS 4 4 POLYCHLORINATED BIPHENYLS (10.7PPM) 1 POOL SHOCK TREATMENT 1 PROPANE 1 PROPYLENE OXIDE 1 RAW SEWAGE 1 REFRIGERANT GASES 10 SANDY PACK POWDER SOLUTION 1 SANI PAC SP 73000 1 SAVIN 1 SEWAGE 3 2 SODIUM 1 SODIUM HYPOCHLORITE (15% OR LESS 1 SODIUM HYPOCHLORITE 12.5 1 STYRENE 1 SULFURIC ACID 1 1 3 TETRACHLOROETHYLENE 1 TETROLITE(15% METHYL ALC, 70%QUARTERNARY AM CL) 1 TRANSMISSION FLUID 1 TRETARY BUTYL PHENLO 1 TRIMETHYLAMINE 1 TRIOX 1 UNKNOWN CHEMICALS 1 UNKNOWN MATERIAL 6 3 6 UNKNOWN MATERIAL (CHEMICAL DYE?) 1 UNKNOWN MATERIAL (GREEN) 1 UNKNOWN OIL 5 16 VAPAM 1 VEGATABLE OIL 1 VEGETABLE OIL 1 WASTE 1 WASTE CORROSIVE ACID 1 WASTE OIL 4 2 WASTE POSITIVE PHOTO RESIST 1 WASTE WATER 1 WASTE WATER SLUDGE 1 WEED-B-GONE 1 (blank) 3 Grand Total 79 126 15 5 147 Appendix A: Professional Qualifications J. HAYLEY GILLESPIE Curriculum Vitae Austin, Texas | (512) 964-0841 | hayleygillespie@utexas.edu Education 2011 University of Texas at Austin (PhD), Ecology, Evolution & Behavior Dissertation title: The ecology of the endangered Barton Springs salamander (Eurycea sosorum) 2005 University of Utah, coursework in stable isotope ecology (Salt Lake City, UT) 2003 Austin College (BA), Biology, Environmental Studies & Art (Sherman, TX)	

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Michael	Eichelmann	I have lived off Brodie Ln for nearly 20 yrs and seen how a quiet neighborhood like Shady Hollow or my street and others that come to Brodie Ln were transformed first by the opening of Brodie Ln to 1626 and then the traffic growing over the years exponentially. I Have witnessed so many accidents and had some very close calls myself trying to get out of my street. When Brodie Ln was opened to 1626 we were told that sh45 would be built in a couple of years, this was like 18 years ago. I can't believe the selfishness of the people that are opposing the construction of SH45 because they don't want the traffic on Mopac witch is already going there but instead of having an efficient and more direct route they have to go through neighborhoods and much inferior roads that were not meant to handle the traffic or the pollution that is generated by all those cars crawling along Brodie and Manchaca. Again Loop 1 (Mopac) was built as an expressway and is meant and designed to handle the traffic. The environmental concerns to build SH45 have no merit as the Road is being designed with the most care to the environment and all the technology to keep pollution the the lowest possible attainable. I really believe that the net result will be a great reduction of pollutants going to the aquifer by having traffic flow more directly to Loop 1 instead of the current roads. Most people that oppose SH45 I feel in reality are more concerned about opening up their Private little part of mopac than they are about the environment. Please I ask you build SH45, it makes sense and we have waited long enough.	2014-08-13 23:11:10

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Robert	Schneider	I am a member of the Austin ISD Board of Trustees representing Southwest Austin and more specifically the portion of the proposed SH-45 extension. I am writing in an effort to make your organization aware of the impact of the proposed SH-45 extension on Austin ISD facilities, attendance zone patterns, and transportation issues. While I am writing in my capacity as an elected official representing Southwest Austin, I am not speaking for the Austin ISD Board of Trustees. The lack of transportation infrastructure in Southwest Austin negatively impacts the efficiency of use for Austin ISD facilities and increases transportation time and costs associated with getting children and families to Austin ISD schools and school functions. In effect the lack of transportation infrastructure creates a wide barrier that separates families along the South Mopac corridor continuing West from those families along the Brodie Lane corridor continuing East. This barrier creates an attendance zone boundary that causes Austin ISD facilities to be over-crowded because the district is unable to balance attendance zone populations because of the long and costly transportation issues that are associated. As an example, homes in the Grey Rock sub-division that is located at the Southern end of Mopac are currently zoned to go to Baranoff Elementary School. Baranoff Elementary School is located just to the East of Brodie Lane at 12009 Buckingham Gate. This means that those families purchasing homes in the Grey Rock sub-division will be placing their children on an Austin ISD bus that must travel North on Mopac to Slaughter Lane, then travel East on Slaughter Lane to Brodie Lane, then travel South on Brodie Lane and finally arrive at Baranoff Elementary School. In the process they will pass three Austin ISD schools that are geographically closer to their homes but are unavailable to them because each of the schools is over-crowded to the point that it is not possible to allow additional children to attend the school. This travel burden is being placed on children that attend Kindergarten through Fifth grade as well as their families. By constructing the proposed SH-45 extension it would significantly reduce travel time and cost to Austin ISD. It would also increase the options available so that Austin ISD may more efficiently balance facility use. As someone who studied a considerable amount of geology in college and then spent the better part of a career working with geological data and computers, I am very aware of and sensitive to the environmental arguments that have been made regarding the environmentally sensitive nature of the land in question. As a resident of Southwest Austin I also want to see the preservation of the quality of life that I have enjoyed in Southwest Austin for the past 26 years. I also fully understand though that the proposed extension could be built with no significant environmental impact and would greatly help Austin ISD in the budget and efficiency issues it faces. Please feel free to contact me with any questions you may have. Robert Schneider Trustee, Austin ISD	2014-08-13 23:13:28
Doris	Humphrey	Just want to make a few comments regarding SH 45. I've lived in Shady Hollow now for 23 years. I voted to have sh45 completed and it is very disappointing that our voices were ignored. The traffic on Brodie has become dangerous. Brodie is not equipped to be a major artery. Recently I've been leaving the house at 7:30am to drive 4 boys to band practice. The traffic on Brodie was going 9 mph this morning and crawling at a very slow pace. Fellow neighbors from adjoining streets have to be let in because the line of traffic is never ending. It's become customary to slow down and flash your lights so that shady hollow residents can access Brodie. It's still summer and I hate to think how bad the traffic is going to be when school starts. The problem will only worsen if sh45 is not built. Environmental issues are important to all of us. The Edwards aquifer will be better protected if 45 is	2014-08-13 23:32:20

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		built. Brodie traffic is also putting the aquifer at risk. New construction of 45 will be able to put in those safeguards.	
Ronald	Hill	I am fully supportive of the completion of SH45SW -- it is a project I voted for 20 years ago and it should have been built long ago. Austin is notorious for being behind the transportation infrastructure curve and delaying SH45SW once again would fit that frustrating pattern. I would recommend that underpasses be built at Slaughter, traffic lights installed at Escarpment & 45, and no through trucks be permitted on Escarpment (we don't want a repeat of the disaster at Brodie Lane)!	2014-08-13 23:49:29
Claudia	Corum	SH45SW is NOT the answer to Hays Country traffic coming into Austin. It will simply transfer the traffic now using Brodie Lane, Manchaca, and South 1st to the lower end of MoPac. MoPac is already jammed, gridlock at times. There is NO reason to add more traffic, and certainly not before the improvements to MoPac have been made. The rushed through EIS is incomplete, in several instances studies were not complete, results were not posted. It is clear that proponents of this road wish to rush it through before a more environmentally oriented Commissioners Court is seated in Jan. 2015. All safeguards and all reason have been cast aside in favor of developers who will benefit from building along the new SH45 leg. Don't believe me, just look at the real estate listings (from Gladstone and from Caldwell Company, among others) offering up "prime real estate, zoned commercial, at THE FUTURE INTERSECTION OF SH45SW and 1626" The community of Circle C will be most hurt by this road. The December 2013 CAMPO study shows a doubling of traffic in this area (along Escarpment) and a frightening increase of traffic along the existing part of SH45 that forms the southern boundary of Circle C. (CAMPO study shows a 55% increase in traffic on 1826, that would necessitate it traversing the existing portion of SH45. Circle C faces having super highways on both its eastern boundary and southern boundary. In both cases, new and big roads will cut off one neighborhood from another. The people on Brodie Lane complain about just this sort of thing and deserve better answers than just transferring the traffic to cut through another neighborhood. -Finish the EIS correctly and hold it to Federal standards. -Look at alternatives, including improvements on I35. -Give residents who will be directly affected a legitimate plan for improving MoPac to handle the influx in traffic. -Do NOT build SH45SW. It was a campaign promise to big donators and unhappy residents in Shady Hollow. Give them a better solution. This is a boondoggle, pushed by CAMPO members from Hays County, paid for by Travis County, and residents of southwest Austin who use MoPac will suffer. In short, even thinking about SH45SSW	2014-08-13 23:55:39

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Bill	Bunch	On behalf of the Save Our Springs Alliance, I am submitting a proposal for a new alternative to be studied, which we are calling the Shared Solution Alternative. The text of our proposal is very long, and we do have it as a .pdf file, but I don't see a way to upload a pdf. So I will attempt to submit the entire text through this format, but if it doesn't work then we hope you will let us know so that we can provide you with the document in a better format. A Shared Solution for Future Livability and Mobility: An Alternative to the Mopac/SH45SW Loop Executive Summary The Save Our Springs Alliance proposes that TxDOT study a new alternative that has not yet been studied. We call this alternative a “Shared Solution” alternative, which means a combination of many small actions that each contribute to Purpose and Need, and sum together to share in an overall solution that will prove more effective, more sustainable, and more valued by affected communities and stakeholders than the proposed freeway extension. This paper outlines generalized key elements of the Shared Solution, along with a proposed methodology for developing and analyzing specific projects in the Shared Solution. Strategy 1, Boulevards with Innovative Intersections: Eliminating left-turn phases can be cheaper, safer, and more effective than widening arterials or diverting traffic to freeways • Create concept sketches of opportunities at several locations. • Conduct fatal flaw analysis, refinement, cost estimation • Micro-simulate to determine Level of Service, congestion relief Strategy 2, 7D Boulevard Communities and Activity Centers: Density, Diversity, Design, Destinations, Distance to Transit, Demographics, and Demand Management all play a role in reducing Vehicle Miles Traveled and creating great places where walking is commonplace, transit is attractive, and short drives replace long commutes. • Create 7D projects that support Austin’s growth vision • Invest in non-vehicle Complete Street right-of-way and amenities. • Create artistic renderings of results, sufficient to estimate impacts and communicate benefits. Strategy 3, High Frequency, High Visibility, Low Cost Transit Circulators: If you design transit that is frequent, fair (as in fare), fast, familiar, focused, and fun, you can double or triple ridership. Austin once got great ridership from free transit, but discontinued due to vagrancy problems and overcrowding. Newer strategies with fares can address these issues. • Identify routes, attributes, ridership strategies, and cost minimization strategies, aiming for both impressive boardings per mile, and low costs per new rider • Convert ridership gains to congestion reduction benefits; identify funding strategies Other Potential Strategies • I-35 freeway optimization through preventive ramp metering • Balance jobs and housing across region, so there is less need to travel to Downtown • Parking ideas to encourage transit usage without hindering the attractiveness of downtown. • Sequencing—build things in the right order, for maximum effectiveness Approach: Develop Shared Solution iteratively, selecting small projects with the most bang for the buck. Work in conjunction with experts & stakeholders primarily responsible for Shared Solution ideas. What is a Shared Solution? A Shared Solution includes a wide array of strategies that when combined, should add up to an impressive return on investment, ideally with lower costs and more positive impacts than the proposed freeway solution. It is possible that a Shared Solution will have higher impacts in some categories than the proposed freeway, but it may still prove viable and preferred by communities and stakeholders. Why? Because it will have significant congestion relief benefits, but also community-building and economic development benefits that the freeway-only solution lacks. It is these other benefits, often overlooked in freeway environmental studies, that could result in communities and other stakeholders surmising that the overall benefits more than compensate for	2014-08-14 00:05:15

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		any impacts of a Shared Solution. But it is not clear to many stakeholders who are interested in a thorough investigation of a non-freeway solution the extent to which there has been an attempt to create a truly competitive non-freeway alternative. For example, a scenario that randomly widens existing arterials beyond what is planned would obviously be very destructive. But some arterials may not really need widening, especially if innovative intersections are used to create similar congestion relief benefits, but with less destruction and great community-building features. Small actions are also less disruptive and less expensive, so there is room to aggregate many together to form a Shared Solution. They then may have a strong aggregate effect on congestion not unlike the proposed freeway, but also prove more desirable due to other measures of effectiveness, besides just congestion relief. Communities may have reluctantly supported the long-planned freeway extensions partly because they have not yet seen a good-faith effort to develop an attractive non-freeway solution. When such an effort is finally made, it may well prove to be the least damaging, practicable alternative required by resource agencies and by the community. Context and Theme for Developing and Analyzing a Shared Solution The Clean Water Act requires that when a significant amount of wetlands or other water resource will be damaged by the proposed alternative, the sponsoring agencies must select the least damaging practicable alternative that meets their purpose and need. Given the concerns of a large number of citizens who do not want the freeway and are not convinced it is necessary, as well as the requirement of conclusively demonstrating that there is no practicable alternative to the freeway, it is incumbent upon TxDOT to truly demonstrate that they will make a serious effort to develop and analyze the best non-freeway alternative that can be developed. No such serious attempt has yet been made, but many experts assure us that such an alternative can be developed, and if properly analyzed should result in something impressive for congestion relief, economic development, environmental responsibility, and community building. At present, our proposed Shared Solution has several specific categories of investigation, but within those categories actual project proposals and analysis methods are still largely undetermined. This document outlines what we see as important steps for both developing and analyzing a Shared Solution, but not necessarily a comprehensive list. Other potential strategies, analytic methods, and project refinements will likely emerge through the process, just as occurred during the process of arriving at the currently preferred freeway alternative. Developing the Shared Solution should be approached as if avoiding the freeway extension and associated impacts were the preferred idea in the first place. The freeway then becomes a secondary fallback if efforts to avoid it prove ineffective or unpopular. That way the TxDOT development and analysis team will be more likely to approach each Shared Solution idea as if it might actually be a good idea, and hence put respectable effort into making each SS project the best that it can be. Steps Required to Develop and Analyze a Shared Solution 1. Review the universe of project types, policies, and operational management strategies that can in theory reduce the need for a Mopac extension, even if just by a seemingly small amount. 2. Consult with experts well known for their knowledge of a given strategy to determine the potential costs, benefits, and impacts of each strategy. 3. Ask their opinion on best practice approaches for evaluating costs, benefits, and impacts in an apples-to-apples manner vs. the preferred alternative. 4. To the extent that a potential element in the Shared Solution might have other benefits not specifically sought for in the Purpose and Need, determine best practice methods of quantifying these other benefits for purposes of full disclosure of impacts (i.e., incidental benefits	

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		are positive impacts that need to be disclosed in an Environmental Impact Statement). This way communities and stakeholders can understand and appreciate both primary and secondary positive impacts just as they are informed of both primary and secondary negative impacts. 5. Secondary benefits, or impacts, of the Preferred Alternative that are not specifically sought for in the Purpose and Need should also be identified for consistency and objectivity. 6. In light of expert opinions on evaluation strategies for all potential elements, both freeway and non-freeway, agree upon a general methodological approach for determining both positive contributions and negative impacts of each element. 7. From the universe of non-freeway general elements, identify as many specific project opportunities as possible. From the resulting projects list, select elements for inclusion in the 1st iteration of the Shared Solution based on a "low-hanging fruit" approach – i.e. project ideas likely to result in the most congestion relief for the least amount of money or impacts, and with the strongest likelihood of community support would be added first. 8. The cutoff for a project's inclusion in the first iteration Shared Solution is when the initial guess at the sum total cost of Shared Solution projects exceeds the cost of the Preferred Alternative, then remaining project ideas must wait for another iteration before further consideration. 9. Once first iteration projects are on the table, those projects can be more methodically evaluated to determine likely congestion relief, likely right-of-way (ROW) impacts, and a refined cost range. If a first iteration project seemingly would have significant congestion relief, but appears to have serious or maybe even fatal flaws, some effort should be made to correct its flaws or lower its costs in an acceptable way (i.e. don't dismiss an idea at the first obstacle). 10. The effects of each project might be classified according to the following five categories: a. Primary positive benefits: those specifically sought for by the Purpose and Need b. Secondary positive benefits: side-effect benefits as well as benefits intentionally sought after to make the project more palatable to affected communities. c. Primary negative impacts: As traditionally defined by NEPA—acres of wetlands consumed, acres of new right-of-way, number and nature of directly affected properties, etc. d. Secondary negative impacts: As traditionally defined by NEPA—air quality, sound, induced demand, land use affects, etc. e. Costs: What is a likely range for the overall price tag of the projects? 11. With a project's first iteration effects known in each of these categories, it is easy to rank projects according to weights placed on each of the five categories by a Steering Committee. 12. Projects with high negatives relative to positives should be assessed. Can negatives be minimized in some way to make the project attractive? If not, these projects could be excluded from the second iteration. 13. At the end of an iteration, the sum total of all categories can be compared against the sum total of the same categories for the preferred alternative. The ranking criteria used to screen small projects for the Shared Solution may also be used to evaluate the Preferred Alternative against the sum total of individual non-freeway projects as a single Shared Solution. 14. If first iteration costs were less than initially assumed, or if some project ideas fall off the list of attractive elements for the Shared Solution, then other project ideas previously passed over, or spin-off ideas that have occurred since the first iteration, could be evaluated and ranked to determine their attractiveness for inclusion in the second iteration. 15. If first iteration costs were more than initially assumed, which individual projects can have their scope scaled back without losing too much of the primary and secondary benefits that made it attractive in the first place? Which projects should be dropped from the second iteration? 16. Use two or maybe three iterations for a fully developed Shared Solution, complete with a fair estimate of each	

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		individual project's benefits, costs, and impacts, to see how well the sum of the parts meets purpose and need, and stacks up as a practicable alternative to the preferred alternative. If it appears competitive, or at least has many attractive, competitive elements, it can then be advanced through any remaining required NEPA analysis and public input, to determine if it can emerge as the new Preferred Alternative. Even if the Shared Solution can be shown to be technically superior to the Freeway Solution, the public, stakeholders, communities, and agencies may still reject certain projects or elements that were proposed for the Shared Solution for political or other reasons, resulting in a "Partial Shared Solution" of projects that are acceptable to the community. If the original Shared Solution is whittled down so much that it would prove ineffective relative to the benefits of the proposed highway, then perhaps a hybrid solution could be created, whereby the most effective and popular elements of the Shared Solution are sequenced first, while a highway corridor, perhaps of lesser width and design criteria, is preserved to be implemented last, if the next generation determines it to be useful at that time. Or even if enough of the full Shared Solution is embraced by the public, sufficient that it would be an effective replacement for the freeway, the public may still desire to preserve the option to build something someday within the freeway alignment, but defer to the next generation to decide if a roadway be built at all, and if so, whether it should it be a full freeway or something else. That case seemingly would produce a similar outcome, where non-freeway elements are sequenced first, along with corridor preservation, but roadway construction within the corridor is intentionally required to be after 2040 so that the next generation can determine its value at that point. Shared Solution Key Strategy: Innovative, Alternative Intersections An "Innovative Intersection" is a general term used to describe any intersection strategy that is able to eliminate left-turn phases from a major intersection by handling lefts in some other way than traditional left-turn pockets and arrows. The result in every case is greater efficiency, which translates into more capacity and less delay without widening arterials. We anticipate that Innovative Intersections will be a significant element of a Shared Solution alternative to the Mopac Extension. Designs that are more compatible with multi-modal environments should be top priority, reverting secondarily to the more auto-oriented solutions. Here are the general steps involved in developing and analyzing locations for these designs. 1. Locate all signals in the study area that have, or are likely to have, dedicated left-turn phases. 2. Are any of these locations failing now? Does the future traffic forecast expect them to fail? 3. For candidate locations, study each situation. Create concept sketches for Quadrants, Town Center Intersections, Bowties, and Sync-Streets, which are all highly compatible with mixed-use, multi-modal environments. If preferred concepts won't work, move on to continuous flow intersections (CFI), Thru-Turns, etc., which all reduce congestion, but are less compatible with multi-modal environments. 4. Initial concept sketches can be as simple as drawing lines with a felt-tipped pen or in Google Earth, meant only to prompt operational and design engineers to think about the implications, looking for flaws and for ways to correct the flaws, and communicating their thoughts back to the concept originators to see if together they can find workable solutions or not. 5. Travel demand models such as the CAMPO model are usually inadequate for determining congestion relief due to Innovative Intersections. Feasible concepts should be micro-simulated, to determine congestion relief. A software modeling program such as Synchro can probably be used most of the time (Synchro is much less time consuming than complex software like Vissim). While it is difficult to truly model many designs in	

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		Synchro, there are still good ways to use it for approximating benefits, such as removing lefts completely from the intersection (Quadrants and CFIs), or routing them as throughs, then rights (Bowties, Thru-Turns). 6. Once microsimulation determines expected benefits, those benefits often can be input to travel models such as the CAMPO model and manually set the speed and capacity of approach and egress links. Shared Solution Key Strategy: 7D Boulevards and Activity Centers Boulevard Communities and Activity Centers use "7D Place-Making" strategies to bring renewed economic development and catalyze major private investment into the designated area. Concepts can be applied to new developments, but more commonly they are applied to aging and hap-hazard commercial areas that decades ago were new and lively, but have since plateaued or stagnated. There are many major benefits of such 7D Places—transportation benefits are significant, but not necessarily the most important. Transportation benefits include more walking, biking, and transit—especially valuable to youth and the emerging wave of seniors who may not want to drive, or shouldn't drive. Reduced Vehicle Miles of Travel (VMT), and reduced Vehicle Hours of Travel (VHT) are also likely. Delay and congestion may still exist within Activity Centers—there is a lot of activity packed into a fairly small space, after all. But with good connectivity, innovative intersections, and multi-modal circulation, delay can be minimized. Reduced delay as measured by traffic engineers is not necessarily an ideal goal. For example, consider a suburban sprawl scenario, where homes are usually very far away from jobs vs. a scenario that focuses mixed-uses into Activity Centers spread across the region. Would you rather travel 40 miles in 40 minutes on freeways with zero delay, or travel file miles in 15 minutes down beautiful arterial streets, experiencing 3-minutes of delay? The shorter time result often still ranks poorly by the math that engineers often use to rank projects. Such measures of beneficial impacts should be at least disclosed and included in weighting criteria for selection of a preferred alternative. The 7Ds are summarized below, after which is an outline for how to encourage the creation and success of such "Places." What are the 7Ds? 1. Density—as an activity center increases in density, VMT per capita decreases. When there are more things close together, you are more likely to walk, bike, or ride transit. Or if you do drive, it is more likely to be a short drive. 2. Diversity—When most houses are in suburbs, and most jobs, entertainment, and many necessary items are in the regional center, the result is an extreme lack of diversity that results in huge amounts of driving. But if more areas can be diversified with their regional fair share of quality retail, office, entertainment, housing, and a general diversity of uses, many more people will end up very close to goods and services they need. 3. Design—If the local street system within an Activity Center has more connections (less circuitous and fewer cul-de-sacs), it will be easier for more people to use transit, or to walk, bike, or take short drives. Also, Complete Street design features such as large-canopy trees, on-street diagonal parking, planted medians with pedestrian refuge, street furniture, wall-to-wall ground-floor retail with mixed uses on upper floors—all of these things create market momentum that results in fantastic, walkable places over the years. 4. Destinations—Part of what helps define a Place or an Activity Center, is that it has lots of great jobs, great shopping, and great entertainment—popular destinations that attract people from all the surrounding neighborhoods. Transit then has a target to aim for, and there is less need to drive far if great destinations are close by. 5. Distance to Transit—It does little good to build expensive transit infrastructure, and then put a used car lots and a gas station as the first uses next to transit stations. People use transit if transit is close, so communities	

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		are wise to adopt minimum zoning standards within a quarter mile of a transit station (such as at least 40 units per acre if residential, or at least four-story office buildings with ground-floor retail, if commercial). Free, frequent transit shuttles can act as “moving sidewalks”—extending the reach of regional transit, and making it easier to circulate within the Center without a car. For more square footage near transit, it is also good to relax or eliminate parking standards (perhaps in trade for something). Developers know they must provide adequate parking anyway, even in transit-oriented areas, so why force them to install empty spaces? High density doesn’t have to mean cheap, problematic apartments that degenerate quickly. Form-based zoning can require all buildings in the area to meet a certain architectural and quality standard. 6. Demographics—Many people want to live in higher density, walkable, mixed-use areas where they can take transit and won’t have to drive as much—growing numbers of seniors need to, and many who are not yet raising families want to. But if the only quality places available are single family homes designed for raising kids, they’ll end up in those even if they’d prefer something else. If we design Activity Centers with our changing demographics in mind, our parents and children can stay close by. Then they need not contribute to congestion, and the elderly can avoid “white-knuckle” driving conditions. 7. Demand Management—When vehicle demand is too high, we have three options: 1) Increase supply to match demand, 2) Manage demand to available supply, by making it easier and desirable to choose something else; and 3) just accept the misery (which by default limits demand to supply, but in an unhappy way). If new construction isn’t an attractive option, there are a number of demand management policies that can help reduce the need for construction. Making 7D Boulevards & Centers Part of the Shared Solution 1. Identify the region’s priority locations for mixed use, redevelopment, and higher density development. Seek to include improved bikeways, on-street diagonal parking with frontage access roads, sidewalk bulb-outs into intersections, planted medians, greater connectivity, and quality transit stops. Also identify potential transit shuttle circulation routes and frequencies. 2. Rate parcels in the general vicinity based on likelihood or desirability of potential change. Invite city officials to participate in the rating. Some locations, such as single-family homes, will be unlikely to intensify regardless of the investments. Vacant parcels or struggling commercial may be very desirable to change and intensify. 3. Lay out potential locations in SketchUp (computer design program) for two purposes: 1) allows impacts from needed right-of-way to be determined and compared with the desirability of change parcel map, to reflect that some impacts and resulting changes may not be so onerous, if changes are desirable anyway; 2) allows affected communities and stakeholders to envision the potential outcome and see the affected right-of-way slivers in order to have an informed opinion on the tradeoffs. 4. Work in conjunction with operational and design engineers. 7D features would often be included as part of Innovative Intersection proposals, so engineers should review Complete Street proposals for necessary adjustments. 5. Convene local/national 7D and economic development experts to weigh in on the range of potential market responses to the package of investments at the various sites. What mix and density of uses would probably occur given existing land use regulations? Could even more positive development occur if communities adopted form-based codes, removed minimum parking requirements, etc? Could new jobs,services, or housing be attracted into key areas to help create better jobs/housing ratios? If 7D sites achieve the mid-range of potential market responses, what kind of affect would it have on VMT, VHT, Congestion, Delay, Walk/Bike trips, Transit Ridership, Farmland consumption, and other	

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		measures of effectiveness? Would it have a positive or negative outcome on a municipality's balance between tax receipts and required expenditures? 6. A good Shared Solution should consider setting aside funds to assist communities with creating form-based code development in key locations, and with funds for planning the architectural and operational layout of a Complete Street plan that will work well for each situation. Why include 7D Centers in Shared Solution? Many and perhaps most of the benefits of 7D Boulevards and Centers are found in performance measures outside of just congestion relief. So why spend money and create impacts to get Complete Streets when so much of the benefit is not just about congestion relief? Because reducing auto congestion is only part of what citizens care about. We believe they also care about a legacy of beautiful, livable corridors with thriving businesses, healthy lifestyles, reduced consumption of farms and wild habitat, and a wider array of mobility options for all citizens—especially for the growing numbers who cannot drive safely in white-knuckle, high-speed conditions. Thought Experiment Suppose the end result of the Shared Solution is that it meets Purpose and Need in that it reduces VMT in congestion by an impressive amount, but say that amount is only 80% of the level that the DEIS freeway extension achieves for this primary objective. But suppose that on secondary objectives the Shared Solution will achieve far better results for economic development, multi-modal usage, reduced farmland and wetland consumption, and property impacts that are usually in harmony with desired redevelopment anyway. Is it then correct to conclude that the freeway should be preferred over the Shared Solution because it was slightly better at achieving a narrowly defined purpose and need? We contend that both solutions should be presented to the communities that have to live with the result to see what weight they place not only on benefits directly included in purpose and need, but also other beneficial side-effects of each scenario. In this case, they may well favor the Shared Solution, because a healthy, thriving community is about more than simply reducing congestion. Crafting a solution with Complete Streets that is in harmony with Austin's sustainability goals is an essential element of presenting the public with an alternative vision. That way, the non-freeway alternative may well prove to be the least damaging practicable alternative—practicable because communities decide beautiful, multi-modal streets are the future they'd rather have, even if they end up only 80% as effective at reducing congestion in the near term. High Frequency, High Visibility, Low Cost Transit Circulators Why do so few people ride regular buses? Many reasons, but a significant reason is unfamiliarity with the system. People see buses here and there, but few know where they came from or where they are going unless they actively seek out the route map and schedule. Part of the reason light rail and Bus Rapid Transit gets good ridership is because the vehicles are unique, and there is a visible path. Virtually everyone passively knows the path, and can then easily elect to use it for trips along that path. But these systems require dedicated right-of-way and expensive construction, which requires them to achieve huge numbers of riders in order to have a good cost / benefit ratio. Dedicated right-of-way creates visibility and speed advantage, but there are other very low cost strategies that create great visibility and speed advantages as well. These strategies will work even better when supported by sustainable land use visions and codes. 7D Activity Centers generate a lot of internal trips. Many will be walking and biking, and if not that then short drives, but if there is too much need to drive then streets will be excessively congested. People will be willing to ride transit shuttles for short trips, if the trip is low-cost or free, the wait time is not excessive, and generally incorporates strategies for attracting high-ridership at a low cost.	

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		Circulators can also help reduce regional and I-35 congestion, by connecting more people to regional transit. With strategies like queue jumping and branding, circulators can achieve impressive ridership with very low capital investment, thus helping them achieve good cost per new rider ratios potentially more impressive than either light-rail or BRT. Steps involved in making Transit Circulation Part of the Shared Solution 1. Identify potential circulation routes, aiming to connect regional transit to job centers. 2. Determine service attributes for two target markets – those connecting to regional transit, and those desiring only to circulate within the Activity Center itself. 3. Determine a branding strategy that will increase the likelihood that citizens will become passively aware of the origins and destinations connected by the circulators. 4. Determine appropriate vehicles—smaller, more nimble, efficient shuttles can carry more people than full-sized buses, if those shuttles are coming by more frequently. 5. Determine appropriate phasing—on one hand, circulation within Activity Centers will be more widely used in later phases when the market has successfully transitioned to a 7D place, but on the other hand the presence of good circulation early can help catalyze such 7D places. 6. Determine likely ridership – Some aspects of this type of transit have never really existed in Austin, so the CAMPO model may not be adequate for predicting ridership. Estimates may need to be created or supplemented by 7D or other evaluation strategies, such as ET+. 7. Convert ridership gains into equivalent congestion reduction benefits. 8. Determine funding strategies—will costs per new rider be impressive enough for local and federal funds? Are there other strategies to make up any shortfalls in costs? A primer called “Making Buses More Like Trains” is available at MetroAnalytics.com in the Downloads section, which would form much of the basis for our ideas on devising popular-yet-affordable transit. An excellent video of Boulder, Colorado’s hop-skip-and-jump routes can be seen at http://vimeo.com/12472216. Boulder’s system shares many aspects with the circulation strategy described here, and highlights the low-cost, high-ridership gains that are possible. Making I-35 and MoPac More Efficient: Freeway Optimization via Preventive Ramp Metering Freeways are supposed to be able to carry about 2,200 vehicles per hour per lane (vphpl), and they usually will do that – for about 15 minutes. But when more traffic is allowed on than can fit, freeways get mired in stop-and-go and their throughput drops down to just 1,500 or so – a loss of about 30 percent! That means we have 100% efficiency at 3 pm when there is only 70% demand, but sadly we also have just 70% efficiency at 5 pm when there is 100% demand. Or in other words, suppose I-35 is worth $3-billion. That means we lose $1-billion of its value when we inadvertently allow it to fail, exactly at the time we need the full $3-billion worth of capacity. Then there is billions in lost productivity on top of that. The historic solutions to this problem are to just build more, but that is like replacing your V-8 engine with a V-12, because three of the cylinders have stopped firing. Has anyone considered getting serious about a tune-up? “Freeway Tune-ups” are technically easy!— Widening and extending freeways is politically popular, partly because it is how things have always been done. Everyone hates freeway congestion and the obvious way to reduce it is to make more and bigger freeways. But it is getting so expensive it would be wise to at least consider other options. Society usually instructs engineers to increase supply, but it is also relatively simple for engineers to instead devise systems where demand will not exceed existing supply. First you improve their options for avo	

Letter Comments

S.O.S.

SAVE OUR SPRINGS ALLIANCE

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AUSTIN, TX

August 13, 2014

Texas Department of Transportation
Austin District
Attention: Stacey Benningfield
P.O. Box 15426
Austin, Texas 78761-5426

CMR 7013 1090 0000 4339 2448

Re: Comments on State Highway 45 Southwest

Dear Ms. Benningfield:

Enclosed please find a report titled *"State Highway 45 Southwest Draft Environmental Impact Statement Review"* generated by Dr. Lauren Ross of GlenRose Engineering, Inc., on behalf of Save Our Springs Alliance, Inc. This report is submitted as a compilation of comments on the SH 45 SW Draft Environmental Impact Statement.

If you have any comments or concerns please feel free to contact me at 512.477.2320 ext. 305 or by email at adam@sosalliance.org.

Sincerely,

Adam Abrams
Staff Attorney

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Paper from responsible sources
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State Highway 45 Southwest Draft Environmental Impact Statement Review

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August 2014

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Photograph 17. (Photo 30) Another area of sediment-covered ground downstream from project erosion/sediment controls, likely generated from highway construction. 21

Photograph 18. (Photo 34) Photograph illustrates a silt fence that is overtopped by sediment and down. 21

Photograph 19. (Photo 35) Grass and vegetation encroaching onto the silt fence suggests that the fence failure has been in place long enough to allow the establishment of vegetation. 22

Photograph 20. (Photo 37) This silt fence failure is a lack of toe-in. All runoff in the area and suspended sediment will exit the site beneath the silt fence. Because water pressures can be concentrated by the failed silt fence, increasing flow velocities, the potential for sediment transport through this particular failure is high. 23

Photograph 21. (Photo 44) A gap in the silt fences exposes sediment to migration 23

Photograph 22. (Photo 48) This photograph illustrates failure of both the erosion control blanket and silt fence to protect the culvert from sediment migration. 24

Photograph 23. (Photo 51) This photograph of an approximately 18-inch gap between the edge of construction and the limit of the erosion control blanket illustrates another area for potential

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Photograph 26. Exposed Karst Edwards Limestone in the Vicinity of the Proposed Highway Right-of-Way (April 11, 2014 @ 9:01 am, taken on survey line southeast of Bear Creek by author) 40

Introduction

A The Texas Department of Transportation, Austin District, proposes to construct four miles of high-speed controlled access highway between the southern terminus of Loop 1 (MoPac) and Farm-to-Market Road (FM) 1626. The proposed highway right-of-way crosses portions of the Slaughter Creek, Bear Creek and Little Bear Creek watersheds, as shown on Figure 1. The proposed highway right-of-way is located over the Barton Springs Edwards Aquifer recharge and transitions zones. These zones provide recharge which sustain groundwater flow to springs which are the endemic home of federally-listed endangered species. Sensitive karst features in the vicinity of the proposed project indicate direct connection between the ground surface and the underlying aquifer.

B The Texas Department of Transportation, Austin District, published a Draft Environmental Impact Statement (EIS) for the proposed State Highway 45 Southwest on June 2014. This report reviews the Draft EIS, in terms of its completeness and accuracy regarding potential impacts to of surface water quality, and the quality of water within and discharging from the Barton Springs Edwards Aquifer from the proposed project.

Setting

C The Barton Springs Edwards Aquifer is a karst aquifer lying within the Cretaceous-age Edwards Limestone and associated geologic formations. The Barton Springs segment of the encompassing Edwards Aquifer is bounded on the north by the Colorado River, on the west by the edge of the Edwards formation, on the east by an interface with relatively saline water, and on the south by a shifting groundwater divide, depending on aquifer stage, between Onion Creek and the Blanco River.

D The largest natural discharge from the Barton Springs Edwards Aquifer is the Barton Springs complex, including Parthenia, Eliza, Old Mill, and Upper Barton Springs. Cold Spring, partially submerged on the southeast shore of Lady Bird Lake between MoPac Expressway and the Tom Miller Dam, also discharges from this aquifer.

A

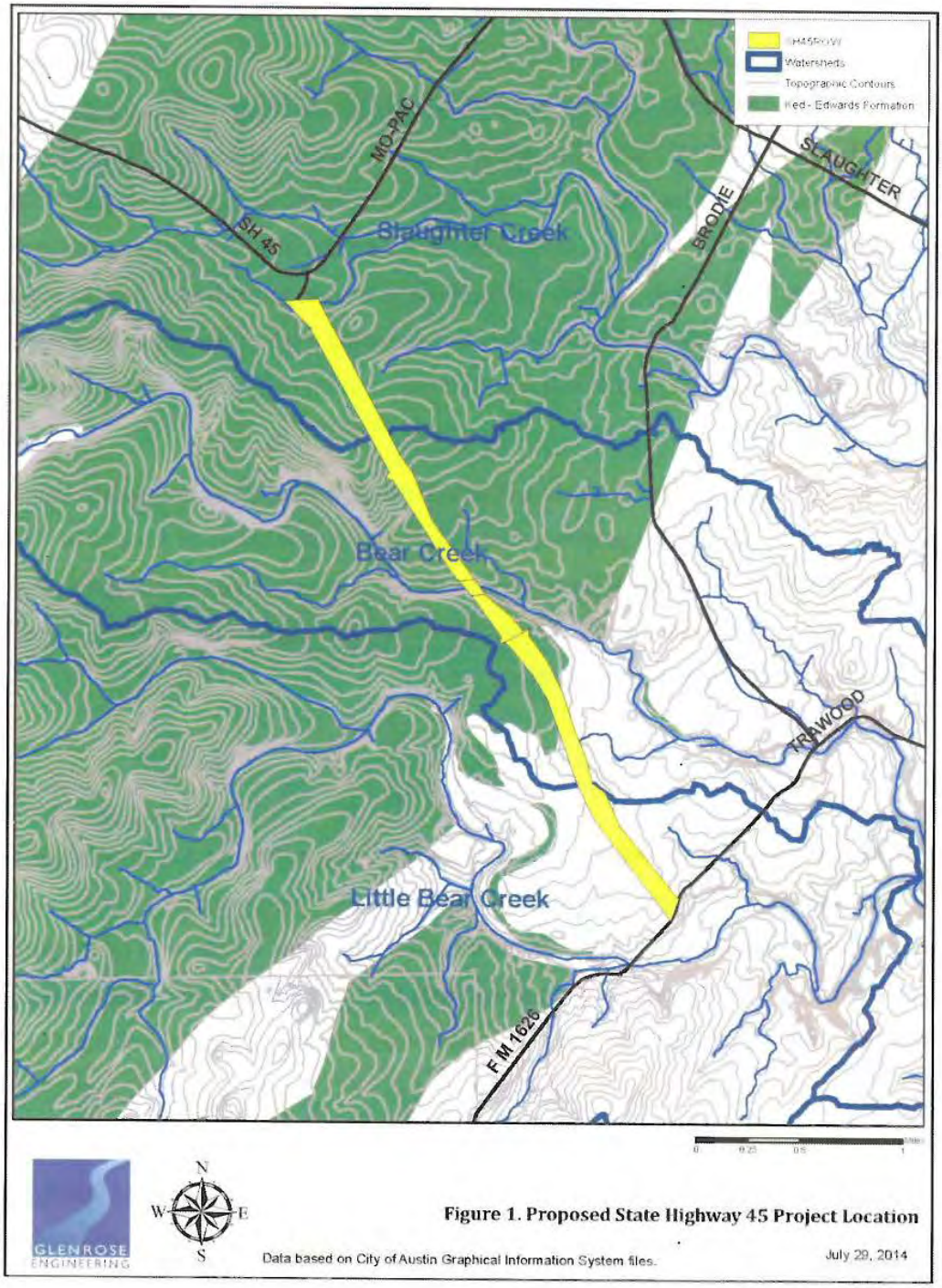


Figure 1. Proposed State Highway 45 Project Location

A

In addition to being a source for natural spring discharges, the Barton Springs Edwards Aquifer is a federally-designated sole-source water supply for about 60,000 people who depend on water from wells. The aquifer and flow from the springs also provides the only known habitat for two federally-listed endangered aquatic salamanders: *Eurycea sosorum* and *Eurycea waterlooensis*. Survival of both of these species depends upon reliable high-quality water from the aquifer through their aquifer and spring habitats.

B

Karst aquifers are relatively vulnerable to contamination, compared to sand and gravel porous media aquifers, for several reasons. Overlying soils are thin and rocky, providing little pollution attenuation as water moves through the vadose zone. These thin soils are expressed in the vicinity of the proposed highway right-of-way, as illustrated by Photograph 1.

Photograph 1. Soils and Exposed Karst Edwards Limestone in the Vicinity of the Proposed Highway Right-of-Way (April 11, 2014, 8:55 am, taken on survey line about 40 feet southeast of Bear Creek by author).

Water in karst aquifers moves through relatively large conduits, compared to water movement through the fine pores and along the extensive surface area of porous media aquifers. These large conduits provide little pollution filtration or absorption. See Photograph 2.

A

Photograph 2. William Russell in Eileen's River in Blowing Sink Cave (taken by Julie Jenkins).

Rapid water movement through the aquifer transports pollution to wells and springs over times as short as a few days. This short timeframe provides little opportunity for biological or chemical changes that could mitigate pollution or spill contaminants in a different type of aquifer.

B

The Barton Springs Edwards Aquifer is also particularly vulnerable to changes in the volume of rainfall recharge. Under natural conditions spring flows from karst aquifers, including Barton Springs Edwards Aquifer, increase quickly in response to rainy conditions and are significantly depleted during drought. Any diminishment in the volume of aquifer recharge is quickly expressed as reductions in spring flow rates.

Draft Environmental Impact Statement Review

A

Given the sensitive environmental setting of the proposed highway and its relationship to the habitat of federally-listed endangered species that depend on the Barton Springs Edwards Aquifer, there are several areas where the Draft EIS fails to adequately consider or represent the threat of both construction and operation of the proposed roadway to the purity and volume of water in that aquifer. Furthermore, where risks are mentioned, they are dismissed without substantive analysis of either the consequences or likelihood of surface or groundwater contamination or diminishment of recharge. There are decades of Central Texas research that provides a basis for quantifying water quality impacts from construction and highway operation. Most of this information is not used in the Draft EIS. Scientific quantification of potential water degradation and its probability of occurrence should be a ***minimum*** standard for evaluating potential environmental impacts. The Draft EIS fails to meet that standard.

B

The sections below describe in detail where the Draft EIS fails to reach a minimum standard of scientifically-based assessment, or fails to represent all of the currently-available science associated with the potential water quality and quantity consequences of the proposed project.

Failure to Estimate Construction-Phase Erosion and Sediment

C

Construction sites are more prone to erosion than either the natural or the developed landscape. Clearing, grubbing, earth moving, grading, excavation, and fill remove or cover naturally stabilized vegetation, trees, roots and soil systems. These processes disrupt native soil microbiology and natural soil structure. During construction, expansive areas of bare and loosened soil are exposed to erosive wind and rain. Although the Draft EIS refers to *"limited soil disturbance"*[1] there are no specific descriptions of staging plans, time limits for phasing, or mapped limits of construction. Without specific construction-phase constraints, erosion potential and associated environmental impacts cannot be accurately estimated or described. Furthermore, the technical requirements of fill and pavement placement and the efficiencies of construction drive projects toward maximizing areas of disturbance.

[1] See Draft EIS page H-41, for example.

A

The proposed site also will be vulnerable to erosion from construction of the proposed highway project because of the relatively long and steep slopes that will be created by proposed fill (as high as 25 above natural grade, see Table1), because of the close proximity of sensitive karst features and recharging streams, and because the thin soil and sparse vegetation of the natural environment provides little downstream protection from sediment migration.

B

The Draft EIS fails to quantify potential erosion from the site, despite the availability of scientific information from which such estimates could be made.[2] One tool for estimating the erosion is the Revised Universal Soil Loss Equation.[3] This tool was used to estimate the erosion potential from the site under existing conditions and during construction.

Table 1. Proposed Fill Height

Station	Pavement Grade Line (ft)	Existing Ground (ft)	Fill Height (ft)	Source
378+00	836.07	814.70	21.37	SH 45SW Schematic Design 3
368+00	830.55	813.86	16.69	SH 45SW Schematic Design 3
317+00	810.94	794.29	16.65	SH 45SW Schematic Design 2
324+00	829.50	809.72	19.78	SH 45SW Schematic Design 2
209+00	712.16	693.45	18.71	SH 45SW Schematic Design 4
221+00	756.82	731.45	25.37	SH 45SW Schematic Design 1

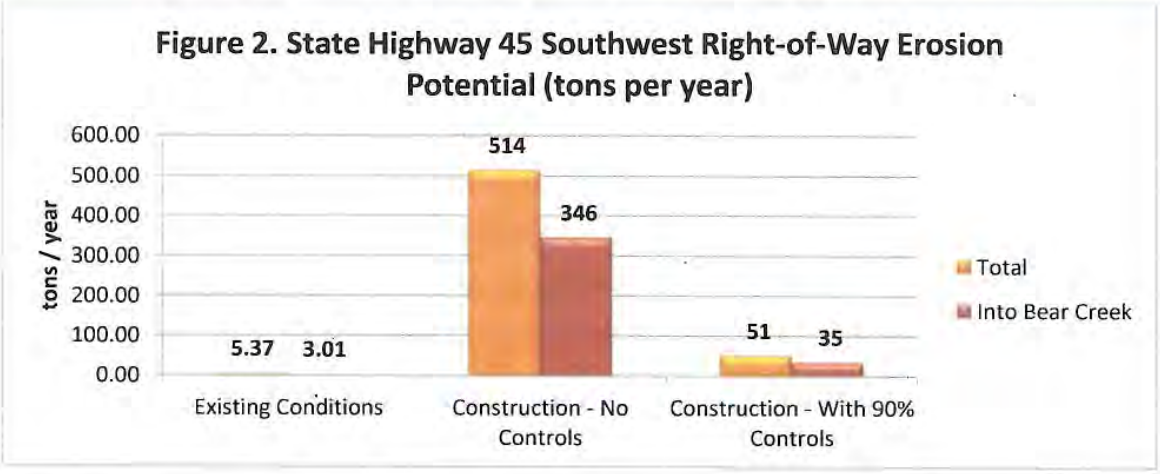
C

The erosion potential estimates, indicated in Figure 2, show a 100-fold increase in the erosion potential for the proposed construction site. This predicted increase is conservative when compared to literature references of approximately 1,000-fold increases in soil erosion from natural conditions to construction sites.[4]

---

[2] See Draft EIS page H-5 and following.
[3] Certified Professional in Erosion and Sediment Control Council, 2007, *CPESC® Exam Review Study Guide.*
[4] Barrett, Michael, Kearney, John, McCoy, Terry, Malina, Joseph F. Jr., Charbeneau, Randall, and Ward, George, 1995, *An Evaluation of the Use and Effectiveness of Temporary Sediment Controls,* Center for Research in Water Resources, Technical Report CRWR 261. Page 1.

A



B

Details regarding these erosion potential calculations are contained in Appendix B. Calculations were made based on available information in the Draft EIS and appropriate assumptions for information that was not provided. Although different assumptions and additional information would produce different estimates, the estimates provided here are generally consistent with a large body of relevant and available scientific information and is an example of an analysis that is significant to the environmental impact assessment of the proposed project but is not included in the report.

Limitations of the Proposed Construction-Phase Erosion and Sediment Controls

C

The Draft EIS suggests numerous construction-phase best management practices (BMPs). It does not, however, establish a numerical storm runoff quality standard for construction-phase controls.[5] Although during a technical meeting,[6] a standard for construction-phase water quality controls that would remove a minimum of 90 percent of total suspended solids was stated, in response to a participant question, the Draft EIS does not support that statement.

Appendix H Section A.2 "Best Management Practices During Construction" describes construction-phase erosion control practices using the future conditional verb form of "should,"

[5] See, for example, Draft EIS pages H-19 through H-25.
[6] July 25, 2104.

"could," or "is recommended," indicating actions that ***might*** take place. Failure to use the future simple verb tense for actions that cannot be influenced ("will") makes it impossible to know which of the menu of options will actually be implemented. Information regarding construction

A phase controls is expository and provides no actual information about what would be done for this particularly project. An assessment of potential impacts requires more than a list of possible, recommended, or even "necessary" actions to achieve a desired level of environmental protection. It requires a description of actual measures to be implemented. Such a list is not provided in the Draft EIS.

As shown in Figure 2 above, however, even if the construction project achieves the stated goal of construction-phase controls to remove 90 percent of total suspended sediment, there would still

B be a 10-fold increase in erosion from about 10,000 pounds per year to 100,000 pounds per year. Potentially significant environmental consequences of this increase in sediment to local karst features, threatened species, to the Barton Springs Edwards Aquifer and to spring flow and habitat are not included in the Draft EIS.

Other construction projects, subject to regulations that require generally the same protocols as those proposed for State Highway 45SW in the Draft EIS, have resulted in off-site sediment migration and contamination of sensitive downstream features. One example is roadway construction for Ranches at Hamilton Pool in May and June 2007 which resulted in significant

C contamination of Hamilton Pool, and four miles of intervening Davis Creek.[7] Another example is sediment contamination of East Lick Creek by roadway and subdivision construction of West Cypress Hills Development in western Travis County.[8] A third example is construction of the Lowes' Home Improvement Center on Brodie Lane over the Barton Springs Edwards Aquifer recharge zone.[9] All of these projects used fuel containment, silt fences, rock berms, slope stabilization, and/or sediment capture basins similar to those proposed by TXDOT for the State Highway 45SW project in the Draft EIS. Despite these measures, significant pollution migrated

[7] Espey Consultants, Inc., 2008, *Hamilton Pool and Receiving Streams, Travis, County with Portion in Hays County: Stream Bed Assessment and Water Quality Evaluation Report*, prepared for Travis County government.
[8] Smith, Amy, 2004, "The Showdown at Lick Creek: As once clear water runs dark, a community defends its natural heart," *Austin Chronicle*, http://www.austinchronicle.com/news/2004-07-02/218425/ accessed August 1, 2014.
[9] Personal knowledge based on field investigation on June 30, 2004.

A

off-site and/or contaminated sensitive downstream water resources. The Draft EIS touts local, state and federal regulations prohibiting pollution as a basis for concluding that such pollution will not occur. Some of the regulations described do not apply to the proposed project. Furthermore, history shows that the existence of regulations alone is insufficient to achieve environmental protection.

Limitations of Construction-Phase Pollution Controls Based Exclusively on Total Suspended Solids Loads.

B

The Draft EIS proposes that both construction-phase and permanent storm runoff treatment and water quality controls will be designed based only on consideration of a single parameter: total suspended solids. An inherent danger of this limited perspective is that sediment control methods focused exclusively on total suspended solids can create significant amounts of additional off-site pollution. An example of this danger is the use of compost for erosion control. Applications of compost-based erosion control for the West Cypress Hills development in the East Lick Creek watershed reduced total suspended solids loads but resulted in as much as a ten-fold increase in downstream nitrogen concentrations (as high as 0.6 mg/L, compared with background locations under the same flow conditions of 0.05.[10]) Elevated nitrogen and other nutrient concentrations produce excessive algae growth and can contribute to more exaggerated swings in water dissolved oxygen concentrations and hypoxia. These conditions are damaging to the ecosystem that supports aquatic life, can impair aesthetic values and may violate stream standards promulgated under the federal Clean Water Act. None of these potential effects are discussed in the Draft EIS.

C

Another problem with the narrow focus on total suspended solids reductions as the single measure of pollution reduction is that the most effective BMPs for nutrient removal, measures like bioretention and biofiltration, are eliminated from further consideration for the proposed highway.[11]

---

[10] Personal knowledge based on sampling of East Lick Creek during base flow conditions in September 2007.
[11] Draft EIS page H-58.

TxDOT Failure to Properly Maintain Construction-Phase Erosion and Sediment Controls on Similar Project

A

Although both the Federal Clean Water Act and the Texas Edwards Rules require permits to prevent construction site erosion and sediment migration, there are numerous and regular failures of these rules to protect water quality. Construction of US Highway 290 West between FM 1826 and Convict Hill Road is similar to the proposed SH 45 Southwest project in that both highways are located upstream of sensitive karst features that recharge the Barton Springs Edwards Aquifer. The photographs below, taken at places indicated on Figure 3, illustrate failed highway construction erosion and sediment control practices from locations where runoff flows toward Dry Fork Sink, a karst feature that was dye-traced to discharge in Barton Springs with a travel time of less than 30 hours.[12]

B

Both construction projects have the potential to create erosion and allow sediment migration into the karst aquifer that would negatively affect the endangered species salamanders (*Eurycea sosorum* and *Eurycea waterlooensis*) that inhabit the aquifer and spring environment.

The proposed SH 45 Southwest project is also similar to the U S Highway 290 West in that both are subject to water pollution prevention requirements and construction-phase regulations promulgated by the Texas Commission on Environmental Quality (TCEQ) based on delegated authority to implement the federal Clean Water Act, and on additional regulations promulgated based on state law to protect the Edwards Aquifer.

---

[12] Hauwert, Nico, Johns, David, and Aley, Thomas, 1998, *Preliminary Report on Groundwater Tracing Studies within the Barton Creek and Williamson Creek Watersheds, Barton Springs/Edwards Aquifer*. Barton Springs Edwards Aquifer Conservation District and the City of Austin Watershed Protection Department.

A

Figure 3. Photographed Construction-Phase Failures Upstream of Dry Fork Cave Sink

Note. Base aerial photograph predates construction project.

July 25, 2014

A

Given that these projects are subject to similar regulations and represent potential similar impacts to sensitive environmental resources and habitat, construction-phase erosion and sediment control failures indicated by the following photographs are indicative of potential and likely failures in constructing the proposed highway. All of the photographs below were taken by the author on July 18, 2014 between 3:14 pm and 4: 15 pm using a Nikon D100 camera and natural light.

B

Based on the weather station at Bergstrom Airport in Austin, Texas, 0.88 inches of rain fell on July 17 and 0.25 inches fell on July 18, 2014.[13] Conditions during the field investigation were wet, with standing water present in low-lying areas. Despite the occurrence of a significant rainfall the previous night and morning, and the imminent threat of additional rain, there was no construction staff on the site for timely inspection and repair of controls, as is required by the Edwards Rules.[14]

C

Note that each of the photographs in this section have two numbers. The first photograph number is a sequential number for the purposes of this report; for example: Photograph 3. The second number is the sequential number on the day the photo was taken and corresponds to the number on Figure 3. For example: (Photo 1).

---

[13] http://www.wunderground.com/history/airport/KAUS/2014/7/21/MonthlyHistory.html#calendar, accessed on July 19, 2014.
[14] 30TAC §213.24(5)(G).

Date: 7/18/2014
Time: 15:14
Location:
30.229061,
-97.888479
Direction: north

Photograph 3. (Photo 1) Sediment on both sides of the silt fence demonstrating failure of the silt fence to contain sediment

A

Date: 7/18/2014
Time: 15:14
Location:
30.229061,
-97.888479
Direction: east

Photograph 4. (Photo 2) Silt and silty water evident in the culvert downstream from the silt fence in Photo 1.

Date: 7/18/2014

Time: 15:14

Location:

30.229061,

-97.888479

Direction: south

Photograph 5. (Photo 3) This, taken from a location near Photos 1 and 2, shows evidence of the sediment, including organic material and fine silt exposed and mobilized by highway.

A

Date: 7/18/2014

Time: 15:14

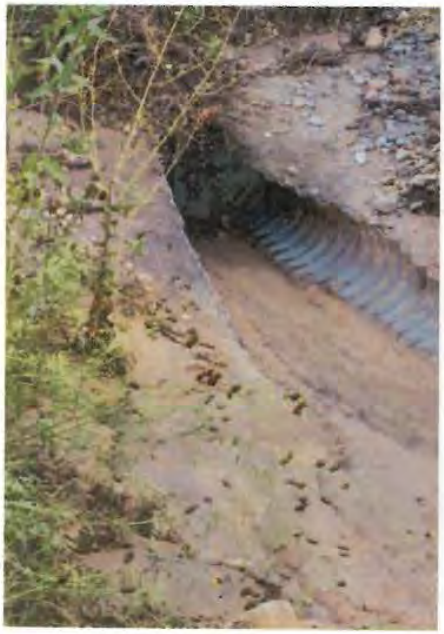
Location:

30.229084,

-97.888458

Direction: north

Photograph 6. (Photo 4) A culvert inlet beneath FM 1626 showing significant amounts of silt mobilized into the mouth of the culvert.



Date: 7/18/2014

Time: 15:19

Location:

30.229099,

-97.888166

Direction: west

A

Photograph 7. (Photo 17) Example of fine sediment exiting from the culvert, the inlet of which is depicted in Photo 4.

Date: 7/18/2014

Time: 15:16

Location:

30.228966,

-97.888456

Direction: south

Photograph 8. (Photo 12) Taken from near the intersection of US Highway 290 and FM 1826, the extensive slopes which are exposed by the construction process.

Date: 7/18/2014
Time: 15:18
Location:
30.229009,
-97.888192
Direction: north

Photograph 9. (Photo 13) A silt fence located behind the stockpile of earth on the right. This fence is located perpendicular to the topography slope. It stops short of the toe of the slope. Mobilized sediment would flow around the silt fence and toward a small drainage downstream.

A

Date: 7/18/2014
Time: 15:19
Location:
30.229074,
-97.888161
Direction: south

Photograph 10. (Photo 19) Taken from downslope of Photo 13, this shows the fine silt that has been mobilized along the slope and below the stockpile.

Date: 7/18/2014

Time: 15:34

Location:

30.228821,

-97.885677

Direction: east

Photograph 11. (Photo 21) This photograph illustrates a silt fence gap that allows sediment to migrate beyond the limits set by the fence.

A

Date: 7/18/2014

Time: 15:36

Location:

30.228642,

-97.885930

Direction: north

Photograph 12. (Photo 22) This photograph illustrates the fine sediment (surrounding and beneath the backhoe) that is generated and released by the highway construction process. This fine sediment is particularly mobile in both the surface environment and through the aquifer.

Date: 7/18/2014
Time: 15:37
Location:
30.228642,
-97.885930
Direction: north

Photograph 13. (Photo 24) This photograph, like the one preceding, illustrates the significant quantities of fine clay sediment that is generated and released by the highway construction process.

A

Date: 7/18/2014
Time: 15:38
Location:
30.228850,
-97.885179
Direction: east

Photograph 14. (Photo 26) The long slope illustrated in this photograph is particularly conducive to erosion. Fine sediment at the toe is evident here.

A

Date: 7/18/2014

Time: 15:39

Location:

30.228819,

-97.885018

Direction: south

Photograph 15. (Photo 27) This photograph was taken of a small stream downstream from a rock berm at the toe of the slope illustrated in Photo 26. The brown color of the water and channel bottom is evidence of the fine construction silt illustrated in preceding photographs migrating beyond the construction phase controls at this site.

A

Date: 7/18/2014

Time: 15:40

Location:

30.228819,

-97.885018

Direction: west

Photograph 16. (Photo 29) The clay-lined depression downstream from the toe of the rock berm illustrates both the failure of the berm to prevent sediment migration beyond the berm illustrates both the failure of the berm to prevent sediment migration beyond the berm, and the erosive power of downstream flow to generate sediment beyond the limits of construction.

Date: 7/18/2014

Time: 15:41

Location:

30.228819,

-97.885018

Direction: east

Photograph 17. (Photo 30) Another area of sediment-covered ground downstream from project erosion/sediment controls, likely generated from highway construction.

A

Date: 7/18/2014

Time: 15:43

Location:

30.22870 -97.88473

Direction: south

Photograph 18. (Photo 34) Photograph illustrates a silt fence that is overtopped by sediment and down.

A

Date: 7/18/2014

Time: 15:44

Location:

30.22870 -97.88473

Direction: east

Photograph 19. (Photo 35) Grass and vegetation encroaching onto the silt fence suggests that the fence failure has been in place long enough to allow the establishment of vegetation.

Date: 7/18/2014

Time: 15:45

Location:

30.22870 -97.88473

Direction: south

Photograph 20. (Photo 37) This silt fence failure is a lack of toe-in. All runoff in the area and suspended sediment will exit the site beneath the silt fence. Because water pressures can be concentrated by the failed silt fence, increasing flow velocities, the potential for sediment transport through this particular failure is high.

A

Date: 7/18/2014

Time: 15:51

Location:

30.22903 -97.88250

Direction: north

Photograph 21. (Photo 44) A gap in the silt fences exposes sediment to migration.

A

Date: 7/18/2014

Time: 15:54

Location:

30.22903 -97.88250

Direction: east

Photograph 22. (Photo 48) This photograph illustrates failure of both the erosion control blanket and silt fence to protect the culvert from sediment migration.

A

Date: 7/18/2014

Time: 15:58

Location:

30.23003 -97.87987

Direction: south

Photograph 23. (Photo 51) This photograph of an approximately 18-inch gap between the edge of construction and the limit of the erosion control blanket illustrates another area for potential sediment migration. Traces across the bare soil surface indicate sediment has migrated to the left of the area of this photograph.

A

Date: 7/18/2014

Time: 15:58

Location:

30.23003 -97.87987

Direction: unknown

Photograph 24. (Photo 52) Another location where sediment on both sides of a silt fence demonstrate lack sediment of containment.

A

Date: 7/18/2014

Time: 15:59

Location:

30.23003 -97.87987

Direction: south

Photograph 25. (Photo 53) Another location where sediment on both sides of a silt fence demonstrates lack sediment of containment. Sediment has migrated into the concrete culvert despite the presence of the redundant silt fence and rock berm controls.

Failure to Consider the Effects of Construction-Phase Erosion and Sediment in the Barton Springs Edwards Aquifer

B

The Draft EIS fails to consider the effects of increases in sediment loads from the construction site to discharges in the Barton Springs Edwards Aquifer and its spring outlets. Scientific evidence exists of surface sediment migration through the aquifer to the spring discharge. The presence of organic material and colored fibers associated with sediment samples from the

Continued on following

Continued from previous page

Barton Springs provides evidence of a surface sediment source.[15] The coincidence of peak total suspended solids concentrations with minimum concentrations of calcium and magnesium 14 to 15 hours after rainfall also indicates a surface origin for suspended sediment. A pronounced decrease in total suspended solids concentrations in spring water long before any decrease in spring flow rates following a rain event further indicates that the source of sediment in the spring water discharge is surface and creek runoff, rather than flow-induced internal aquifer erosion. Studies of Barton Springs discharge indicate that sediment concentrations in spring flow may increase in response to larger amounts of sediment on the recharge landscape and streams beds.[16]

A The Draft EIS fails to consider the potential for increased sedimentation from functioning construction-phase or permanent storm runoff treatment systems, or from their failure, on water quality and endangered species habitat in the Barton Springs Edwards Aquifer and the its springs. It also fails to account for degradation from other associated and related pollutants.

B Any evaluation of contaminant transport from the proposed highway during the construction and post-construction period through the karst aquifer to spring discharge locations must evaluate both water-phase and sediment-phase transport. Sediment-phase transport must be characterized by organic carbon content, grain-size distribution, particulate density, and mineral composition. By failing to accomplish such an evaluation, the Draft EIS fails to evaluate the impact of the proposed project on the quality of water in Barton Springs pool and the habitat springs.

Failure to Provide Adequate Standards for Permanent Storm Runoff Treatment

Failure to Characterize Highway Runoff Pollution

C An adequate characterization of potential environmental impacts from the proposed project must include a full characterization of pollutants contained in highway runoff, in terms of both concentrations and loads, since both measures affect the quality of the downstream environment.

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[15] Mahler, Barbara, and Lynch, Leo, 1999, "Muddy waters: temporal variation in sediment discharging from a karst spring," in *Journal of Hydrology*. 214: 165–178.
[16] Mahler, Barbara, and Lynch, Leo, 1999, "Muddy waters: temporal variation in sediment discharging from a karst spring," in *Journal of Hydrology*. 214: 165–178.

A

Although the Draft EIS attempts to argue a lack of any downstream impact based on construction-phase and permanent storm runoff treatment systems, the pollution reduction standard is limited and there is no analysis to support the conclusion of no downstream impact. Furthermore, as demonstrated above, the proposed runoff treatment and sediment control systems are limited in terms of both their capture volume and their reliability under real-world maintenance regimes.

B

Highway runoff contains numerous pollutants that would degrade surface water tributary to Slaughter Creek, Bear Creek, and Little Bear Creek, subsurface water in local karst features, and water recharging the Barton Springs Edwards Aquifer. Despite a significant body of literature characterizing highway runoff[17], none of this relevant scientific information is presented in the Draft EIS.[18]

Failure to Establish Control Design Standards for the Range of Highway Pollution

C

The Draft EIS states that an 80 percent total suspended solids removal standard represents the minimum requirement under 30 TAC 213, but that additional water quality and quantity is

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[17]Barrett, Michael, Kearney, John, McCoy, Terry, Malina, Joseph F. Jr., Charbeneau, Randall, and Ward, George, 1995, *An Evaluation of the Use and Effectiveness of Temporary Sediment Controls,* Center for Research in Water Resources, Technical Report CRWR 261;
Barrett, Michael, Kearfott, Pam, and Malina, Joseph F. Jr., 2006, "Stormwater Quality Benefits of a Porous Friction Course and Its Effect on Pollutant Removal by Roadside Shoulders," *Water Environment Research*, 78, 2177;
Berbee, Rob, Rijs, Gerard, de Brouwer, René, van Velzen, Lood, 1999, "Characterization and Treatment of Runoff from Highways in the Netherlands Paved with Impervious and Pervious Asphalt," *Water Environment Research*, 71, 183;
Barrett, Michael, Malina, Joseph, and Charbeneau, Randall, 1995, *Water quality and Quantity Impacts of Highway Construction and Operation: Summary and Conclusions, Center for Research in Water Resources,* Technical Report CRWR 266;
Yousef, Yousef, Wanielista, Martin, Harper, Harvey, and Vitred-Jacobsen, T.H., 1986, *Effectiveness of Retention/Detention Ponds for Control of Contaminants in Highway Runoff*, State of Florida Department of Transportation, FL/DOT/BMR-86-307;
Barrett, Michael, Malina, Joseph, Charbeneau, Randall, and Ward, George, 1995, *Characterization of Highway Runoff in the Austin Area, Texas, Center for Research in Water Resources*, Technical Report CRWR 266;
Barrett, Michael, Zuber, Robert, Collins, E.R., Malina, Joseph F. Jr., Charbeneau, Randall, and Ward, George, 1995, *A Review and Evaluation of Literature Pertaining to the Quantity and Control of Pollution from Highway Runoff and Construction,* Center for Research in Water Resources, Technical Report CRWR 239; and
Young, Kenneth, Stein, Stuart, Cole, Pamela, Kammer, Traci, Graziano, Frank, and Bank, Fred, 1998, *Evaluation and Management of Highway Runoff Water Quality,* Federal Highway Administration, FHWA-PD-96-032.
[18] See, for example, pages H-5 and H-6.

Continued from previous page

desired.[19] The document provides, however, no clear and consistent statement regarding the pollution reduction standard for the proposed project. Instead of clear and consistent statements regarding pollution reduction standards, the document provides several contradictory statements:

A *"The construction phase goal of erosion minimization and offsite sedimentation prevention..."* [20] Note, however, that "offsite sedimentation prevention," or a design goal of 100 percent sediment reduction under all weather conditions is not technically achievable.

B *"Basins* [on-site sediment retention] *would be sized to capture a minimum two-inch rainfall event."* The proposed basin capture volume fails to capture the recommended 3.4 inches for a 2-year, 24-hour storm in Travis County. [21]

C *"Removal for SH 45SW would total at least 90 percent of post-construction TSS over the Edwards Aquifer Recharge Zone."*[22]

D *"Ponds* [permanent storm runoff treatment] *would be sized to capture a minimum two-inch rainfall event."* This proposed basin size fails to capture the recommended 3.4 inches for a 2-year, 24-hour storm in Travis County. [23]

E *"Integrated Pest Management (IPM) practices would be employed to reduce the need for pesticide application along the state-owned ROW."*[24] There is no discussion of the potential effects of pesticide or herbicide application allowed by IPM and/or the TxDOT vegetation guidance manual on threatened or endangered species.

F *"Improperly functioning BMPs would be repaired or retrofitted to restore their intended function as needed"*[25]. BMPs require significant maintenance to achieve their design functionality. Regular and frequent maintenance is particularly important for permeable friction

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[19] Draft EIS page H-79.
[20] Draft EIS page H-19, repeated on subsequent pages.
[21] Barrett, Michael, 2005, *Complying with the Edwards Aquifer Rules; Technical Guidance on Best Management Practices*, Texas Commission on Environmental Quality RG-348 (revised). Table 1-6, page 1-106.
[22] Draft EIS page H-35.
[23] Barrett, Michael, 2005, *Complying with the Edwards Aquifer Rules; Technical Guidance on Best Management Practices*, Texas Commission on Environmental Quality RG-348 (revised).
[24] Draft EIS page H-39.
[25] Draft EIS page H-39.

Continued from previous page

course, and water quality ponds proposed for possible permanent water quality measures. Because this statement does not include a commitment to inspect, maintain, and repair malfunctioning BMPs within a specified time frame, the Draft EIS fails to provide information from which the reliability of BMPs to protect the downstream environment can be assessed. Reliability, and the associated probability of failure, is an essential element to assess potential environmental impacts from the proposed project.

A

"The potential impacts to water quality and aquatic resources that may result from construction and operation of the proposed project have been quantified based on the use of specific BMPs which are proposed to avoid, reduce, or compensate for these impacts."[26] There is, however, no quantification of potential water quality or aquatic resource impacts included in the Draft EIS, other than estimates of total suspended solids loads and concentrations. While there are lists of BMP types, and a map showing the location of several water quality ponds, there is no designation of specific BMP types, their locations, sizes, contributing areas, or impervious area within the contributing area. All of this information, not included in the Draft EIS, is the ***minimum*** amount of information necessary to quantify potential impacts that may result from construction and operation of the proposed project. That fact that the Draft EIS states that such quantification has occurred, without the presenting results for the range of pollutants present in highway runoff, is unacceptable.

B

"Staged construction, limited soil disturbance, and the preservation of natural vegetation would minimize erosion and decrease the likelihood of sediment discharges."[27] *"Decrease the likelihood of sediment discharges"* is less protective than *"offsite sedimentation prevention"* described on page H-19 and repeated on subsequent pages.

C

"Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable." (page H-41) *"Minimized to the greatest extent practicable"* is less

Continued on following page

[26] Draft EIS page H-41.
[27] Draft EIS page H-41.

Continued from previous page

protective than *"offsite sedimentation prevention"* described on page H-19 and repeated on subsequent pages.

A Without a clear statement of the pollution reduction standard, it is not possible to assess the potential environmental consequences and water quality degradation that would occur.

Failure to Consider the Potential for Significant Water Degradation Associated with Methods Proposed to Limit Total Suspended Solids

B The design basis for storm runoff treatment proposed in the Draft EIS is based exclusively on achieving a target removal efficiency for suspended solids. Total suspended solids fails, however, to represent the range of pollutants found in highway runoff. Furthermore, because removal efficiencies are higher for total suspended solids than for other pollutants, designs based exclusively on total suspended solids removal will neglect removal of more intractable pollutants.

C The proposed removal efficiency, expressed as a percentage of the increase over ***existing*** total suspended solids loads, also fails to address cumulative water quality degradation from existing impervious areas. By stating that total suspended solids loads after the proposed highway construction will be lower than existing loads, the Draft EIS has neglected the pollutant loads from the existing highway construction within the review area.

D The six bar charts on Figure 4 illustrate increases in pollutants for the proposed highway when compared to natural conditions with no constructed impervious area. Loads in Figure 4 for total suspended solids are equivalent (allowing for rounding errors) to the data in Table 5.1-3[28] except that existing loads for the recharge zone are 23,722 pound per year, rather than 9,702 pound per year as expressed in the Draft EIS table. The value presented in this report is consistent with methods described by TCEQ and with all of the other data for the Recharge Zone in the same table. The Draft EIS value of 9,702 is assumed to be a calculation error.

E Pollutant removal efficiencies for the bar charts on Figure 4 were based on the ***highest*** pollutant removal efficiencies reported for permeable friction course treatment in three papers by the

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[28] Draft EIS page H-45.

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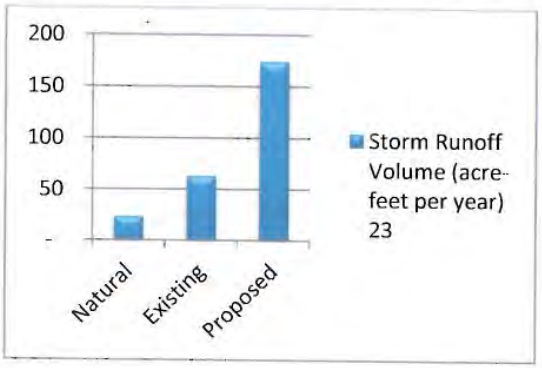
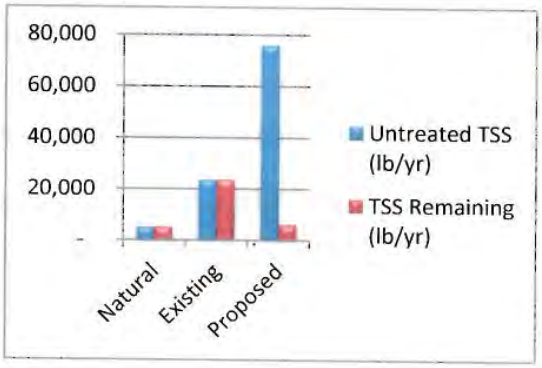
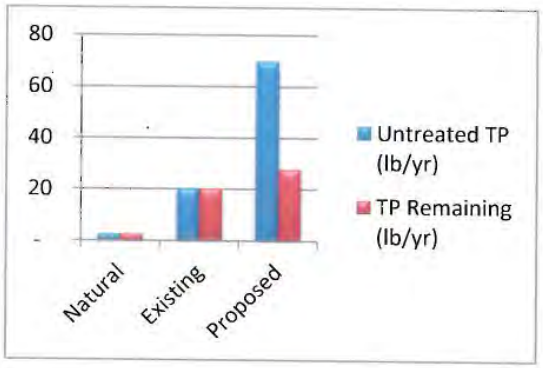
Center for Research in Water Resources at the University of Texas at Austin. See Appendix A. If the mean or a lower pollutant removal efficiency had been used, the estimates of pollution loads from the site for nitrogen, phosphorous, zinc, and chemical oxygen demand would be higher. Each of these parameters is correlated with contamination of aquifer water quality and each represents a potential threat to groundwater and spring flow quality, and habitat.

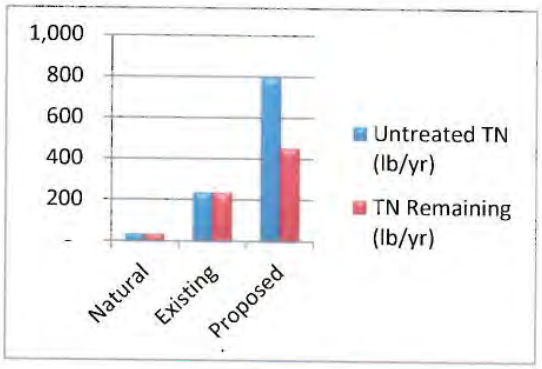
A Designing construction-phase and permanent rainfall runoff controls based exclusively on total suspend solids will lead to significantly excessive concentrations and loads of nutrient nitrogen in the discharges.

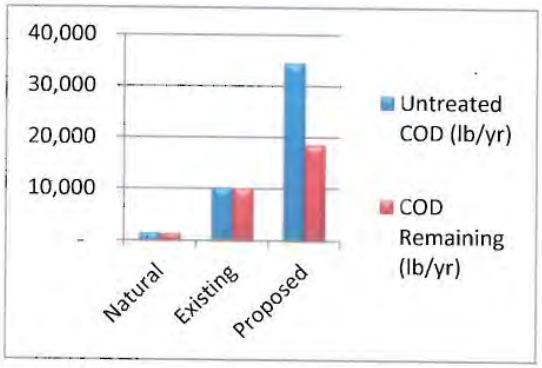
Figure 4. Changes in Storm Runoff Volume and Pollutant Loads from Proposed State Highway 45 Southwest Roadway over the Recharge Zone [29]

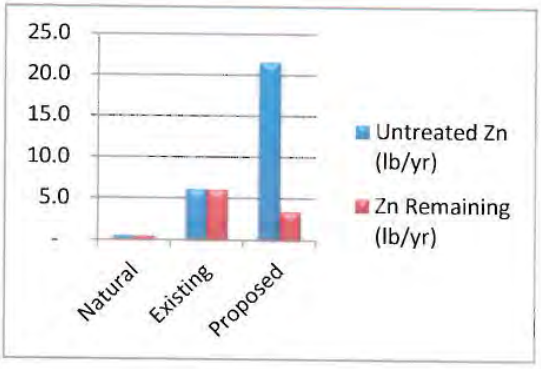












A

[29] Data based on pervious and impervious areas in Draft EIS Table 5.1-3, page H-45.

Inadequate Consideration of the Limitations of PFC as a Runoff Treatment System

The Draft EIS describes the use of low impact development (LID) as an innovative land use and engineering design approach that considers hydrologic source control and runoff reduction. Permeable friction course (PFC) is proposed as such a strategy.[30] Low impact design, however, focuses on a hydrologic analysis of the following design elements:[31]

A

- Minimizing increases in the runoff curve number, CN, used to predict direct runoff from rainfall;
- Maintaining the pre-development time of concentration to control increases in peak runoff by lengthening flow paths;
- Providing retention storage; and
- Providing additional detention storage.

B

Given the limited storage capacity of the proposed permeable friction course, however, its affect on any of these parameters will be limited. The Draft EIS fails to provide data on the effects of permeable friction course on any of these elements that are the focus of LID design.

C

Scientific literature indicates that aggressive maintenance with specially-designed vehicles for pavement cleaning is required to maintain the water quality benefits of the permeable friction course.[32] Without this maintenance, the water quality benefits of the permeable friction course are unlikely to be maintained over the life of the proposed highway. Even with aggressive maintenance, there is no certainty that the pollution reduction performance of permeable friction course paving will be maintained.[33] The Draft EIS fails to acknowledge the need for maintenance, or make any commitment to long term maintenance to achieve the claimed storm runoff treatment values. Without these commitments the proposed highway is unlikely to achieve the assumed pollution reduction over the life of the project and the environmental impacts will be greater than those stated in the Draft EIS.

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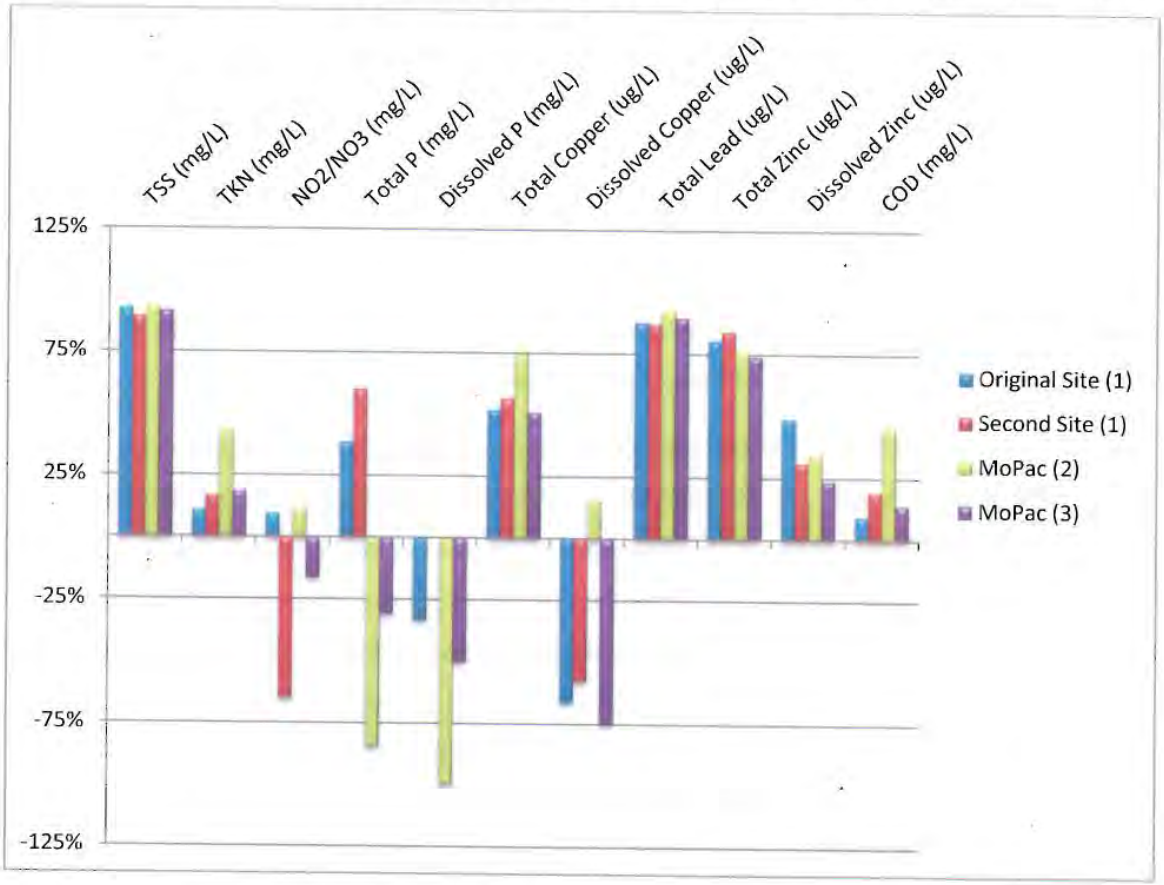
[30] Draft EIS page H-79.
[31] Prince George's County, Maryland Department of Environmental Resources, 1997, *Low-Impact Development Design Manual*. 2-5.
[32] Barrett, Kearfott, and Malina, 2006.
[33] Berbee, Rijs, de Brouwer, and van Velzen, 1999.

A

A literature review of research of permeable friction course pavement indicates that it is consistently most effective for total suspended solids removal. It is less effective for other pollutants and several results indicate that pollutant event mean concentrations of nutrients and dissolved copper can increase compared to concentrations in runoff from conventional asphalt. These differences in reductions for different pollutants are shown on Figure 5.

B

Figure 5. Mean Event Mean Stormwater Concentration Reductions for Pollutants from Permeable Friction Course Pavement Compared to Conventional Asphalt



C

By focusing on total suspended solids as the sole measure of runoff treatment, and by indicating that total suspended solids in storm runoff on project completion will be lower than existing conditions, the Draft EIS fails to characterize increases in other pollutants that will result from the proposed project. The result is that the Draft EIS is misleading, in terms of the impacts to runoff quality from the proposed project.

A

The reduction in effectiveness of storm runoff treatment systems subsequent to permeable friction course is well-documented. Studies of vegetated filter strips,[34] settling basins and sand filtration[35] for runoff from pervious friction courses found no significant decrease in pollutant concentrations from subsequent treatment. Since a higher fraction of copper and zinc in highway runoff from pervious asphalt is present in the soluble phase, removal efficiencies based on treatment of total suspended solids alone will overestimate treatment effectiveness for the proposed highway runoff

Overestimate of the Efficiency of a Series of BMPs

B

The Draft EIS proposes to use the following equation to determine the efficiency of a series of BMPs for the proposed project:[36]

$E_{tot} = [1 - (1-E_1)(1-0.65E_2)(1-0.25E_3)] \times 100$

E_{tot} = the total combined pollutant removal efficiency

E_1 = the efficiency of the first control (decimal fraction)

E_2 = the efficiency of the second control (decimal fraction)

E_3= the efficiency of the third control (decimal fraction)

C

There are several reasons why using percent removal to estimate the effectiveness of water quality controls leads to inaccurate projections of downstream water quality. One reason is that the percent removal of a BMP is strongly dependent on the quality and character of influent water. Furthermore, environmental consequences of the proposed project do not depend on high pollutant removal efficiencies, but upon high water quality. Failure to characterize the quality of water from and downstream of the project during the both the construction and operational phases provides no basis for evaluating the environmental impact of the proposed project.

D

The significant ten-fold increase in sediment loads for a system that achieved a 90 percent reduction in construction-phase sediment (see Figure 2) illustrates the limitations and potential

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[34] Barrett, Kearfott, and Malina, October 2006.
[35] Berbee, Rijs, de Brouwer, and van Velzen, 1999.
[36] Draft EIS page H-65.

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environmental degradation associated with the water quality control standard based exclusively on percentage reduction in pollutant loads. BMPs with high percent removal may have unacceptable high pollutant concentrations in effluent, which leads to a false determination that BMPs are performing adequately when in fact they are not. Effluent pollutant loads are an essential design standard for water quality protection. The Draft EIS fails to provide either a pollutant load standard, or a specific description of storm runoff treatment from which a load estimate could be calculated. Such pollutant load calculations are well within the current state-of-the art for engineering practice in Central Texas and are used routinely in project design.

A Another reason that the proposed equation to estimate BMP efficiency fails to adequately represent BMP performance is that it fails to recognize irreducible concentrations. Particularly for the proposed permeable friction course technology, there are several research articles that report no additional pollution reduction for runoff from the friction course from subsequent BMPs.[37]

B An adequate assessment and standard for storm runoff treatment considers these factors:[38]

- Runoff volume reductions;
- Fraction of runoff treated compared to the volume bypassed;
- The distribution of effluent pollutant concentrations; and
- Effectiveness of the BMP to reduce peak runoff rates.

Failure to Account for Increases in Pollutants and Total Suspended Solids from Downstream Erosion

C BMP pollutant reduction efficiencies proposed in the Draft EIS also fail to account for increases in erosion and sedimentation downstream from runoff controls caused by increases in impervious area. Channel cross-sectional area enlarges in response to impervious area increases to

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[37] See, for example, Barrett, October 2006.
[38] International Stormwater BMP Database, "Frequently Asked Questions: Why does the International Stormwater BMP Database Project omit percent removal as a measure of BMP performance?", www.bmpdatabase.org, accessed July 27, 2014.

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accommodate increases in flow magnitude and frequency associated with small rainfall events.[39] Downstream channel erosion accounts for up to 90 percent of the total suspended solids load in urban streams.[40] The Draft EIS does not describe or quantify these pollutant environmental impacts from the proposed project. Nor does it propose rainfall or runoff infiltration, energy dissipation, and/or storm runoff treatment or management systems design to mitigate the environmental consequences of downstream erosion.

Failure to Account for Decreases in the Quantity of Aquifer Recharge

Flow rates through the spring outlets in the Barton Springs complex depend upon rates of recharge. Karst aquifers such as the Barton Springs Edwards Aquifer, are recharged by a combination of flow from upstream areas and recharge from rainfall onto the karst landscape. The proposed project will affect both of these. Recharge volumes and the proportions of water from these sources depend on several factors: precipitation, evaporation, land surface permeability, plant transpiration, topography, and the presence of karst features.

The proposed highway construction may decrease the quantity of aquifer recharge by:

A

- conversion of permeable soils and karst rock outcrop into impervious highway surfaces;
- compaction of adjacent soils and a reduction of natural infiltration rates;
- covering karst rock outcrop (see Photograph 3) with water-absorbing fill;
- constructing uniform land grades and storm drain systems that reduce natural micro catchment areas;
- diverting rainfall runoff away from karst features;
- plugging potential karst recharge features; and
- inducing additional evaporation by detaining rainfall in water quality ponds.

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[39] Raymond Chan & Associates, Inc., *Technical Procedures for the Watershed Erosion Assessments,* for the City of Austin Drainage Utility Department, September 1997.
[40] Barrett, Michael. *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices*, Texas Commission on Environmental Quality RG-348 (revised), July 2005, pages 3-103.

A

Photograph 26. Exposed Karst Edwards Limestone in the Vicinity of the Proposed Highway Right-of-Way (April 11, 2014 @ 9:01 am, taken on survey line southeast of Bear Creek by author).

B

Although storm runoff rates are predicted to increase due to the additional impervious area, because of the limits in recharge feature capacity, storm runoff increases do not translate into additional aquifer recharge. Sustained base flow between storm runoff events contributes significantly to aquifer recharge. The Draft EIS fails to account for differences in aquifer recharge from the proposed project and the subsequent consequences of reduced aquifer water on pumping well drawdown and spring flow.

In recent measurements within the Flint Ridge Cave surface drainage area, beneath and adjacent to the proposed highway, autogenic aquifer recharge (recharged derived from rainfall over the recharge zone) ranged from 30 to 45 percent.[41] This aquifer recharge is threatened by the proposed project.

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[41] Hauwert, N.M. and Sharp, J.M. June 2014. "Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration." *Journal of Water Resource and Protection*, 6, 869-879. http://dx.doi.org/10.4236/jwarp.2014.69081, accessed July 23, 2014.

Failure to Prevent Degradation of Flint Ridge Cave and Other Karst Features

The Draft EIS proposes to protect the surface drainage area of Flint Ridge Cave by constructing a bentonite clay liner upgradient and adjacent to a storm flow diversion berm. The combined thickness of the compacted clay and topsoil to support vegetation would be six inches.[42] The purpose of the clay liner is to prevent possible infiltration and divert potentially spilled material. This clay liner proposal, however, fails to consider the following relevant scientific facts:

A

- Although the thickness of the proposed liner is not stated in the Draft EIS, the description of its placement suggests that the total thickness cannot be more than 3 to4 inches. This thickness is inadequate to achieve an adequate seal. TCEQ recommends, for example, a minimum thickness of 12 inches.[43]
- Topsoil over the liner is proposed to support vegetation. Plant roots will quickly and easily penetrate the proposed clay liner thickness, allowing runoff, highway pollution, and spilled material to migrate into the subsurface.
- The permeability of clay is significantly increased when in contact with petroleum chemicals. Under spilled fuel conditions the proposed liner will be even less effective than otherwise to protect the underlying karst environment and Flint Ridge Cave.

Conclusion

B

For the reasons stated above, the Draft EIS for State Highway 45 SW fails to properly account for potential water quality degradation and water quantity reductions from the proposed highway construction and operation. Given the importance of water quality and quantity to the streams, creeks, aquifer, and endangered and listed species habitat, as well as to the residents and businesses of the potentially affected area, such an omission constitutes a failure to adequately characterize, describe, and mitigate all of the potential environmental consequences of the proposed project.

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[42] Draft EIS Page H-26.
[43] Barrett, Michael. *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices*, Texas Commission on Environmental Quality RG-348 (revised), July 2005, page 3-38.

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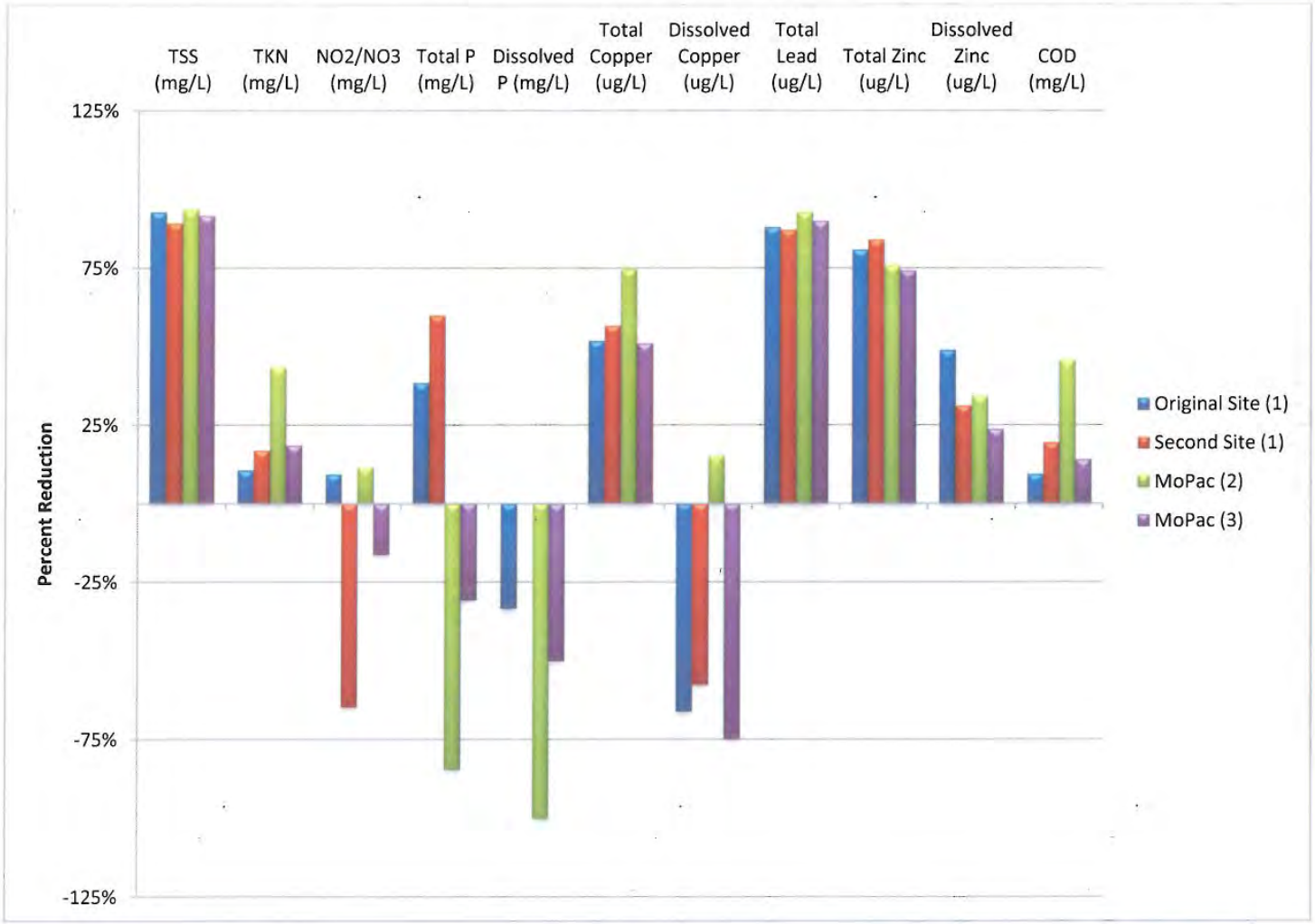
Appendix A. Monitoring Data for Permeable Friction Pavement

Table A-1. Mean Event Mean Concentrations for Pollutants from Conventional Asphalt and Permeable Friction Course (PFC) Pavement

	Original Site (1)	Original Site (1)	Original Site (1)	Second Site (1)	Second Site (1)	Second Site (1)	MoPac (2)	MoPac (2)	MoPac (2)	MoPac (3)	MoPac (3)	MoPac (3)
Constituent	Conventional Asphalt	PFC	Reduction (%)	Conventional Asphalt	PFC	Reduction (%)	Conventional Asphalt	PFC	Reduction (%)	Conventional Asphalt	PFC	Reduction (%)
TSS (mg/L)	117	8.4	93%	159	17	89%	117.8	7.6	94%	117.8	9.7	92%
TKN (mg/L)	1.13	1.01	11%	1.12	0.93	17%	1.13	0.64	43%	1.13	0.92	19%
NO2/NO3 (mg/L)	0.43	0.39	9%	0.17	0.28	-65%	0.43	0.38	12%	0.43	0.5	-16%
Total P (mg/L)	0.13	0.08	38%	0.15	0.06	60%	0.13	0.24	-85%	0.13	0.17	-31%
Dissolved P (mg/L)	0.06	0.08	-33%	0.04	0.04	0%	0.06	0.12	-100%	0.06	0.09	-50%
Total Copper (ug/L)	27	13	52%	30	13	57%	26.8	6.8	75%	26.8	13.1	51%
Dissolved Copper (ug/L)	5.9	9.8	-66%	5.9	9.3	-58%	5.9	5	15%	5.9	10.3	-75%
Total Lead (ug/L)	12.6	1.5	88%	11	1.4	87%	12.6	0.9	93%	12.6	<1.3	90%
Dissolved Lead (ug/L)	<1.0	<1.0	NA	<1.0	<1.0	NA	0	0	NA	0	<1.0	NA
Total Zinc (ug/L)	167	32	81%	132	21	84%	167.4	40.4	76%	167.4	43.2	74%
Dissolved Zinc (ug/L)	47	24	49%	16	11	31%	47.1	30.9	34%	47.1	35.9	24%
COD (mg/L)	64	58	9%	77	62	19%	64	34.8	46%	64	55	14%

(1) Barrett, Michael, and Stanard, Christina, 2008, "Effects of the Permeable Friction Course (PFC) on Highway Runoff."
(2) Barrett, Michael, Kearfott, Pam, Malina, Joseph F. Jr., 2006, "Stormwater Quality Benefits of a Porous Friction Course and Its Effect on Pollutant Removal by Roadside Shoulders."
(3) Barrett, Michael, 2006, "Stormwater Quality Benefits of a Permeable Friction Course."

Figure 6. Mean Event Mean Stormwater Concentration Reductions for Pollutants from Permeable Friction Course Pavement Compared to Conventional Asphalt



Appendix B. Erosion Potential Calculations

The Revised Universal Soil Loss Equation (RUSLE) was used to model anticipated soil loss during the construction of the proposed project. The official Natural Resources Conservation Service (NRCS) version of RUSLE2 (version 1.26.6.4; Nov 13, 2006) was downloaded and used to perform this analysis (http://fargo.nserl.purdue.edu/RUSLE2_ftp/RUSLE2_Program_File/). RUSLE2 calculates predicted soil loss of a slope based on the soil, climate, slope length, slope steepness, plant cover, and any erosion mitigation practices performed on the slope.

Data used for the soil and climate of the project area were downloaded from the NRCS database (http://fargo.nserl.purdue.edu/RUSLE2_ftp/), and the appropriate soil type was determined from the USGS Soil Survey.

To determine the information about the physical properties of the slopes within the project area, a polygon shapefile was created in ArcMap (version 9.3) using images of the state owned right-of-way provided in the Draft EIS. Using elevation contours, five separate slopes with unique drainage directions were delineated within the Right of Way (ROW). The area and slope lengths of these segments of the ROW were determined using the "measure" tool within ArcMap. The slope steepness was determined by dividing the change in elevation down the slope by the slope length. For two of the slopes, though, this method was not practical because the steepness varied throughout the slope. To determine an average steepness in these slopes, a slope raster dataset was created in ArcMap from the elevation data contained in the elevation contour lines of the map.

Figure 7. State-Owned Right of Way for Proposed SH45SW

July 25, 2014

Note: Base aerial photograph predates construction project.

Based on the information provided in the section "Vegetation" within section 3.8.1 "Existing Conditions of Ecological Resources" (pg. 201), it was determined that the cover of the project area was best represented by "warm season grass; unharvested" within RUSLE2. Each of 5 segments of the ROW was modeled, producing estimates of soil loss in units of tons/acre/year. These sediment loading factors were multiplied by the area of each segment to give soil loss in tons/year. For construction phase soil loss, the same parameters were used with the addition of construction practices. An 18-month construction phase was assumed, with the project divided into three sections taking six months each to complete. Beginning in February, the first section modeled contained segments 4 and 5, the second section contained segment 3, and the third section contained segments 1 and 2. The construction practices included in the model were "bulldozing, clearing and cutting," "bulldozing, filling and leveling," and "paving." The output from RUSLE2 was evaluated the same way as for existing conditions, and totaled for the entire ROW as well as the areas (segments 3 and 4) that drain into Bear Creek (Table 3). To determine the soil loss with sediment controls in place, the construction phase soil loss results were divided by 0.1, assuming a 90 percent sediment control goal.

Table B-1. Calculated Soil Loss within the State-Owned ROW using the Model RUSLE2 under Varying Conditions

Soil Loss (tons/year)	Existing Conditions	Construction (No Controls)	Construction (With Controls)
Entire ROW	5.37	514.04	51.40
Into Bear Creek	3.01	346.10	34.61

S.O.S.

SAVE OUR SPRINGS ALLIANCE

T.X.D.O.T.
RECEIVED
AUG 14 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

August 13, 2014

Texas Department of Transportation
Austin District
Attention: Stacey Benningfield
P.O. Box 15426
Austin, Texas 78761-5426

CMR 7013 1090 0000 4339 2479

Re: Comments on State Highway 45 Southwest

Dear Ms. Benningfield:

Enclosed please find comments to the proposed SH 45 SW project. I'm submitting these comments in my individual capacity and not as staff attorney for Save Our Springs Alliance, Inc.

If you have any comments or concerns please feel free to contact me at 512.477.2320 ext. 305 or by email at adam@sosalliance.org.

Sincerely,

Adam Abrams

MIX
Paper from responsible sources
FSC® C103525

(512) 477-2320 voice
(512) 477-6410 fax

Save Our Springs Alliance
P.O. Box 684881 • Austin, Texas 78768
905 West Oltorf Street, Suite A • Austin, Texas 78704

http://www.sosalliance.org
email: sosinfo@sosalliance.org

Comments on SH 45 SW
Submitted by Adam Abrams

I. General Comments on Draft Environmental Impact Statement

The draft Environmental Impact Study (DEIS or draft EIS) fails to analyze the whole project. TxDOT is currently moving to build 45SW at the same time it is proposing to build freeway main lanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections and to expand South Mopac from Slaughter Lane all the way up and across Lady Bird Lake to Cesar Chavez with up to three additional lanes in each direction. This is the real project: an expanded and tolled Mopac/45SW loop that, if built, would convert Mopac from a local commuter highway to an alternative Interstate 35. An honest environmental analysis must look at this whole project – rather than chopping it into four separate pieces as TxDOT is currently doing.

The DEIS acknowledges that critical studies on caves, sinkholes, and other aquifer recharge features in the right of way are not completed. As a result, the actual alignment and controls for managing storm runoff pollution during construction and post-construction have yet to be designed.

The DEIS ignores the noise, air, light, and visual pollution that will result from the 15,000 to 40,000 more cars and trucks dumped on to south Mopac and the necessary expansion and construction on Mopac from 45SW all the way north to Cesar Chavez. The DEIS fails to examine the noise and visual intrusion on Wildflower Center gardens from the increased car and truck traffic and the construction of elevated connector bridges at the 45SW/Mopac, Lacrosse/Mopac, and Slaughter/Mopac intersections. Elevations of these connecting bridges and the lights for them are not disclosed, so it is impossible for either TxDOT analysis or independent analysis.

These omissions result in the DEIS being severely deficient, inadequate and premature. Because the DEIS fails to meet minimum TxDOT rules for DEIS's it should be withdrawn and re-issued when the underlying reports are complete.

II. Specific Comments on Indirect Impacts Technical Report Appendix "D"

a. Comment on Use of Pesticides and Herbicides

The Draft EIS states "To reduce potential water quality threats, TxDot would ***agree*** to abstain from the use of pesticides (including herbicides) in conjunction with the maintenance of the proposed SH 45 SW." See page D-41. Appendix "H" of the Draft EIS states: "Pesticides and fertilizer would not be applied in the buffer zones" pg. H-33. Moreover, appendix H states that "Pesticide use in conjunction with the proposed project's construction and operation would be done in accordance with TxDOT standards as detailed in the Roadside Vegetation Management Manual (TXDOT, 2013)." See page H-92.

The language ***"would agree to abstain from"*** does not mean TxDot will actually abstain from using pesticides in the ROW. The Draft EIS is contradictory and TxDot needs to commit to abstaining from using pesticides and herbicides on the SH 45 SW ROW. If a landscaping plan has yet to be finalized can TxDot commit to abstaining from use of pesticides or herbicides in the ROW? Has a landscaping plan been finalized? The Draft EIS needs to clarify the applicable use of pesticides and herbicides associated with the project and the post project maintenance.

b. Comment on Area of Influence

The defined Area of Influence (AOI) is deficient and should be expanded based on the natural resources that could be potentially impacted-most notably the Barton Springs Salamander and Austin Blind Salamander. Table- 4-2 indicates "Both the Austin blind salamander and the Barton Springs salamander are only known from the waters of Barton Springs in South Austin" pg. D-11. Moreover, Table 4-2 states both species of salamander "could be indirectly impacted due to possible groundwater impacts from induced development." This logic suggests that the AOI should be expanded north to the Colorado River based on TxDot's acknowledgment of potential indirect impacts on salamanders in and around the Barton Springs pool. Furthermore, while these species of salamander are found in the Barton Springs complex, they are also known from nearby springs and caves. The Austin blind salamander likely has a much wider range. As such, expansion of the AOI north to the Colorado would be appropriate to fully analysis indirect impact on the subsurface aquifer and its natural resources.

c. Comment on Induced Development and Growth

"...Approximately 13, 612 acres, or 33 percent of the AOI, consists of developable land (including land planned for development). Pg. D-44. The Draft EIS indicates the potential for a 214.8 acre retail/multi-family southwest of SH 45SW and Bliss Spiller. Pg. D-53. In addition, attached hereto and marked exhibit "A" is a development agreement for the Hays Commons Subdivision between Walters Southwest and the City of Hays. The development agreement conditions the proposed development on the building of SH 45 SW. Ex. A -pg. 13 Section 6.08 "*No Independent Obligation to Construct*". The City of Hays did not respond to the indirect and cumulative effect questionnaire sent to governmental jurisdictions Table 7-4 on pg. D-48. Indirect effects are "probable not just possible". Pg. D-1. Because one if not both of these proposed developments are ***probable***, the Draft EIS needs to evaluate their indirect impacts in greater detail, most notably an evaluation of the probable impervious cover, pollution load estimates and method of disposing of sewage.

d. Comment on Water Quality

There is 6,028 acres of developable land within the AOI which is located over the recharge zone of the Edwards Aquifer and 2,744 acres over the contributing zone. The draft EIS does not consider the probable impacts from likely developments that utilize land application of

treated effluent when access to central sewage lines is not feasible. Simply restating TCEQ regulations or reiterating that the United State Fish and Wildlife Service (FWS) has determined the Texas Pollution Discharge Elimination System program (TPDES) won't result in a take of salamanders or diminish water quality fails to address the indirect impacts of land application of treated effluent already recognized by the United State Geological Survey (USGS) and FWS.

> Residential irrigation of wastewater effluent is another source leading to excessive nutrient input into the recharge and contributing zones of the Barton Springs Segment of the Edwards Aquifer (Ross 2011, pp. 11–18; Mahler et al. 2011, pp. 16–23). Wastewater effluent permits do not require treatment to remove metals, pharmaceutical chemicals, or the wide range of chemicals found in body care products, soaps, detergents, pesticides, or other cleaning products (Ross 2011, p. 6). These chemicals remaining in treated wastewater effluent can enter streams and the aquifer and alter water quality within salamander habitat. A USGS study found nitrate concentrations in Barton Springs and the five streams that provide most of its recharge much higher during 2008 to 2010 than before 2008 (Mahler et al. 2011, pp. 1–4). Additionally, nitrate levels in water samples collected between 2003 and 2010 from Barton Creek tributaries exceeded TCEQ screening levels and were identified as screening level concerns (TCEQ 2012b, p. 344). ***The rapid development over the Barton Springs contributing zone since 2000 was associated with an increase in the generation of wastewater (Mahler et al. 2011, p. 29). Septic systems and land-applied treated wastewater effluent are likely sources contributing nitrate to the recharging streams (Mahler et al. 2011, p. 29).***
>
> 78 FR 512789, 51306-51307 (August 20, 2013).
>
> Because the probability of the proliferation of septic systems and land-application of treated effluent over the contributing and recharge zones, which both cause excessive nutrient input into the aquifer, as a result of induced development from SH 45 SW is high-their impacts must be evaluated in the EIS.

e. Comment on Groundwater Resources

The Draft EIS does not evaluate or even mention the probable drilling of exempt waters wells as a result of development in the AOI. While the Barton Springs Edwards Aquifer Conservation District (BSEACD) does regulate ground water use, its rules allow for the drilling of exempt wells not capable of producing more than 10,000 gallons per day. BSEACD Rule 3-1.3. Water Supply Companies (WSC) that answered the indirect and cumulative effect questionnaire, indicated SH 45 SW could result in additional development in their service areas or the larger AOI. Pg. D-52. For those property owners who live outside the service areas of water providers or desire more or free water, exempt wells are viable options. More alarming is

that the BSEACD does not meter exempt wells as of yet, so the BSEACD's no pumping scenario cannot be equivalent to a natural drought when exempt pumping is still taking place thus raising concerns about spring flow and corresponding harms to both the Barton Springs and Austin Blind Salamander. As such, because the high probability of the proliferation of exempt wells in the AOI as a result of the expected development induced by SH 45 SW it is an indirect impact that must be analyzed in the EIS. Many other deficiencies of the DEIS's, as it relates to groundwater, have been expressed by the BSEACD' staff in their preliminary review of the DEIS attached hereto and marked exhibit "B".

Ex. A

DEVELOPMENT AGREEMENT FOR THE
HAYS COMMONS SUBDIVISION

This Development Agreement for the Hays Commons Subdivision (this "**Agreement**") is made, entered into, and effective, as of September 3, 2013 (the "**Effective Date**") by and between the City of Hays, a Texas general law municipal corporation (the "**City**"), and Lukers, Inc., a Texas corporation dba Walters Southwest (**Developer**"). The City and the Developer are sometimes referred to herein as the "**Parties.**" The Parties hereby contract, covenant and agree as follows.

I. BASIC TERMS

Section 1.01. Property. Developer owns, or has under contract with the right to develop upon closing, approximately 329.69 acres of land, as more particularly depicted or described in Exhibit "A" attached hereto and incorporated herein for all purposes, located primarily within the extraterritorial jurisdiction of the City (the "**Property**"). A portion of the Property (being approximately 50.29 acres) is located in the ETJ of the City of Austin (the "**Austin ETJ Tract**"). Unless specifically provided otherwise herein, or until annexed into the City, the Austin ETJ Tract is not part of the "Property" in this Agreement as that term pertains to land use regulation affecting the Property.

Section 1.02. Conceptual Plan. The Property is proposed for development as a multi-phase mixed-use "**Project**"(herein so called) that could include some or all of parkland, single family and multifamily residential uses, and commercial uses and services as generally and preliminarily shown on the concept plan attached hereto as Exhibit "B" and incorporated herein for all purposes (the "**Conceptual Plan**"). Subject to the terms of this Agreement, Developer will subdivide and develop the Property, which shall be known as the Hays Commons Subdivision (the "**Subdivision**"), and obtain water and wastewater service and other City services for the Subdivision to the extent and as set out in this Agreement.

Section 1.03. Applicable Regulations. The zoning, subdivision, and site planning of the Property shall be subject to the processes, notices, hearings and procedures applicable to all other properties within the City that are or were subject to the Applicable Regulations except as may be specifically provided otherwise in this Agreement. For purposes of this Agreement, the **"Applicable Regulations"** are the City's Subdivision Code, including site development standards, sign ordinance, zoning ordinances, and other rules and regulations adopted by the City Council pertaining to land development as they exist in adopted form as of the Effective Date of this Agreement, subject to Chapter 245 (defined below). Developer may modify and change the Conceptual Plan for the Subdivision at its discretion, prior to initiating the development approval process at a time of its choosing by paying the applicable fees and filing a preliminary plat with the City. It is acknowledged that Developer and the Property are entitled to the benefits of Chapter 245 of the Texas Local Government Code ("**Chapter 245**"). For purposes of Chapter 245, the parties agree that the date of application for the permit or the first in the series of permits required for any development of the Property shall be May 2, 2012.

Section 1.04. Infrastructure; Development. As of the Effective Date of this Agreement, the City does not have the water or wastewater utility infrastructure or capacity to serve all of the intended development of the Property and the City does not have a source of revenue for paying for construction of public infrastructure necessary for development of the Property. The Parties want to work together to obtain water and wastewater utility service to the Property, to annex and zone the Property appropriately, to fund construction of necessary public

infrastructure, and to develop the Property according to mutually acceptable land design standards.

Section 1.05. General Benefits. This Agreement governs land in the extraterritorial jurisdiction of the City, pursuant to Section 212.172 of the Local Government Code. Developer will benefit from the certainty and assurance of the development regulations applicable to the development of the Subdivision and by virtue of the services that will be made available to the Subdivision pursuant to the terms of this Agreement. The City will benefit from this Agreement by virtue of its control over the development standards for the Property.

Section 1.06. Advances for City Expenses. As of the Effective Date, Developer has advanced $30,000 for payment of City engineering and legal consultant fees for review of the Project and this Agreement, and Developer may advance additional money for such fees as the development process moves forward, subject to discussion between the parties regarding any such fees. All such prior (but not prior to May 2, 2012) and future advances shall be reimbursed through tax rebates as part of the Development Incentives, as discussed in Article VI below.

Section 1.07. Term of Agreement. The term of this Agreement shall be five (5) years from the Effective Date plus an automatic additional five (5) year extension unless the Developer elects to terminate at the end of the initial five years, plus two (2) 2-year additional extensions if mutually acceptable to the Parties (the "**Term**"), subject to earlier termination as may be expressly provided in this Agreement, including if the Subdivision is fully developed and built-out by Developer, and subject also to Section 6.04(b) regarding reimbursement payments to be made to Developer hereunder beyond the otherwise applicable Term.

Section 1.08. Consideration. The benefits to the Parties set forth in the foregoing provisions, together with the other mutual promises expressed herein, are good and valuable consideration for this Agreement, the sufficiency of which is hereby acknowledged by both Parties.

Section 1.09. Investment Backed Expectations. The Parties have agreed that Full Development of the Property, as governed by the terms and provisions of this Agreement, with the benefit of the Development Incentive represents the reasonable investment backed expectations of the Developer and the City with respect to the Property.

II. ANNEXATION

Section 2.01. Petition for Annexation. Upon application for annexation filed by Developer for all or an identified portion of the Property (other than the Austin ETJ Tract), the City and Developer will work together to cause the voluntary full purpose annexation of such portion of the Property as set forth in this Agreement. Unless requested to do so by the City and agreed to by Developer, Developer will not ask the City to annex any portion of the Property on which a multifamily, single family, or other residential project is planned to be constructed.

Section 2.02. City Action. The City agrees to post action for final annexation of any such annexation tract on the same City Council agenda for the meeting at which the zoning for such annexation tract is posted for consideration of and possible action for final approval. It is the intent of the Parties that any portion of the Property not be annexed unless such portion will receive final zoning approval at the same City Council meeting.

Section 2.03. Failure to Annex. Notwithstanding any other provision of this Agreement to the contrary, if the City does not annex the first portion of the Property for which Developer requests annexation (other than the Austin ETJ Tract), including if there is a legal

obstacle to such annexation that is not caused by Developer, Developer may elect to declare that this Agreement is no longer in effect, including, without limitation, any provisions hereof relating to site development standards. Developer may also elect not to terminate this Agreement. Any such termination of this Agreement by Developer shall not, in and of itself, affect Developer's or the Property's Chapter 245 rights.

Section 2.04. Additional Property. Developer, at its election, may add the approximately 50.29-acre Austin ETJ Tract shown on the Conceptual Plan to the coverage of this Agreement as part of the Property for land use purposes, provided, however, that (A) in order for Developer to be able to add any of the Austin ETJ Tract, sufficient water and wastewater capacity must be available to serve development thereon, and (B) any of the Austin ETJ Tract annexed into the City and made subject to this Agreement shall be part of the Commercial Area for all purposes hereunder, provided that the City may choose not to annex any portion of the Austin ETJ Tract developed or to be developed as multifamily. The parties hereby agree to cooperate with each other to obtain the consent of the City of Austin to release the Austin ETJ Tract from the City of Austin's ETJ into the ETJ of the City of Hays. In the event that such ETJ release occurs and the Austin ETJ Tract becomes an area within the ETJ of the City of Hays, the Austin ETJ Tract shall immediately be made subject to this Agreement. Developer covenants to begin development of the Project, and to complete the first approximately 351,000 square feet of retail and restaurant space proposed for the Project, on acreage of the Property located either in the City limits or the current ETJ of the City of Hays as shown on the Conceptual Plan.

III. ZONING

Section 3.01. Zoning. In connection with, and as a condition to, annexation of the Property into the City, the parties acknowledge that Developer will file one or more zoning cases to zone the Property as residential, commercial or parkland as appropriate under the City's zoning code and as generally reflected on the Conceptual Plan, and subject to the Applicable Regulations.

Section 3.02. Rural Zoning. There may be up to a maximum of forty (40), minimum one-acre residential lots in the area designated "Rural Residential" on the Conceptual Plan.

Section 3.03. Commercial Zoning. In the areas designated "Commercial" on the Conceptual Plan, all commercial uses allowed in the City's "R" (Retail District) and "O" (Office District) categories as of the Effective Date, as well as multifamily uses, shall be allowed, provided that the City may choose not to annex any area developed or to be developed as multifamily. There shall be no more than two retail uses in excess of 75,000 rentable space in the Commercial area unless otherwise agreed to by the City. Subject to the foregoing limitation, and notwithstanding any provision of the City's Code to the contrary, no "big box" or other size limitation shall apply to retail uses in the Commercial area. Developer covenants that there will be no vertical mixed use in the Project.

Section 3.04. Parkland. The areas designated "Parkland" on the Conceptual Plan shall remain open space, although improvements may be made subject to the impervious cover limits in this Agreement, or as otherwise approved by the City in its sole discretion. The City shall cause any water quality ponds made necessary by City Parkland improvements to be constructed on the Parkland and maintained. The City and Developer will not share ponds made necessary by their respective improvements, unless mutually agreed to by the Parties. The Parkland areas shall be dedicated no later than the later to occur of (i) recording of a plat or plats of the first twenty-five (25) acres (in the aggregate) out of the Property or (ii) finalization of Developer's construction loan for construction of the Project, and will be dedicated to and accepted by the City as is, where is, and subject to all matters of record or visible or apparent on the ground. The area of the Parkland shall be included in the gross site area of the Property for calculation of the impervious cover that the parties may construct on the Property. The dedication and acceptance

of the Parkland described herein shall satisfy any and all parkland dedication or fee requirements now or hereafter required by the City in connection with development of the Property.

Section 3.05. Impervious Cover. (a) The Parties agree that (1) as of the Effective Date there are approximately 279.4 acres of the Property located within the City's limits or extraterritorial jurisdiction upon which these impervious cover calculations are based, (2) the amount of impervious cover that the City may construct on the Parkland is up to and including two percent (2%) of the gross site area of the Property (which at 2% equals 243,428 square feet, or 5.588 acres, of impervious cover), which impervious cover may be used by the City only on the Parkland, and (3) the amount of impervious cover that the Developer may construct on the Property is up to and including twenty-two percent (22%) of the gross site area of the Property (which at 22% equals 2,677,709 square feet, or 61.471 acres, of impervious cover), which impervious cover may be used anywhere on the Project (other than the Parkland). Under no circumstances may the City reduce the forgoing percentages or amounts of aggregate impervious cover. None of the impervious cover that may be used on the Property shall be reduced to provide or account for boundary street impervious cover for SH 45 or any other adjoining road. If the Austin ETJ Tract is added to the coverage of this Agreement pursuant to Section 2.04, then the additional amount of impervious cover that the Developer may construct on the overall Property with the addition of the Austin ETJ Tract is twenty-two percent (22%) of the additional gross site acreage, or such lower amount as the City of Austin may designate as a condition of its release, which additional impervious cover may be used anywhere on the Project (other than the Parkland) as long as the total aggregate amount of allowable impervious cover is not exceeded.

(b) Developer shall allocate to each Rural Residential lot as it is conveyed a maximum amount of impervious cover that may be constructed on that lot. As Developer conveys Rural Residential lots, and conveys or holds back corresponding impervious cover for any such lot, any portion of the impervious cover that is retained by Developer (and not conveyed to the grantee of such lot) may be used by Developer anywhere else on the Property. Impervious cover used and/or conveyed in the Rural Residential area is deducted from the total amount of impervious cover made available to Developer pursuant to the preceding paragraph. Impervious cover that is allotted to but not used by the grantee of such Rural Residential lot may be used elsewhere on the Property, subject to the overall 22% limitation. Any lot or area designated as "Commercial" on the Conceptual Plan may contain in excess of twenty-two percent (22%) impervious cover as long as the total impervious cover ultimately constructed on the Property does not exceed the aggregate total allowable impervious cover on the Property as provided above.

(c) This Agreement shall govern calculations of impervious cover; Developer shall not be required to meet the exemption requirements of Subdivision Code Section 10-6(5). Notwithstanding any Code section that indicates otherwise (e.g., the definition of "impervious cover"), the calculation of impervious cover shall conform to Code Sec. 10-6(5)(c) so that permeable pavement and permeable or interlocking pavers shall not be considered impervious cover. Man-made areas of compacted or uncompacted rock or stone (except for trails) shall be considered impervious cover; trail areas shall be considered pervious. Man-made areas of caliche constitute impervious cover, except that in the Rural Residential area a man-made caliche access drive, other than a primary access drive, shall not constitute impervious cover. Any impervious cover on the Property attributable to City improvements, facilities, or amenities, including without limitation any such improvements located in the Parkland Area, shall not count against the total aggregate amount of impervious cover that Developer may construct in the Commercial and/or Rural Residential areas of the Property.

IV. PLANS AND PLATS; DEVELOPMENT STANDARDS

Section 4.01. Conceptual Plan. On or about May 2, 2012, Developer submitted to the City an application for approval of the Conceptual Plan shown on Exhibit "B". Upon execution of this Agreement, the Conceptual Plan is hereby approved by the City.

Section 4.02. Preliminary Plat. Developer shall prepare and submit for approval by the City a "**Preliminary Plat**" (herein so called) that is materially and substantially consistent with the then current approved Conceptual Plan. The Preliminary Plat may be for a single lot subdivision. Notwithstanding any provision of the Code to the contrary, Developer shall file an application for approval of its Preliminary Plat on or before the date that is two (2) years after the Effective Date.

Section 4.03. Final Plats. Developer shall file an application for a final plat of all or a portion of the Property within three (3) years after the date that the Preliminary Plat is approved by the City. At Developer's election, Developer may process preliminary and final plats simultaneously. Developer shall construct or post fiscal for subdivision infrastructure described on the final plat pursuant to the Applicable Regulations and the regulations of any other applicable Hays County regulatory authority. Developer shall not be required as a condition to approval of any final plat to improve existing public streets adjoining land that is part of the final plat unless required to do so by any other applicable Hays County regulatory authority.

Section 4.04. Construction Plan. A Construction Plan must be submitted and approved for any development on the Property other than single family residential, and no Construction Plan, except for street, drainage, and water construction plan, is required for development of single family residential unless required by other Hays County regulatory authority. Developer may, but is not required to, submit and process its application for approval of Construction Plans simultaneously with the application for approval of the final plat for the portion of the Property to which such Construction Plans apply. Construction Plans shall be approved, if they comply with City construction plan requirements, the applicable construction requirements of any other governmental entity with jurisdiction over the Property, and the terms of this Agreement, by or under the direction of the City Mayor.

Section 4.05. TIA; Curb Cuts; FM 1626. The Property is located along and adjacent to FM 1626, Bliss Spillar Road, and proposed SH 45, and access to and from the Commercial Area shall be primarily by way of those highways, including from the intersection described in Sec. 6.08, below. No access to the Commercial Area from the Parkland shall be permitted, and no vehicular access across the Water Quality Transition Zone or Critical Water Quality Zone shall be permitted in any event. With respect to the City's Code, Developer shall not be required to submit a traffic impact analysis in connection with any application to the City for any approval required for development of the Project unless the primary Property entrance is from FM 1626. The City shall support Developer's applications for curb cuts into the Property from SH 45 and FM 1626. The current primarily rural character of FM 1626 near the Property will be respected, and Developer will not place a pylon sign or bright lights adjacent to FM 1626.

Section 4.06. Permits. All plans and plats for development in the Project shall be applied for, reviewed, and approved in accordance with the Applicable Regulations, unless otherwise specified in this Agreement.

Section 4.07. Tree Preservation; Landscaping.

(a) The existing natural landscape character, especially native oaks, elms, madrone, pear and pecan trees, shall be preserved to the maximum extent reasonable and feasible. For example, in an area of the street yard containing a stand of trees, Developer shall use best good faith efforts to preserve and protect such trees. Celtis Occidentalis (Hackberry) and Juniperus

Virginiana and Juniperus Ashei (Common Cedar) with a caliper of less than twelve inches (12") are excluded from this provision, except for those located within the first twenty-five feet (25') from public street rights-of-way. Indiscriminate clearing or stripping of natural vegetation on a lot is prohibited. Any part of a site not used for impervious cover and City approved construction staging and storage areas shall be retained in a natural state, or reclaimed to its natural state, to the greatest extent feasible, or attractively landscaped in a manner that adds aesthetic value to the development and the area and consistent with the approved plant list attached hereto as Exhibit "C".

(b) At the completion of development, at least sixty (60) percent of the caliper inches of all existing trees over four inches (4") caliper must be retained or replaced after site development. All trees with a minimum four-inch (4") caliper, whether preserved or proposed in a landscape plan, shall count toward this percentage. In order to promote the retention of larger trees, all preserved trees with a caliper equal to or greater than twelve (12) inches may be computed at one hundred fifty (150) percent of their actual caliper in the post-development calculation. Clusters of three or more trees located less than ten feet apart shall be credited at one hundred fifteen (115) percent for each tree in the cluster with a minimum four-inch (4") caliper.

(c) The removal of any tree with a caliper of four inches (4") or larger, or of any specimen tree (i.e., an oak, elm, pear, or madrone of a caliper of at least twelve inches), must be specifically requested by the Developer and approved in writing by the City prior to any action being taken to remove the tree or to damage or disturb the tree in any way. Removal of such trees without this approval is expressly prohibited.

(d) No more than 25% of the new trees to be planted on a platted lot shall be of the same species in order to encourage a diverse landscape that will not be subject to loss to a specific disease or insect.

(e) To the extent, if any, that the Applicable Regulations address preservation of certain categories of trees, whether by kinds, size or otherwise, replacement of caliper inches removed, or other impacts of development on tree cover, and notwithstanding any such Applicable Regulations, Developer shall not be required to seek approval from the City's council or any board or commission for removal of any category of tree. Developer shall not be required to submit a tree survey under the Applicable Regulations, if at all, until such time as a Construction Plan is required to be filed.

Section 4.08. Construction in the Water Quality Transition Zone. Pursuant to Subdivision Code Sec. 10-6(2) (Water Quality Transition Zone), the City agrees that the water quality transition zone located on the Property and outside of the Parkland may be used for construction and maintenance of water quality and/or detention pond(s), utility lines, drainage facilities, and similar infrastructure facilities. Any construction within the Parkland must be approved by the City in writing prior to such construction.

Section 4.09. Removal of Existing Vegetation. The City agrees that, notwithstanding Subdivision Code Sec. 10-6(6), mowing and brush removal may occur in any water quality transition zone, and that the prohibition against clearing of existing vegetation shall apply only to trees and any protected environmental feature. Further, once a construction plan (or, as described in Sec. 10-6(6), a "site plan") is approved, any further vegetation clearing that has been approved pursuant to such plan may occur.

Section 4.10. Lighting and Signage. (a) Notwithstanding any provision of the Applicable Regulations (including the City's sign ordinance) to the contrary, lighting and signage for the Commercial area of the Project shall comply with the criteria attached hereto as Exhibit "D", provided, however, that Developer may request, and the City may approve or

disapprove in its discretion, changes to the attached criteria based on technological developments. Each pad in the Commercial area of the Project shall be allowed one freestanding monument sign conforming to the attached criteria. Notwithstanding the foregoing, each anchor store permitted on the Project pursuant to Section 3.03 may have, in addition to its permitted monument sign, (i) building signage on up to 25% of the surface of each street-facing wall of such building, exclusive of glass area, and (ii) one (1) freestanding pylon sign up to thirty (30) feet in height containing no more than three hundred (300) square feet of sign area on each side of the sign. No pylon signs shall be located along or beside the FM 1626 right of way.

(b) In addition to the signage permitted in the preceding subsection (a), the Commercial area of the Project may contain, in the aggregate, (i) up to two (2) multi-tenant pylon signs, and (ii) two (2) fuel outlet signs. Any such multi-tenant sign may not exceed thirty-five (35) feet in height, and may not exceed three hundred (300) square feet of sign area on each side of such sign. Fuel outlet signs may not exceed thirty (30) feet in height, and may not exceed one hundred twenty (120) square feet of sign area on each side of such signs.

V. UTILITY SERVICE

Section 5.01. City of Austin Utilities. (a) Developer, in cooperation with City representatives, will prepare and negotiate water and wastewater service agreement requests (collectively, a "**WSA**") with the City of Austin for extending water and wastewater services to the Property including the Rural Residential area shown on the Conceptual Plan (the "**Rural Area**" and the Austin ETJ Tract(if annexed into the City's ETJ), provided that the City shall be the named applicant and shall have the right to approve the application prior to its submittal to the City of Austin. If the WSA is approved by the City of Austin, such approved WSA shall be subject to the final acceptance or non-acceptance by the City of Hays in the City's sole discretion. Developer covenants to seek the shortest route from City of Austin facilities to the Property that the City of Austin will allow. Any application to the City of Austin for water and/or wastewater service may, at the City's request, include provisions for additional services to the existing City of Hays service area, provided that Developer shall not be responsible for the costs or construction of any improvements for any such additional services. The City shall be the wholesale customer for any such water or wastewater service, and shall provide such services to the Property on a retail basis.

(b) If the WSA is not issued by the City of Austin by the first anniversary of the Effective Date, then Developer may, but is not required to, elect to seek approval from the Texas Commission on Environmental Quality for the use of any commercially reasonable alternative method of wastewater treatment or removal and/or any available alternative source of water service (collectively, "**Alternate Utility Service**"). The City is not required to support an Alternate Utility Service, but will consider the use thereof and will not oppose Developer's application to the TCEQ for approval of any such Alternate Utility Service that is mutually agreeable to the City and Developer. If Developer proposes an Alternate Utility Service, the feasibility of any such Alternate Utility Service shall be subject to the reasonable review and approval of the City, and shall be subject to a reimbursement cap as described in Section 6.02, below. If the Parties can not agree on a feasible Alternate Utility Service and/or a reimbursement cap for the costs of such service, then either Party may terminate this Agreement by written notice thereof delivered to the other party.

Section 5.02. Rural Area Water. Water service to all of the Rural Residential lots shall be provided by Developer from the Commercial Area. Developer shall pay 100% of additional costs associated with providing water service to and within the Rural Area, provided that any such costs associated with (i) offsite improvements, or (ii) water lines installed between the

western boundary of the Commercial Area and the eastern boundary of the Rural Residential area shall be included within the Eligible Costs.

Section 5.03. Fees. Residential and commercial customers in the Project, which shall become a separate rate district, shall be required to pay water and wastewater service fees (whether the City is a direct provider or is itself a wholesale customer of the City of Austin) as set out in a new tariff for that new district based on the costs of the improvements and facilities necessary for such water and wastewater service and the number of LUEs of service made available by such facilities. Developer and/or customers in the Project shall pay the City's standard rates for water meters.

Section 5.04. Water/Wastewater Impact Fees. The City will not adopt or charge water and/or wastewater impact fees for service provided within the Property through the lines and other facilities constructed by or on behalf of Developer pursuant to this Agreement.

Section 5.05. Level of Service. From and after final approval of each Construction Plan within the Project by the City, the City will provide utility service to customers within that phase of the Project subject to the conditions stated in this Agreement and the City's policies and ordinances, provided, however, that none of such policies or ordinances shall be construed or implemented to reduce the level of water and/or wastewater service to the Project from the level of service necessary to serve the uses indicated on the Construction Plan, except as may be limited or restricted in the WSA with the City of Austin or other provider of water or wastewater service to the Property.

Section 5.06. City Maintenance and Operation of Facilities. (a) Subject to possible Developer maintenance of water quality and/or detention ponds, as described in this Section 5.06, following the completion by Developer of any water, wastewater, or water quality control required hereunder for development of the Property, and following the City's inspection of such facility pursuant to standards applicable to all such facilities in the City under the City's Code, the City shall accept the transfer of such facility from Developer by bill of sale to the City for operation and maintenance. At the time of the City's acceptance of any such facility, Developer shall post fiscal with the City in the amount of the Developer's good faith estimate of one year of maintenance costs for such facility, which fiscal may only be used by the City for actual and necessary costs of maintenance of that facility. At the end of one year after the date of the City's acceptance, all unused portions of Developer's fiscal shall be returned to Developer or otherwise released. Subject to Developer's obligations under Section 6.04(b) of this Agreement, the City hereby expressly agrees that after such time as any water, wastewater, and/or water quality control facility and appurtenances has been transferred to the City, all future operation and maintenance of the facility will be assumed and performed by the City such that none of the Subdivision Code sections pertaining to a developer's obligation to perform or pay for such operation or maintenance, to obtain new or renewal permits for such facilities, to submit documentation regarding the condition of such facilities, to pay 5 years or any other period of estimated maintenance costs, or to take any other action or pay any other amount shall apply. Notwithstanding the foregoing to the contrary, the City may elect not to accept ownership (or the obligation of maintenance and operation) of any water quality and/or detention pond that is used for detaining and/or treating stormwater runoff from the Commercial Area, in which case Developer (or Developer's transferees, assignees, or agents) shall be responsible for such maintenance and operation.

(b) Developer may use up to a maximum of 50 acres of the City's Parkland area for a re-irrigation area to be used in connection with the treated stormwater runoff from the Commercial

Area, and the City hereby grants to Developer, and its successors and assigns, a perpetual, nonexclusive easement for such purpose. In designing and construction any such re-irrigation area in the City's Parkland, Developer will not materially interfere with City improvements in the Parkland. If and to the extent that Developer elects to construct a re-irrigation system in the Parkland, the City and Developer will work together to determine the location of such area, describe it in a legally adequate way, and make such legal description an addendum to the grant of this easement. Developer will be responsible for the construction, maintenance and operation of any such re-irrigation system in the Parkland, provided that after the date on which the "Service Revenues" equal the costs of "City Services" (as those terms are defined in Section 6.04(b) below), the City shall maintain and operate the re-irrigation system located on its Parkland even though the water in the re-irrigation system is wholly or partly runoff from the Commercial Area. Upon acceptance by the City of the maintenance and operation of re-irrigation facilities located within the parkland, the City reserves the right to connect to such facilities for the purpose of re-irrigating stormwater runoff from the City's Parkland improvements; provided, however, that such connections shall not interfere with the operation or maintenance of any portion of the water quality facilities serving the Commercial Area. All stormwater quality facilities, whether serving the City's Parkland improvements or the Commercial Area, or both, shall be designed by a professional engineer licensed in the State of Texas.

VI. PUBLIC IMPROVEMENTS; TAX REBATES

Section 6.01. Public Improvements. The Parties agree that Developer, in connection with development of the Property, may incur the hard and soft costs (including design, construction management, and contingency costs) of: (i) water and wastewater lines (including related facilities, e.g., lift stations) to be brought to the boundary of the Property (including all of the water and wastewater lines between the Property and existing City of Austin facilities); (ii) any Alternate Utility Service made necessary by the City of Austin's non-approval of the WSA (but only if the City did not oppose the Alternative Utility Service, and subject to the reimbursement cap for Alternative Utility Service described in Section 6.02 below); and (iii) funds advanced to the City for the City's expenses as described above and as described in Section 6.04(b) with regard to Developer's payment of the City's Deficit Costs (such items and actions, together with other reimbursable items described below, collectively herein, the "**Public Improvements**"), which Public Improvements are for the benefit of the City. The Public Improvements do not include the costs of dry utilities (e.g., phone, electric, gas, cable, etc.) for the Project and, with regard to water and wastewater costs, and subject to certain oversizing costs as explained below, shall only include those water and wastewater costs for the portion of such facilities that are directly used and useful for servicing the Development at build-out. If water or wastewater service will be provided to the Property by a provider other than the City, then application, subject to the sole approval of the City, for such service may be made in the City's name, the City may become a wholesale customer of such service provider, and, if the City does become a wholesale customer of such service provider, the City shall provide such services to the Property on a retail basis. If provision of wastewater service to the Property will make construction of a wastewater treatment plant necessary, the parties agree that the City shall not own or be responsible for the costs of constructing, operating, and maintaining such plant to the extent that such plant serves the Property; provided that Developer may contract with or cause a third party (e.g., a newly created special district or a property owners' association) to provide such operation and maintenance. The City will, however, own, operate and maintain water and wastewater lines and meters located within the Property. If any water or wastewater line or related facility is required (e.g., by the City of Austin or other provider of wholesale water and/or wastewater services) to be sized larger than the minimum standard size of such line or facility that is necessary to serve the Project at build-out (i.e., "oversized"), then the incremental increase in cost for the oversized portion thereof shall not be considered part of the Public Improvements

hereunder, and any reimbursements under this Agreement shall not include such incremental increased cost for oversizing; provided, however, that if the oversizing is done at the request of the City (e.g., to provide utility service to property in the City other than the Property), then such City-requested oversizing will be considered part of the Public Improvements for which Developer may be reimbursed hereunder.

Section 6.02. Eligible Costs.

(a) The "**Eligible Costs**" (herein so called) shall be all hard and soft costs and expenses paid or incurred by the Developer constituting or incurred in connection with the acquisition, design and/or construction of the Public Improvements including, but not limited to, costs and expenses for: (i) the reasonable costs of acquisition of right-of-way or easements from third parties for any off-site portion of the Public Improvements (including, but not limited to, engineering, environmental, appraisal, and legal fees, and condemnation damages awarded for the value of land taken and for any diminution in value of the remainder); (ii) feasibility, design, engineering, environmental, consulting, survey, and legal; (iii) soils and materials testing; (iv) obtaining governmental and regulatory approvals; (v) construction management, construction, and inspections; (vi) Developer's actual financing costs up to seven percent (7%), and Developer's actual origination fee (if any) up to one percent (1%), for loans necessary for all construction hereunder, provided that such interest shall not begin accruing until the later of the date that Developer receive its first draw from its construction loan or the date that Developer and the City agree on the amount of the Eligible Costs; and (vii) amounts reimbursed by the Developer to the City for third party costs paid or incurred by the City in connection with the design and construction of the Public Improvements (including, but not limited to, inspection, engineering, and legal fees, including the fees described in Section 1.06). Although the interest described in the foregoing clause (vi) is an "Eligible Cost" that is subject to reimbursement from Tax Rebates, the interest due on outstanding Eligible Costs pursuant to that clause (vi) does not run on the interest (or origination fee) component of Eligible Costs, and the parties specifically intend that interest should not be "double counted" by charging interest on the interest component. For purposes of this Agreement, "off-site" wastewater means that portion of a sewer collection system that begins with the line exiting the first lift station required to send wastewater from the Project to (or ultimately to) a wastewater treatment facility, and "on-site" water means either water produced from a well located on the Property or that portion of a water supply system that begins with the City of Austin water meter through which water supplied to the Project is measured for billing. In the event that Developer proposes an Alternate Utility Service, the Parties, in addition to discussing the feasibility of such service, shall negotiate a maximum amount of Eligible Costs to be reimbursed to Developer for hard and soft costs for such Alternate Utility Service that is used and useful for development of the Project within the City.

(b) The Parties agree that the Eligible Costs would not be incurred but for the Project. Because of the enhanced residential, commercial and economic development in the City represented by the Development, and the Parties' intent that the reimbursements hereunder be maximized to the extent appropriate, Developer, upon written notice to the City, may reallocate unused or unnecessary budgeted amounts from one category or line item of Eligible Costs to another, subject to the terms of this Agreement regarding what costs are Eligible Costs.

Section 6.03. Development Incentives. The City has determined that development of the Property, Developer's incurring of the Eligible Costs, and the performance by the City of its duties and obligations under this Agreement, will promote local economic development within the City. The availability of the Tax Rebates is a material inducement for development of the Property, and but for such an incentive, full development of the Property would not be economically feasible. Developer has carefully weighed the benefits of developing within the City limits and has determined that development according to this Agreement will enhance the

value of the Property and enhance the ultimate value of the Project as planned and, therefore, the consideration from the City is sufficient for the costs incurred.

Section 6.04. Tax Rebates. (a) Subject to all of the terms and conditions of this Agreement, the City hereby agrees to make "**Tax Rebates**" (collectively herein so called), to the extent now or hereafter permitted by law, to Developer in an amount equal to (i) thirty percent (30%) of the "**Sales Tax Revenues**", and (ii) seventy-five percent (75%) of the "**Tax Increment**". For purposes of this Agreement: the Sales Tax Revenues are the City's portion of sales taxes collected from tax-generating activities on the Property and remitted to the City by the Comptroller; the Tax Increment is the amount of ad valorem taxes received by the City corresponding to the amount by which the assessed value of the Property located within the City's tax jurisdiction, in any given year, exceeds the assessed value of that Property as of the calendar year in which Developer begins construction (save and except in the Rural Area) of the first commercial phase of the Project. The City represents that the City's sales tax rate, as of the Effective Date, is one (1.0%) percent, and that the City's current mil for ad valorem purposes is 0.11640.

(b) The payment of Tax Rebates by the City to Developer shall commence on the date that is one year after the first day of the first month following the City's receipt of the first of the Sales Tax Revenues or the Tax Increment from the State Comptroller's Office, and shall continue on a quarterly basis until payment in full of all of the Eligible Costs, subject to the terms and conditions stated herein. The City's payments of Tax Rebates to Developer, once begun, shall continue as described in this subsection (b) even if such payments are due and to be paid after the date that is the end of the "Term" pursuant to Section 1.07. Until such time as the Service Revenues equal the costs of City Services (as those terms are defined below), at the end of each calendar quarter, Developer will pay or reimburse the City for the City's monthly Deficit Costs for the City Services according to invoices, bills, receipts or other materials reflecting such Deficit Costs (collectively, "Deficit Costs Bills") that Developer has received from the City at least fifteen (15) days prior to the end of the calendar quarter. Deficit Costs Bills not received by such date shall be paid at the end of the following calendar quarter. Developer may review the City's relevant books and records during mutually agreeable hours for the purpose of checking the accuracy of the Deficit Costs Bills. In the event that Developer fails to pay all or a portion of the Deficit Costs Bills as required hereunder, and such failure to pay is not cured within forty-five (45) days after written notice from the City of Developer's failure to pay, Developer shall be in default. For purposes of this Agreement, the "City Services" are the City's operation and maintenance of any offsite and onsite water or wastewater facilities for the Project that have been constructed since the Effective Date, and the City's "Deficit Costs" are the amount by which the City's actual and reasonable costs to provide the City Services (including, but not limited to, all operation and maintenance costs, costs of parts, replacement, and capital expenditures) exceed the revenue received by the City from the retail sale of the City Services (including water and wastewater tariff revenues and tax revenues) ("Service Revenues"). At such time that the Service Revenues equal (or exceed) the Deficit Costs, so that there are no Deficit Costs, Developer's obligation to pay the Deficit Costs Bills shall automatically terminate, provided that any such Deficit Costs Bills that accrued prior to the date that the Deficit Costs were eliminated shall still be payable by Developer.

(c) The City will provide for the payment of Tax Rebates to be made pursuant to this Agreement by establishing a separate fund, including subaccounts if necessary, or a subaccount of any existing fund or account in the City treasury, into which seventy-five percent (75%) of the Tax Increment shall be deposited. The City covenants and agrees that it will make all such payments without counterclaim or offset within 30 days of receipt of the Sales Tax Revenues from the Comptroller and the Tax Increment from the Hays County Tax Assessor-Collector (or other appropriate payor). Tax Rebates due hereunder that have not been paid to Developer on or before the last day of any month in which they are due to be paid pursuant to the preceding

sentence shall incur a late fee in the amount of WSJ prime plus two percent (2%) of the delinquent amount, calculated on a daily basis and to be paid in arrears as part of the next Tax Rebate.

(d) Tax Rebates to be made by the City pursuant to this Agreement shall be made solely from annual sales tax revenues and ad valorem tax revenues received by the City as described by this Agreement, and shall create no obligation of the City which is payable from taxes or other money of the City other than the Sales Tax Revenues and the Tax Increment payments described above.

Section 6.05. Performance Criteria. The Developer agrees and covenants that it shall perform its obligations as follows, subject to all of the terms and conditions of this Agreement, including, without limitation, subject to Section 6.08 below:

(a) Developer shall construct or cause to be constructed all private infrastructure necessary or useful for the Project as and to the extent the Project is built-out.

(b) Subject to approval of the WSA by the City of Austin, Developer shall substantially construct or cause to be constructed the water and wastewater lines to the Project.

(c) If an Alternate Utility Service becomes necessary, Developer shall construct the necessary facilities for such system.

Section 6.06. Construction, Plans, and Specifications. The plans, specifications and construction of the Public Improvements will be subject to approval by the City, by and through the City Engineer, all in compliance with the Applicable Regulations. The City agrees to cooperate with Developer in the timely review of the plans for the Public Improvements, the timely review of Eligible Costs, and the timely inspection of the Public Improvements as they are being constructed. Upon completion of the Public Improvements, and the inspection and final acceptance of same by the City, the Public Improvements will be dedicated to the City by bill of sale; whereupon, the City shall assume all responsibility for the ownership, use, operation, and maintenance of the Public Improvements. Developer will document to and obtain the concurrence of the City Engineer on the actual and reasonable Eligible Costs according to the terms of this Agreement.

Section 6.07. Right-of-Way and Easements; Eminent Domain. Right-of-way and easements for Public Improvements located within the Property will be provided by the Developer at no cost to the City, and the value of such on-site right-of-way or easements will not be an Eligible Cost. Both parties agree that all onsite and offsite utility facilities to be owned and operated by the City shall be located in 20-foot wide (unless the City agrees to a narrower width) private, dedicated easements, except to the limited extent that such a utility easement might cross a public road or other public facility. The Public Improvements are a necessary and required improvement for the City's water and wastewater system, and a public necessity exists for such Public Improvements. To the extent feasible, the City, at no cost to Developer, will provide use of all necessary City lands, rights-of-way and easements and will provide further required City easements or lands in fee simple as may be necessary for construction of that part or portion of the Public Improvements that are located outside the boundaries of the Property; provided, however, that if for purposes of timing or other considerations Developer elects to acquire one or more of such rights-of-way or easements directly, then the reasonable cost of such acquisition by Developer shall be an Eligible Cost subject to reimbursement hereunder. The City agrees to use its power of eminent domain, if necessary, to acquire such lands or easements as may be necessary for the construction of the Public Improvements.

Section 6.08. No Independent Obligation to Construct. Notwithstanding anything in this Agreement to the contrary, the Parties expressly agree and acknowledge that the Developer has no obligation whatsoever to construct any of the Public Improvements described in this Agreement separately or independently of the Developer's construction of the Project. Further, Developer's obligations under this Agreement are conditioned on the completion of a commercial intersection opening at the intersection of SH 45 and FM 1626, which intersection will provide access to the Property (the date on which such intersection is open for traffic, the "**45/1626 Intersection Date**"). If the Developer does not construct the Project, the Developer will not be required to construct the Public Improvements and any fiscal security posted by the Developer for the construction of the Public Improvements will be returned to the Developer promptly following Developer's request therefor.

VII. DEFAULT; NOTICE

Section 7.01 Default. Except with regard to Developer's obligation to pay the City's Deficit Costs Bills (for which a 45-day notice and cure period is applicable), no party shall be in default for its failure to perform under this Agreement until notice of the alleged failure to perform has been given (which notice shall set forth in reasonable detail the nature of the alleged failure) and until such party has had a reasonable time to cure the alleged failure (such reasonable time determined based on the nature of the alleged failure, but in no event less than 90 days after written notice of the alleged failure has been given). In order to accommodate Developer's attempts to cure, the City agrees to hold Council meetings as necessary, provided that such meetings shall not be required more often than two times in one month. In addition, no party shall be in default under this Agreement if within the applicable cure period the party to whom notice was given begins performance and thereafter diligently and continuously pursues performance until the alleged failure has been cured.

Section 7.02. Termination Upon Default. Subject to the notice and cure provision of this Agreement, the nondefaulting party shall have the right to terminate this Agreement if the defaulting party has not cured the named default within the cure period; provided that if Developer is the defaulting party and the reimbursement rights of Developer are terminated along with this Agreement as a result of Developer's material default, in no event shall the City not promptly reimburse Developer for Eligible Costs incurred and Public Improvements constructed as of the date of such termination if there are not otherwise disputes regarding such Eligible Costs and construction. In the event of default by Developer, the City may elect but is not obligated to continue collecting sales tax revenues for Public Improvements.

Section 7.03. Notice. Any notice to be given hereunder, including notice of any alleged failure to perform under this Agreement, shall be in writing and shall be deemed given on the earlier to occur of (a) five business days after deposited in the U.S. Mail, Certified Mail, Return Receipt Requested, (b) when delivered by commercial delivery service (e.g., FedEx or UPS) as evidenced by a signed receipt from such delivery service, or (c) when actually received by the party to whom the notice is sent, including receipt by FAX or E-mail. For purposes of this Agreement, notices shall be sent as follows:

If to the City:

City of Hays, Texas
Attn: Public Works Director
P. O. Box 1285
Hays, Texas 78653
With copy to: Mayor, City of Hays

With a copy to:

McKamey Krueger & Knight, LLP
223 W. Anderson Lane, Suite A105
Austin, Texas 78752
Attn: Jeff Ulmann
jeff@mckamiekrueger.com

If to the Developer:

Walters Southwest
1010 W. Martin Luther King Jr., Blvd.
Austin, Texas 78701
Attn: William S. Walters, III
With copy to: Cindy Kohler
bwalters@waltersw.com
ckohler@waltersw.com

With a copy to:

Law Office of Ken Mills
PO Box 49725
Austin, Texas 78765
Attn: Ken Mills
ken@kenmillslaw.com

Section 7.04. Remedies. In the event of a default by either party to this Agreement, the non-defaulting party shall have available all remedies at law or in equity, including, but not limited to, specific performance and mandamus relief, and the defaulting party shall be liable for the non-defaulting party's reasonable attorneys' fees and court costs, if any, incurred in successful enforcement of its rights hereunder.

VIII. ASSIGNMENT

Section 8.01. Developer Assignment of Agreement. Without the City's prior written consent, Developer's rights and obligations under this Agreement may not be assigned by Developer to a third-party non-affiliate prior to the date on which Developer (or the applicant for such service) has received approval of either the WSA from the City of Austin or the Alternate Utility Service pursuant to Section 5.01 of this Agreement; provided that after such approval date, Developer may assign its rights and obligations hereunder, without the City's prior written consent, (i) to one or more purchasers of all or part of the Property, and/or (ii) to an affiliate; provided that no such assignment shall be effective as against the City unless and until Developer sends notice of such assignment and a complete copy of the assignment document to the City. This Agreement shall run with the land. The City may not assign any of its duties, rights, or obligations under this Agreement without the prior written consent of the Developer, which consent shall not be unreasonably withheld or delayed.

Section 8.02. Binding Obligations. This Agreement shall be binding upon the Parties, their successors and assigns.

IX. ADDITIONAL PROVISIONS

Section 9.01. Authorized to Take Action. The City hereby authorizes its city administrator or his delegated staff to take all actions, and finalize and enter into all documents, necessary to accomplish the purposes of this Agreement on behalf of the City, except and to the extent that applicable law requires such action to be taken or document to be entered into by the Mayor and/or following a separate action of the City Council.

Section 9.02. No Moratorium. In consideration of Developer's agreements hereunder, the City agrees that it will not, during the Term of this Agreement, impose or attempt to impose (i) any moratorium on building or development within the Property, or (ii) any land use or development regulation that limits the rate or timing of land use approvals, whether affecting preliminary plats, final plats, site plans, building permits, certificates of occupancy or other necessary approvals, within the Property; provided, however, that the preceding does not apply to temporary moratoriums uniformly imposed throughout the City due to an emergency constituting imminent threat to the public health or safety, provided that such moratorium will continue only during the duration of the emergency.

Section 9.03. Entire Agreement. This Agreement supersedes any and all other prior or contemporaneous agreements or understandings, whether oral or in writing, between the Parties

with respect to the subject matter of this Agreement, and none of such prior or contemporaneous agreements or understandings shall be valid or binding upon the parties hereto.

Section 9.04. Severability. If any provision of this Agreement shall be determined by a court to be invalid or unenforceable for any reason, such invalid or unenforceable provision shall be deleted from this Agreement, and the remaining provisions of this Agreement shall be interpreted and enforced to give effect to the intent of this Agreement as if such invalid or unenforceable provision had never been contained herein.

Section 9.05. Amendment; Contact Person. (a) This Agreement may be amended only with the written consent of the Parties.

(b) Until the sooner of the time that the named "Developer" either (i) sells the last lot or parcel in the Project, or (ii) notifies the City that a new contact has been appointed (e.g., a property owners' association), the party who may make decisions regarding this Agreement for the Developer party (including with regard to any amendments hereto), and the party to which all City notices shall be sent, is the Developer first named above and listed in Sec. 7.03.

Section 9.06. Recordation. This Agreement or a memorandum, summary or other reference to this Agreement may be filed in the deed records of Hays County, Texas.

Section 9.07. Authority. Each party to this Agreement represents and warrants that it has the authority to enter into and perform its duties and obligations under this Agreement and that the individual executing this Agreement on behalf of such party has full authority to do so. In addition, the City represents and warrants that the governing body of the City has approved this Agreement and authorized its execution, and the approval and authorization by the governing body was in accordance with all laws applicable to the City.

Section 9.08 Force Majeure.

(a) The term "force majeure" as employed herein shall mean and refer to acts of God; strikes, lockouts, or other industrial disturbances: acts of public enemies, orders of any kind of the government of the United States, the State of Texas or any civil or military authority; insurrections; riots; epidemic; landslides; lightning, earthquakes; fires, hurricanes; storms, floods; washouts; droughts; arrests; restraint of government and people; civil disturbances; explosions; breakage or accidents to machinery, pipelines, or canals; or other causes not reasonably within the control of the party claiming such inability.

(b) If, by reason of force majeure, any party hereto shall be rendered wholly or partially unable to carry out its obligations under this Agreement, then such party shall give written notice of the full particulars of such force majeure to the other party within 10 days after the occurrence thereof. The obligations of the party giving such notice, to the extent effected by the force majeure, shall be suspended during the continuance of the inability claimed, except as hereinafter provided, but for no longer period, and the party shall endeavor to remove or overcome such inability with all reasonable dispatch.

Section 9.09. Texas Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Texas and shall be performable in Hays County, TexasVenue shall lie exclusively in Hays County, Texas.

Section 9.10. Time is of the Essence. Time is of the essence in the performance of this Agreement.

EXECUTED in multiple originals and effective as of the 3rd day of September 2013.

Attest:

Kathy Davidson
Kathy Davidson
City Secretary

THE CITY OF HAYS, TEXAS

Michael Warn
MICHAEL J. WARNKEN
Mayor

STATE OF TEXAS §

COUNTY OF HAYS §

This instrument was acknowledged before me on Sept. 29th, 2013, by Michael Warn Ken Mayor of the City of Hays, Texas, a Texas general law municipal corporation, on behalf of said municipal corporation.

Notary Public, State of Texas

KATHY DAVIDSON
NOTARY PUBLIC
STATE OF TEXAS
EXPIRES
4-12-2014

LUKERS, INC.,
dba WALTERS SOUTHWEST,
a Texas corporation

William S. Walters, III, President

STATE OF TEXAS §

COUNTY OF TRAVIS §

This instrument was acknowledged before me on September 24 2013, by William S. Walters, III, President of Lukers, Inc., a Texas corporation, on behalf of said corporation.

CINDY GAIL ROBERTSON
Notary Public, State of Texas
My Commission Expires
November 09, 2016

Notary Public-State of Texas

Exhibit "A"

Property Descriptions

"279.4 ACRES, MORE OR LESS, IN THE JOHN G. MCGEEHEE SURVEY NO. 6, AND THE PHILIP J. ALLEN SURVEY NO. 5 IN HAYS COUNTY, TEXAS, BEING A PORTION OF A 499.23 ACRE TRACT OF LAND CONVEYED TO GRAGG INTERESTS, LTD IN A SPECIAL WARRANTY DEED DATED NOVEMBER 01, 1991 AND RECORDED IN VOLUME 899, PAGE 616 OF THE DEED RECORDS OF HAYS COUNTY, TEXAS AND VOLUME 11561, PAGE 1645 OF THE REAL PROPERTY RECORDS OF TRAVIS COUNTY."

"50.29 ACRES, MORE OR LESS, IN THE JOHN G. MCGEEHEE SURVEY NO. 6, AND THE PHILIP J. ALLEN SURVEY NO. 5 IN HAYS COUNTY, TEXAS, BEING A PORTION OF A 499.23 ACRE TRACT OF LAND CONVEYED TO GRAGG INTERESTS, LTD IN A SPECIAL WARRANTY DEED DATED NOVEMBER 01, 1991 AND RECORDED IN VOLUME 899, PAGE 616 OF THE DEED RECORDS OF HAYS COUNTY, TEXAS AND VOLUME 11561, PAGE 1645 OF THE REAL PROPERTY RECORDS OF TRAVIS COUNTY."

EXHIBIT "B"

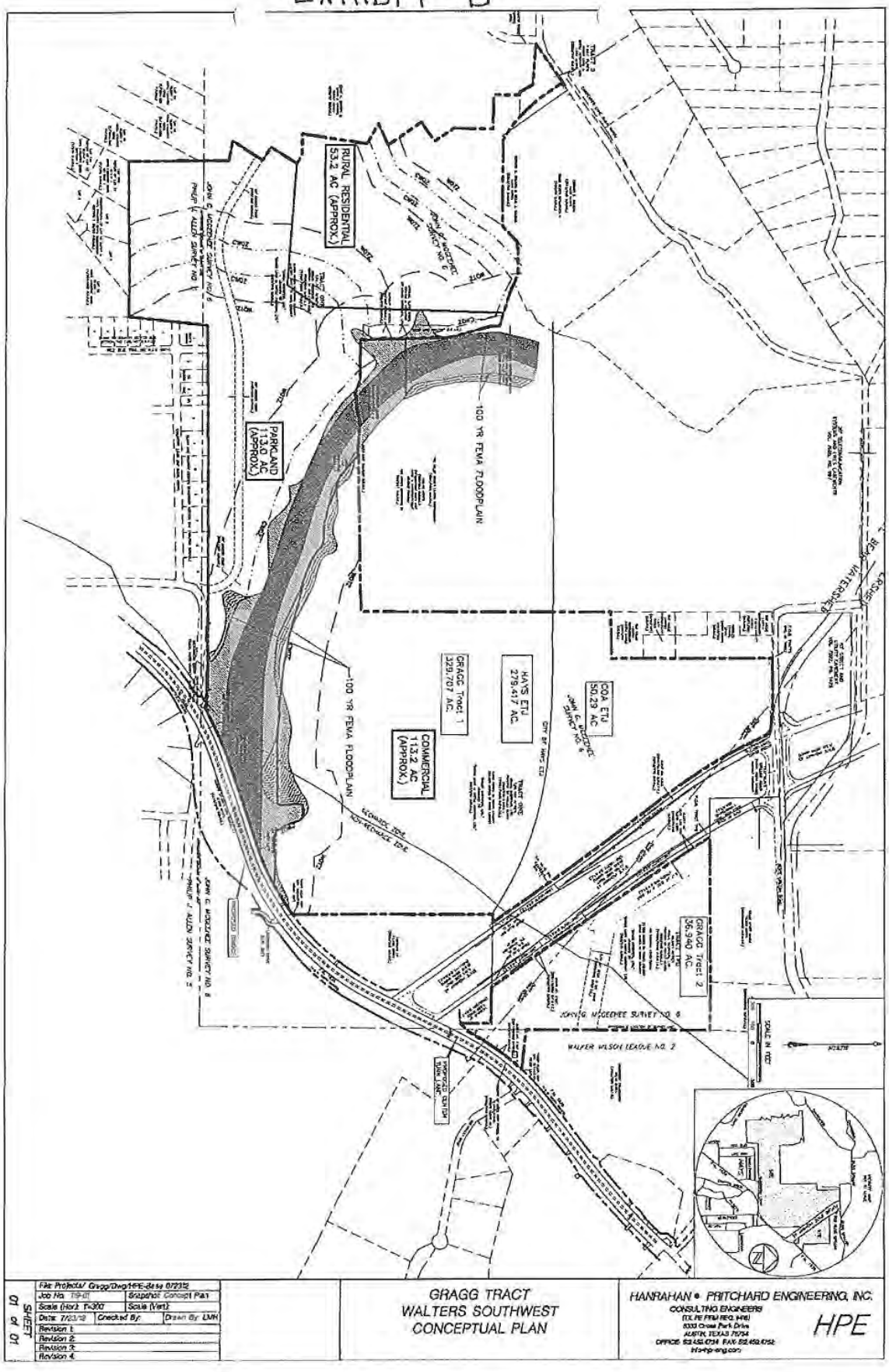

RURAL RESIDENTIAL
53.2 AC (APPROX.)
PARKLAND
113.0 AC
(APPROX.)
100 YR FEMA FLOODPLAIN
100 YR FEMA FLOODPLAIN
GRAGG Tract 1
329.707 AC.
HAYS ETJ
279.417 AC.
COA ETJ
50.29 AC
COMMERCIAL
113.2 AC
(APPROX.)
GRAGG Tract 2
36.940 AC.
JOHN G. MOGEEHEE SURVEY NO. 6
WALKER WILSON LEAGUE NO. 2
SCALE IN FEET
SHEET
01 of 01
File: Projects/ Gragg/Dwg/HPE-Base 072312
Job No. 119-01
Snapshot: Concept Plan
Scale (Hor): 1"=300'
Scale (Vert):
Date: 7/23/12
Checked By:
Drawn By: LMH
Revision 1:
Revision 2:
Revision 3:
Revision 4:
GRAGG TRACT
WALTERS SOUTHWEST
CONCEPTUAL PLAN
HANRAHAN • PRITCHARD ENGINEERING, INC.
CONSULTING ENGINEERS
HPE

Exhibit C
Suggested Plant List

Canopy Trees	
Cedar Elm	Umus crassifolia
Live Oak	Quercas virginiana
Bur Oak	Quercas macrocarpa
Chinquapin Oak	Quercas muhlenbergii
Texas Red Oak	Quercas texana
Ornamental Trees	
Texas Redbud	Cercis canadensis "texensis"
Tree Yaupon	Ilex vomitoria
Possumhaw Holly	Ilex decidua
Texas Mt Laurel	Sophora secundiflora
Wax Myrtle	Myrica cerifera
Mexican Buckeye	Ungnadia speciosa
Shrubs	
Texas Sage	Leucophylum frutescens
Cherry Sage	Lavia greggii
Dwarf Wax Myrtle	Myrica pusilla
Big Muhly	Muhlenbergia lindeimeri
Pine Muhly	M. dubia
Flame Acanthus	Aniscanthus wrightii
Grass/Ground Covers	
Buffalo grass	Buchloe dactyloides
Bermuda grass	Cynodon dactylon
Side Oats Gramma	Bouteloua curtipendula
Little Bluestem	Schizachyrium scopanium
Curly Mesquite	Hilaria berlangeri
Zoysia	Zoysia matrella
Turffalo	

Exhibit D
Lighting and Signage Regulations

Lighting Criteria

1. Exterior lighting shall be designed to minimize glare and light trespass to surrounding neighborhoods. Illumination levels for driveway, parking lot, and security lighting should not exceed 3 foot-candles, average maintained, measured horizontally at finished ground/pavement level. Illumination levels at the boundary of the Property may not exceed 1 foot-candle, except that the foregoing limitation shall not apply to those portions of the Property boundary that adjoin either SH 45 or FM 1626.

2. Exterior lights shall not be permitted to shine directly into the eyes of any occupant of any vehicle on any public or private road, onto adjacent property, or where the illumination interferes with the visibility or readability of any traffic signs or devices. Lighting levels shall conform to Illumination Engineering Society (IES) standards and Federal/State requirements. Commercial lighting other than that necessary for security should be turned off at the later of closing time or 11:00 PM. Lighted commercial signs should be turned off or reduced to half their original illumination after the later of closing time or 11:00 PM.

3. Artificial lighting for parking areas should not exceed the following requirements:

   (a) Free standing light fixtures should not exceed a height of 30 feet measured from the ground/pavement to the bottom base of the fixture.

   (b) Fixture wattage shall not exceed 250 lamp watts.

   (c) Fixtures shall be limited to 2 per pole, shall have no uplight, nor lamps/light-refracting lenses extending below the plane of the lowest point of the fixture housing, and be of an IES controlled distribution of type 2, 3, 4 or 5. Fixtures will provide a cutoff not to exceed 90 degrees from nadir so that light is not emitted above the horizontal plane.

   (d) Building-mounted wall packs shall not exceed a lamp wattage of 200 watts, shall be mounted no higher than 28 feet from the ground/pavement to the bottom of the fixture. Wall packs shall be configured with a full front metal shield with a sharp cutoff of 85 degrees or better to block the lamp source from line of sight view. Open faced wall packs of any wattage or size are prohibited.

   (e) Floodlights, not to exceed a lamp wattage of 100 watts, may be used if ground mounted and shielded/hooded. Other floodlights and dusk to dawn fixtures of any wattage or size are prohibited.

4. Landscaping Lighting.

(a) Landscape lighting such as tree lighting shall be achieved using the "moon lighting" method whereby the light source is located above and not on the ground. Uplighting using flood/well lights is prohibited except as provided in paragraph (b) below. Fixtures shall be no higher than 28 feet measured from the ground to the bottom of the fixture. Fixture wattage shall not exceed 175 lamp watts. Lamps shall be housed in bullet style enclosures with an extending truncated shield to maximize cutoff.

(b) Floodlights, not to exceed a lamp wattage of 100 watts, may be used if ground mounted and shielded/hooded. Other floodlights and dusk to dawn fixtures of any wattage or size are prohibited.

5. Fixture lamps shall be quartz halogen, fluorescent, metal halide, mercury vapor, or high pressure sodium.

Building Signage Criteria

1. Over 13,000 square feet space:

(a) All signs are to be in the form of individual reverse channel letters (backlighting) with translucent plex sign face.

(b) Letter height: If one (1) horizontal line of lettering is used, individual letters shall not to exceed 48 inches in height. A maximum of two (2) lines of lettering may be used provided the maximum height, as measured from the upper most point of the first line to the lower most point of the second line, shall not exceed 48 inches with minimum 4-inch space between letters.

2. Less than 13,000 square feet space:

(a) All signs are to be in the form of individual reverse channel letters (backlighting) with opaque metal sign face.

(b) Letter height: Only one horizontal line of lettering shall be used and letters shall not to exceed 28 inches in height.

3. Letter spread: Not to exceed length of 75% of storefront (Example: a storefront measuring 40 feet can have a sign length not to exceed 30 feet) and centered on the store-front.

4. Sign area: For business occupants with frontage of 66.5 linear feet or less sign area shall not to exceed the following formula: Linear frontage of space minus 4 feet x 2.4.

For business occupants with frontage greater than 66.5 linear feet sign area shall not have an aggregate area exceeding that calculated by multiplying the frontage by two (2) feet and in no event exceeding 150 square feet aggregate total sign area.

Ex. B

Preliminary Staff Review of the Draft Environmental Impact Statement for State Highway 45 Southwest

July 18, 2014

General Statement: On the basis of the staff's preliminary review, it is our collective opinion that the draft Environmental Impact Statement (EIS) is incomplete and deficient in the key information needed to judge whether the findings and conclusions uphold the intent of the Consent Decree. This judgment is based on the following:

1. The 1990 Consent Decree and the specific measures of the consent decree are not mentioned or referenced in the discussion in key sections (e.g., Process Steps, History of Project, etc.).
2. Certain pertinent findings are based on work that is ongoing and incomplete. For example, the EIS references the number of significant karst features that require action while acknowledging that the karst survey and Geologic Assessment (GA) are ongoing with findings pending.
3. Since the GA is not complete and, of course, not included in the EIS, the actual roadway alignment cannot be determined with certainty. This uncertain alignment affects specific design elements related to BMP designs and treatment of sensitive karst which are integral to evaluating the validity of the EIS findings.
4. The draft EIS presents hypothetical discussion of alignment and construction plans with no design-level commitments. The soft language presented and lack of any site specific design/construction information or limitations (e.g., available footprint, site conflicts, slope/gradient conditions, etc.), makes it difficult to perform any analysis needed to support this EIS and conclusions presented. More detail is needed to assess consistency with the consent decree and the guiding principles related to consistency with the "Public Interest" and protection of the aquifer.
5. Certain pertinent findings are based on insufficient or incorrect data. For example, conclusions as to the possible effects on adjacent wells were made using an incomplete inventory of wells in the area (see attached map).

Preliminary Staff Review. The District's technical staff with assistance of our consultant engineer, Don Rauschuber, have completed a preliminary review of the draft EIS for State Highway 45 Southwest. This preliminary review was conducted using the measures of the consent decree as the frame of reference to guide the evaluation. Principle statements from the preamble of the consent decree (see attachment) that guided our review include:

"...ensure highway is constructed in an environmentally sensitive and prudent fashion

"... terms of the Judgment... are designed to protect the aquifer from the potential effects of highway construction and subsequent use... and consistent with the public interest."

It is important to note that these comments represent a high-level description of the staff's preliminary review and are reflective of the status of the review at this point which is ongoing. Staff intends to further develop the comments for the testimony at the public hearing on July 29, 2014 and in the written comments due on August 13th, 2014.

General Comments:

1. The purpose and need statement (PNS) is repeatedly referenced as the primary criteria for alternatives evaluation. The District provided comments to the coordination plan in October of 2013 recommending that in addition to connectivity and mobility, preservation of the Edwards Aquifer should be included as a high-level criterion for evaluation. This was not included, and ostensibly, not a factor in the evaluation.
2. Consent decree states that the BSEACD will have input on how SH 45 will be built, operated, and maintained. There is no reference to this in the EIS.
3. The EIS describes the employment of an *independent* Environmental Compliance Officer (ECO). However, it does not address the ECO tenure. For example: How long will this position be in place? What enforcement or regulatory duties/powers will the ECO have? Post construction inspection and oversight of permanent BMPs? What are the qualifications for the ECO? Who does the ECO answer to?
4. The BSEACD should be added to the Void Discovery Protocol.
5. The well inventory referenced is substantially incomplete. The EIS references 38 wells in the Area of Influence. District records indicate approximately 150 wells (see attached map). This section and any resulting findings should be re-evaluated to consider all the wells that may be affected.
6. Groundwater pumping figures referenced in the document are sourced from sources other than the BSEACD. The figures should be revised to reflect actual pumping data provided by the District.
7. In Section ES.5, "land use," of the executive summary, there is a statement that cites the BSEACD as concluding that there is limited influence on the amount and pace of development of the project. The District has not formally analyzed this factor or come to this conclusion. Further, it appears the effect on the project on induced growth may be underestimated considering the developments that are planned at the termini of the roadway. These developments, which arguably would not have been planned at the proposed intensity without the roadway, appear to be planned in anticipation of the project.

8. The EIS references the inputs of the technical groups convened to inform the project. These groups, however, did not meet enough or have an opportunity to provide any structured input that could have influenced the design or EIS findings.
9. The impervious cover of the project (16.8%) is greater than allowed by the City of Austin SOS ordinance (15%). The project should be re-designed in an effort to comply with the standard for all other new development over the recharge zone.

BMPs and Pollution Prevention Measures:

1. Documents and information that would inform an evaluation of the effectiveness of the EIS measures were not provided for review. For example, the Environmental Compliance Management Plan describing BMP maintenance was not provided and therefore could not be evaluated.
2. Although the EIS provides a good literature review of BMPs, Appendix H Technical Report only suggests or proposes BMP improvements that do not include the best BMP options described in the EIS literature review.
3. The EIS provides a misleading conclusion that the water quality after proposed treatment is better than a no-build scenario or that would otherwise exist if left undisturbed. This principle conclusion is misleading because it references calculated removals of Total Suspended Solids (TSS) without reference to increased presence of dissolved constituents and other pollutants such as heavy metals, petroleum byproducts, and hazardous materials that could affect water quality in the Edwards Aquifer and Barton Springs. Suggest adding a clarifying sentence in Executive Summary on pg. 187; "while reductions in TSS would be substantial, the road would add new pollutants (heavy metals, petroleum byproducts, and hazardous materials) and some level of pollutants could remain after treatment (particularly dissolved pollutants and heavy metals not adsorbed to particles)."
4. Proposed BMP designs presented in Appendix H do not employ the most effective BMPs: The EIS literature review clearly demonstrates that retention and re-irrigation and batch detention has been shown to be most effective for removing highway runoff contaminants.
5. No discussion of proposed speed limits on the roadway. Probability and frequency of accidents increases with speed. Road would need better hazardous material treatment and response plans with increased traffic speeds and increased traffic loadings.
6. There should be a specific commitment to mitigation should the monitoring indicate any water quality/quantity impacts that are anticipated or adequately prevented or treated by the proposed measures.
7. Since the EIS only suggests the construction of possible BMPs, there is no discussion requiring actual site conditions or existing site restrictions, such as available

footprint, right-of-way limitations, slope or gradient, location of karst features that will receive discharge from the BMPs, etc.

8. There is no indication if fuel trucks and other vehicles carrying hazardous material will be allowed on SH 45.
9. The current EIS references the intent to allow fueling of equipment and storage of hazardous materials on the recharge zone. Any equipment fueling or hazardous material storage, even if short-term, should be offsite.

Monitoring:

1. Monitoring Plan. The conclusions of the EIS are based on the assumption that the BMPs will perform as designed and that all roadway runoff will either be treated or prevented from entering the aquifer. The EIS should commit to a monitoring plan that would involve pre-construction baseline monitoring and construction and post-construction to verify the effectiveness of the BMPs. As referenced above, any measured impacts to groundwater should address the commitments for mitigation.
2. The EIS should include the installation of a least two sets with three aquifer monitoring wells per set spaced equally along the north-south alignment of SH 45. One set of monitoring wells should be placed up-slope from SH 45, with the second set situated down-slope of SH 45. Monitor wells should be monitored semi-annually throughout SH 45 design life to evaluate harm to the aquifer and effectiveness of BMPs.
3. The baseline TSS used to measure the 90% removal should be determined using the lesser of the 80 mg/L standard and the actual background TSS levels measured at the site.

Assessment and Protection of Karst Features:

1. The one specific engineering design proposal (i.e., the construction of 2,900 linear feet of retaining wall) for Flint Ridge Cave has significant fatal flaws and is not the BMP to protect this major recharge feature. Other options should be considered including:
    - Grade separation (as referenced in the consent decree). Elevate SH 45 over the entire Flint Ridge Cave drainage basin.
    - Curb and gutter the entire length of SH 45 and convey stormwater runoff and all associated pollutants off of Edwards Aquifer Recharge Zone to the extent practical.
    - Convey all roadway runoff through culverts and pipes rather than soil lined swales and ditches to eliminate potential for infiltration.
2. The concept of diverting water into Flint Ridge Cave from an adjacent area is not well explained and potentially very problematic.

3. Significant features table (p 95). The map doesn't extend south and east enough to cover the full alignment to the boundary of the recharge zone. This table is incomplete since the GA is not complete, nor included in the EIS. In addition, the EIS maps illustrating the location of karst/non-karst features within the Study Area must clearly show the aerial extend of each feature and proposed "No-Build" set-back requirements. Are there maps with more features?
4. The project should have a void mitigation plan to address any voids encountered during excavation, trenching, or boring.

Recommendations:

- Re-evaluate the use of best available BMPs such as the measures used on Wonder World Drive in San Marcos (grade separation over sensitive features, curb and gutter all runoff and route to BMPs). Given the sensitivity of the recharge zone that is bisected by the proposed roadway, aquifer protection and preservation must be project's first and foremost priority.
- Incorporate additional monitoring and mitigation and address unanticipated impacts.
- Based on the timeline provided in the coordination plan (see attachment), the preparation of the draft EIS appears to be a full three months ahead of schedule. Staff recommends withdrawing the draft EIS to allow an updated evaluation using data provide by the incomplete GA and corrected data and information where assumptions used to draw conclusions in this draft were incomplete or inaccurate. The revised draft should also include the recommended monitoring and mitigation.
- The EIS will require substantial modification to address the identified issues and deficiencies. Staff recommends that after the draft has been modified to incorporate the necessary data and studies and has been re-evaluated in light of those findings, the draft EIS should re-released for an additional but separate round of public review and comment.
- The District should reserve any judgment of the validity of the EIS findings and conclusions until a completed document is provided for review.

Proposed State Highway 45
Draft EIS Review
Impacts on Endangered Species

Barton Springs Salamander, photo © JH Gillespie

Submitted to:
Save Our Springs Alliance

by
J.H. Gillespie, Ph.D.
ecologist / endangered species specialist
jhgillespie.wordpress.com
Austin, TX (512) 522-8278

August 2014

Introduction & Summary

A

The proposed State Highway 45 project over the environmentally sensitive Barton Springs segment of the recharge zone of the Edwards Aquifer has the potential to significantly impact at least three endangered species, as well as cave-dwelling fauna in Flint Ridge Cave. These species include the endangered Barton Springs Salamander (*Eurycea sosorum*), the endangered Austin Blind Salamander (*Eurycea waterlooensis*), and the endangered Golden Cheeked Warbler (*Dendroica chrysoparia*). Activities during the construction phase and operation of this the proposed SH45 project present both acute and persistent threats to these species that are not adequately accounted for the TXDOT Draft Environmental Impact Statement (hereafter referred to as the draft EIS).

B

Ross (2014) presents numerous examples of the inadequacies of the draft EIS with respect to water quality and quantity – which will not be repeated here – suffice to say that the author concurs with arguments evidence presented in that report. Specifically, the draft EIS:

- Fails to present or propose specific water quality goals or monitoring procedures.
- Inappropriately designates Total Suspended Solids as the sole water quality parameter to mitigate while ignoring many other pollutants that may be transmitted to the aquifer by a highway project of this magnitude including but not limited to: fuel, PCBs, nutrients from organic sediment containment BMPs, pesticides and herbicides, etc.
- Contains weak and non-committal language about BMPs and mitigation efforts, suggesting such efforts *might* occur. Furthermore, the draft EIS, not provide details of specific types of BMPs to be used or maintenance schedules, which are critical for their successful operation.

C

With respect to considerations for endangered wildlife and habitat destruction, the draft EIS:

- Severely understates the indirect impacts of the proposed project not only in the SH45 Study Area but in endangered species habitat downstream and in the Edwards Aquifer which are integrally connected via surface and groundwater pathways.
- Operates on the unrealistic and irrelevant expectation that wildlife must be found immediately within the state-owned right-of-way to be affected by proposed construction and operational activities. Furthermore, the draft EIS makes the erroneous implication that that sightings should be made in 2014 site visits to be relevant.
- Uses inadequate survey effort to assess habitat quality and presence/absence of endangered species and species of concern in the SH45 Study Area.
- Ignores significant research regarding the effects of increased impervious cover, waterborne contaminants associated with development, construction impacts and construction activities on endangered salamanders and their critical habitat.

Inadequate Survey Effort & Understatement of Indirect Effects

A

The major failure with respect to wildlife impacts is that the draft EIS focuses almost entirely on whether endangered species or species of concern have been found (in 2014) immediately within the boundaries of the state-owned ROW. It fails to account for many direct and indirect effects on wildlife that will occur immediately adjacent to, nearby, downstream from or within the recharge zone of the proposed highway construction and operation. It is both unrealistic and inadequate for the standard of whether or not there will be wildlife impacts or take of endangered species to be dependent solely on whether or not the species have been sighted on the state-owned ROW itself. While there is a cursory discussion of 'edge effects' and indirect effects in Chapters 3 and to a much lesser extent chapter 6, there is a large body of research on the wildlife impacts of highway construction projects that are entirely absent from the draft EIS.

B

Furthermore, the draft EIS provides inadequate field surveys effort to conclude that there will be little long-lasting impact on wildlife (as claimed in Chapters 3 and 6). It is never appropriate to conclude presence or absence of species based on single or a handful of field observations -- especially when those observations are made during times of the year during which you would not expect the target species to be active. When studying rare and endangered species, presence/absence may need to be determined by regular field visits during different environmental conditions. The draft EIS does not provide details of field survey effort, field notes or qualifications of those conducting the field surveys for wildlife. Numerous references to "desktop" and "windshield" surveys of vegetation and wildlife observations are made in the draft EIS document. The document references two site visits that took place in August 2013 and December 2013 but provides no details of these site visits or survey protocol(s) if any were used. The draft EIS states that there were few migratory birds found during these months, which is not surprising given that *these are not months of the year in which you would expect north American migrant activity*. In fact, they are the two months of the year in which one would expect to find the least animal activity due to climatic extremes often encountered in August and December. Furthermore, in reference to potential endangered horned lizard habitat, the draft EIS indicates that while suitable habitat is present in the SH45 study area, neither the lizards nor their prey (seed harvesting ants) were found in a single December 2013 site visit. Survey protocol for these species is not provided and given that both lizards and ants are exothermic, *it is not reasonable to expect that that either should be particularly active during the coldest months of the year*.

C

Texas Natural Diversity Database query information is used in the EIS to determine which species of concern and endangered/threatened species may be present in the SH45 study area. However, this database does not contain all known records of occurrence. In addition, the TXNDD query site specifically states that, "Receiving data from the TXNDD does not constitute a project review. A project review entails TPWD's Wildlife Habitat Assessment (WHAB) Program reviewing environmental documentation for specific projects". *Records from this database alone are insufficient to make claims about whether wildlife will be disturbed by the proposed SH45 project.* The draft EIS also concludes that because Bear Creek was dry during some site visits and wet during others that the SH45 study site does not contain potential habitat for many aquatic species listed in Table 3.8-3. This is inappropriate to assume, as several of those species could be presumed to use Bear Creek as habitat when it is wet.

Golden-Cheeked Warblers

A In a report dated July 2014 by Baer Environmental Consulting for the Water and Wastewater Utility Wildland Conservation Division summarizes endangered Golden-Cheeked Warbler sightings near the Travis/Hays county line and very near the proposed SH45 study area from 2000-2013. There have been 153 sightings of the endangered species in that time, including sightings and territory mapping along Bear Creek on City of Austin Water Quality Protection Lands. Though survey effort was insufficient to detect this species in spring 2014, site visits by the author along Bear Creek in the vicinity of the proposed SH45 ROW indicate a healthy, diverse native juniper-oak woodland with very few introduced or invasive plant species: in-tact and healthy GCWA habitat. As the proposed SH45 ROW will directly cross Bear Creek on WQPL in the vicinity of these endangered bird territories, the project threatens to bisect two large habitat patches which may be not only essential territories for spring breeding, but may also be important migration corridors through which birds reach surrounding habitat in the Balcones Canyonlands Preserve system.

B The SH45 draft EIS cites a report by SWCA dated late May 2014 as reporting no sightings on the state-owned ROW in 2014. Since that report was completed and provided to TXDOT before the end of the GCWA birding season, and since the draft EIS lacks any details of the report or survey protocols (dates, number of site visits, hours of survey effort, time-of-day, transect locations), it is premature to conclude that GCWA are not present from the study area or in the state-owned ROW. Such a determination requires multi-year survey effort with field visits across the breeding season. It is common in studies of endangered species to have to conduct regularly timed surveys throughout the active period of the year (Feb – June for GCWA), sometimes for multiple years to detect the presence of a rare animal. In short, the fact that SWCA did not find birds in spring 2014 in the study area is *not sufficient evidence to conclude the birds are absent* and is *not sufficient evidence to conclude that the proposed SH45 project will have no impact on this species*.

C Site visits by the author to private property along Bear Creek (accessed with permission April 11, 2014) and to the City of Austin's WQPL (accessed with permission June 16, 2014), both along Bliss Spillar Rd. adjacent to Bear Creek and immediately adjacent to the SH45 Study Area indicated healthy juniper-oak woodland habitat suitable for dispersal corridor and territory establishment for GCWA. More survey effort is needed to determine whether the birds use the SH45 Study area specifically (since, as mentioned above, established territories have been mapped in multiple years at very nearby field sites) uses this area for breeding habitat. Whether or not it does, however, does not negate the utility of this area as a dispersal corridor by which the birds may access other preserve lands to reach their annual breeding sites.

Impacts to Salamanders: Impervious Cover

D As detailed stated by Ross (2014, pg 43) EIS does not account for reduction in water quantity due to increased impervious cover over the EARZ. These are the major threats to both endangered salamander species as well as other obligate freshwater spring species in the Edwards Aquifer that would be affected by the proposed SH45. Effects of impervious cover on water quality and quantity as they would affect the endangered

Continued on following page

Continued from previous page

Barton Springs Salamander and Austin Blind Salamander are reviewed in USFWS (2013, pg. ; for references in quoted passages please refer to original document):

> "Bowles et al. (2006, pp. 113, 117–118) examined watershed impervious cover effects on salamanders in central Texas, and found significant reductions in salamander density in watersheds with over 10 percent impervious cover. Coles et al. (2012, pp. 4–5), found a loss of sensitive species due to urbanization and that there was no evidence of a resistance threshold to invertebrates that the salamanders preyed upon. A vast amount of literature indicates that 1 to 2 percent impervious cover can cause aquatic habitat degradation. Bendik (2011a,pp. 5, 12–24, 26, 27) reported statistically significant declines in Jollyville Plateau salamander counts over a 13-year period (1996–2010) at six monitored sites with high impervious cover (18 to 46 percent) compared to two sites with lower (less than 1 percent) impervious cover. These results are consistent with Bowles et al. (2006, p. 111), who found lower densities of Jollyville Plateau salamanders at urbanized sites."

Impacts to Salamanders: Construction

The literature on impacts of construction and development on the two salamander species were reviewed as recently as August 2013 for the USFWS Final Rule to list the Austin Blind Salamander as an Endangered species. All USFWS documents cited herein are available for download at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D033 - status. In that ruling, the USFWS concludes that the best available science indicates that:

USFWS 2012 (proposed rule, pge 50773, available at http://www.gpo.gov/fdsys/pkg/FR-2012-08-22/pdf/2012-19659.pdf):

> "Water quality degradation in salamander habitat has been cited as the top concern in several studies (Chippindale et al. 2000, pp. 36, 40, 43; Bowles et al. 2006, pp. 118–119; O'Donnell et al. 2006, pp. 45–50), because these salamanders spend their entire life cycle in water. All of the species have evolved under natural aquifer conditions both underground and as the water discharges from natural spring outlets. Deviations from that high water quality have detrimental effects on salamander ecology, because the aquatic habitat can be rendered unsuitable for salamanders by changes in water chemistry, quantity, and flow patterns. Substrate modification is also a major concern for the salamander species (COA 2001, pp. 101, 126; Geismar 2005, p. 2; O'Donnell et al. 2006, p. 34). Unobstructed interstitial space (the space between the rocks) is critical to habitat of all four salamander species, because it provides cover from predators and habitat for macroinvertebrate prey items. When the interstitial spaces become compacted or filled with fine sediment, the amount of available foraging habitat and protective cover for salamanders is reduced (Welsh and Ollivier 1998, p. 1,128)."

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USFWS (2012, pg 50744) outlines the serious impacts of development within the watersheds of the two salamander species. USFWS also presents a detailed analysis of the impervious cover in the watersheds of four central Texas *Eurycea* species, which is not referenced at all in the draft EIS.

Impacts to Salamanders: Water Contaminants

A The Draft EIS underestimates the threat to the aquifer and dependent species by toxic spills on roadways. National Response Center's database of incidents of chemical and hazardous materials spills from anthropogenic activities including (but not limited to) automobile or freight traffic accidents, pipelines, intentional dumping, storage tanks and industrial facilities and are likely to be underestimates of the total number of incidents because not all incidents are discovered or reported. The primary function of the NRC (http://www.nrc.uscg.mil/foia.html) – a joint program of the Department of Homeland Security and the United States Coast Guard – is to serve as the sole national point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

B A search of the National Response Center database (accessed 19 October 2012; http://www.nrc.uscg.mil/pls/apex/f?p=109:1:908734227403201) on chemical and hazardous materials spills for Travis County revealed 450 reported incidents involving 146 chemical substances from 1990-2012 (on average 20 incidents per year). Results are displayed in Table 1 below. 147 (32.6%) of these spills directly affected a body of water, the most commonly contaminated medium. Spills that did not directly affect aquatic environments may indirectly do so by contaminating soils or lands that drain to water bodies. The draft EIS does not adequately address how it will contain and mitigate toxic spills of these substances, and the suggested BMPs for Total Suspended Solids are not adequate for containing or removing chemical spills (as discussed extensively in Ross 2014).

C In its proposed rule to list the Austin Blind Salamander as an endangered species, the USFWS (2012, pgs 50778-20779) provides a detailed literature review of the effects of *Contaminants in Stormwater Runoff* on salamanders and their prey (see literature cited of the proposed rule for references in quoted passages).

D USFWS (2012, pg 50778):

> "Both nationally and locally, consistent relationships between impervious cover and water quality degradation through contaminant loading have been documented. In a study of contaminant loads from various land use areas in Austin, stormwater runoff loads were found to increase with increasing impervious cover (COA 1990, pp. 12–14). This study also found that contaminant loading rates of the more urbanized watersheds were higher than those of the small suburban watersheds. Soeur et al. (1995, p. 565) determined that stormwater contaminant loading positively correlated with development intensity in Austin. In a study of 38 small watersheds in the Austin area, 7 different contaminants were found to be positively correlated with impervious cover (COA 2006, p. 35). Using

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> stream data from 1958 to 2007 at 24 Austin-area sites, Glick et al. (2009, p. 9) found that the City of Austin's water quality index had a strong negative correlation with impervious cover."

The draft EIS, in it's sole focus on TSS as a water quality contaminant, does not address standards or attainment goals for other possible chemical contaminants.

Impacts on Salamanders: Sediments from Runoff & Construction

The proposed SH45 suggests that BMPs will remove 90% of TSS, though Ross (2014) provides analyses of how this attainment goal is unlikely to be met given repeated failures of such practices at similar construction sites across Austin. Sedimentation has significant and well-known effects on both salamander physiology and habitat quality.

Figure 1. Sediment accumulating in interstitial spaces between rocks in salamander habitat.

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These threats are also summarized in the USFWS proposed rule to list the Austin Blind Salamander as endangered (2012, pgs 50779-50781):

> "Excessive sediment from stormwater runoff is a threat to salamanders because it can cover habitat, cover substrates, and lead to declines in vegetative abundance and diversity (Geismar 2005, p. 2). Sediments suspended in water can clog gill structures, which impairs breathing of aquatic organisms, and can reduce their ability to avoid predators or locate food sources due to decreased visibility (Schueler 1987, p. 1.5). Excessive deposition of sediment in streams can physically reduce the amount of available habitat and protective cover for aquatic organisms, by filling the interstitial spaces of gravel and rocks. As an example, a California study found that densities of two salamander species were significantly lower in streams that experienced a large infusion of sediment from road construction after a storm event (Welsh and Ollivier 1998, pp. 1,118–1,132). The vulnerability of the salamander species in this California study was attributed to their reliance on interstitial spaces in the

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> streambed habitats (Welsh and Ollivier 1998, p. 1,128). We consider increased sedimentation from impervious cover to be a threat to all four central Texas salamanders, because it fills interstitial spaces, eliminates resting places, and reduces habitat of its prey base (small aquatic invertebrates) (O'Donnell et al. 2006, p. 34)."

Furthermore, declines in Jollyville Plateau Salamander populations have been documented due to increased sedimentation in their habitat due to construction activities higher in the watershed, even though BMPs were also in place on those projects. It is already known that urbanization in the recharge zone of the EA affects salamander habitat at Barton Springs, one of the primary threats to this species.

USFWS (2012, pg 50780):

> "Barton Spring salamander population numbers are adversely affected by high turbidity and sedimentation (COA 1997, p. 13). Sediments discharge through Barton Springs, even during baseflow conditions (not related to a storm event) (Geismar 2005, p. 12). Storms can increase sedimentation rates substantially (Geismar 2005, p. 12). Areas in the immediate vicinity of the spring outflows lack sediment, but the remaining bedrock is sometimes covered with a layer of sediment several inches thick (Geismar 2005, p. 5). Sedimentation is a direct threat for the Austin blind salamander because its habitat in Barton Springs would fill with sediment if it were not for regular maintenance and removal (Geismar 2005, p. 12). Further development in the Barton Creek watershed will most likely be associated with diminished water clarity and a reduction in biodiversity of flora (COA 1997, p. 7)."

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USFWS (2012, pg 50784), on construction activities:

> "Short-term increases in pollutants, particularly sediments, can occur during construction in areas of new development. When vegetation is removed and rain falls on unprotected soils, large discharges of suspended sediments can erode from newly exposed areas, resulting in increased sedimentation in downstream drainage channels (Schueler 1987, pp. 1–4; Turner 2003, p. 24; O'Donnell et al. 2005, p. 15). This increased sedimentation from construction activities has been linked to declines in Jollyville Plateau salamander counts at multiple sites (Turner 2003, p. 24; O'Donnell et al. 2006, p. 34). Cave sites are also impacted by construction, as Testudo Tube Cave (Jollyville Plateau salamander habitat) showed an increase in nickel, calcium, and nitrate/nitrite after nearby road construction (Richter 2009, pp. 6–7). Barton Springs (Austin blind salamander habitat) is also under the threat of pollutant loading due to its proximity to construction activities and location at the downstream side of the watershed (COA 1997, p. 237). The City of Austin (1995, p. 3–11) estimated that construction-related sediment and in-channel erosion accounted for approximately 80 percent of the average annual sediment

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> load in the Barton Springs watershed. In addition, the City of Austin (1995, p. 3–10) estimated that total suspended sediment loads have increased 270 percent over predevelopment loadings within the Barton Springs Segment of the Edwards Aquifer."

Given that (1) the SH45 study area and the state-owned ROW fall directly on top of the Barton Springs Segment of the Edwards Aquifer Recharge Zone, (2) the particular significance of Flint Ridge Cave as a recharge feature, (3) the speed at which recharge water reaches salamander habitat at Barton Springs in as little as two days (Hauwert, 2012 cited in the draft SH45 EIS), and (4) the systematic, demonstrated failure of BMPs to contain sedimentation at the construction sites documented by Ross (2014) *to conclude that the proposed SH45 construction project will have little to no impact on endangered Barton Springs Salamander and endangered Austin Blind Salamander populations is intensely misleading.*

To quote Ross (2014, pg 6):

> "even if the construction project achieves the stated goal of construction-phase controls to remove 90 percent of total suspended sediment, there would still be a 10-fold increase in erosion from about 10,000 pounds per year to 100,000 pounds per year. Potentially significant environmental consequences of this increase in sediment to local karst features, threatened species, to the Barton Springs Edwards Aquifer and to spring flow and habitat are not included in the Draft EIS."

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USFWS (2012, pg 50784) also discusses BMPs that may be required to lessen the impact on salamander populations, including "Monitoring groundwater quality and spring flow, minimizing sediment discharges during construction, developing a groundwater impact contingency plan, locating working shafts in areas where the chance of encountering conduits to salamander springs is reduced, and rerouting conduit flow paths around the shaft if encountered." Yet, very few of these are addressed in the draft EIS. USFWS also provides examples BMP failure to protect aquifer water quality and quantity, even when they are in place. Therefore, *the few BMPs mentioned in this draft EIS are not specific enough nor are sufficient to conclude that no take of listed salamanders will occur.*

USFWS (2012, pg 50745, Table 1) indicates that the two salamander species in Barton Springs already face 12% impervious cover across their surface watershed. *Therefore, it is imperative that impacts from the proposed SH45 project be considered in the context of cumulative effects across the recharge zone of the aquifer.* As we already know that salamander populations can be negatively impacted at 10% impervious cover, any additional impervious cover from the proposed SH45 project will only compound these effects and should not be considered in isolation. There is also large and accepted literature on the effects of pollutants and deterioration of water quality on sensitive macroinvertebrate species as well as on aquatic amphibians. USFWS (2012, pgs 50781-50782) cites just a small sampling of the available literature on the effects of pollutants on the physiology and indirect effects of urbanization on aquatic macroinvertebrates and amphibians. In almost all cases, there are synergistic and indirect negative effects on these species that may not have one single direct cause. There is no ecological requirement that any stressor (be it a predator, a pollutant or a

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change in the invertebrate community) must be direct to threaten the stability or long-term persistence of a population or species. Indirect effects can be just as important, especially when many are combined.

References

Ross, LE. 2014. State Highway 45 Southwest Draft Environmental Impact Statement Review. Prepared for Save Our Springs Alliance. Austin, TX.

USFWS. 2012. Endangered and Threatened Wildlife and Plants; Endangered Status for Four Central Texas Salamanders and Designation of Critical Habitat. Federal Register Vol 77 No. 163 pgs 50768-50854.

USFWS 2013. Endangered and Threatened Wildlife and Plants; Determination of Endangered Species Status for the Austin Blind Salamander and Threatened Species Status for the Jollyville Plateau Salamander Throughout Their Ranges. Federal Register Vol 78 No 161 pgs 51278-51326.

Table 1. Accident/Spills Reported to National Response Center's Database for Spills and Accidents for Travis County, TX 1990-2012.

SUBSTANCE	AIR	LAND	SOIL	SUBSURFACE	WATER
"ISO TOX"	1				
134A (NEW REFRIGERANT)	1				
ACETONE			1		
ACID			1		
ACID WASTEWATER		1			
ACIDIC WASTE WATER		1			
AFFF		1			
ALGICIDE	1				
AMMONIA ETCH	1				
AMMONIA, anhydrous	6				2
ANTI-FREEZE		1			
ANTIFREEZE		1			
ASBESTOS	1				
ASPHALT					1
BATTERIES					1
BATTERY (LARGE INDUSTRIAL TYPE)					1
BATTERY ACID		1			
BENDMYL	1				
BENDOMYL	1				
BETASAN	1				
CARBON MONOXIDE			1		
CASORON	1				
CHLORINE	1				
CHLORINE - GAS	1				
CHLORINE GAS	1				
CHLOROFLOUROCARBONS	1				
CHLOROFORM	1	1			
CLARIFIER	1				
COPPER CHLORIDE (ic)				1	
CREOSOTE					1
CUPRIC CHLORIDE		1			
CUPRIC CHLORIDE SOLUTION		1			
DIAZINON	1				
DIBASIC ACID SOLUTION MIXED WITH WATER					1
DIELECTRIC FLUID/LOW LEVEL PCB		1			
DIESEL FUEL		1			
DOLOMITIC QUICK LIME					1
DRY ACID GRANUALS	1				
DURSBAN	1				
ETHYLENE GLYCOL	2	1			

SUBSTANCE	AIR	LAND	SOIL	SUBSURFACE	WATER
ETHYLENE OXIDE	1				
F006 SLUDGE CONTAMINATED MATERIAL		1			
FIRE ANT KILLER		1			
FORM RELEASE COMPOUND					1
FORMALDEHYDE SOLUTION (37 PERCENT SOL.)					1
FREON	2				
GASOLINE VAPORS	1				
GASOLINE: AUTOMOTIVE (4.23G PB/G		2		1	1
GASOLINE: AUTOMOTIVE (UNLEADED)		8	1		12
GASOLINE: AUTOMOTIVE UNLEADED		1			1
GEAR OIL					1
GREASY WATER		1			
HEAVY METAL SLUDGE		1			
HELICOPTER FUEL					1
HYDRAULIC OIL		1			9
HYDROCARBON					1
HYDROCARBON FLUIDS		1			
HYDROCHLORIC ACID	1	1	1		
HYDROCHLORIC ACID OR CUPRIC CHLORIDE 20%		1			
HYDROCHLORIC ACID-37%		1			
HYDROFLUORIC ACID		1			
ISOPROPYL ALCOHOL		1			
JET FUEL: JP-4		2			
JET FUEL: JP-5 (KEROSENE, HEAVY)	1				1
JET FUEL: JP-8		3			3
JET FUEL: JP-8 (JET A)		1			
LEAD		1			
LEAD ACID BATTERIES					1
LIME		1			
LIQUID AMMONIA WITH LIQUID BLEACH					1
LIQUID EDGER	1				
MERCURY		3			
METHYL ALCOHOL (15 PERCENT SOL.)					1
METHYL ETHYL KETONE (PEROXIDE)			1		
MURATIC ACID					1
N-BUTYL ETHER		1			
NA3082 METAL PLATING WATER		1			
NATURAL GAS	16	1			1
NICKLE			1		
NO. 5 FUEL/OIL		1			

SUBSTANCE	AIR	LAND	SOIL	SUBSURFACE	WATER
OIL LIKE SUBSTANCE					1
OIL, EDIBLE: VEGETABLE					1
OIL, FUEL: NO. 1-D		1			1
OIL, FUEL: NO. 2		1		2	1
OIL, FUEL: NO. 2-D		4			9
OIL, FUEL: NO. 5		2			
OIL, MINERAL PCB CONTAMINATED		1			
OIL, MISC: LUBRICATING		2			10
OIL, MISC: MINERAL		4			7
OIL, MISC: MOTOR		14	2	1	10
OIL, MISC: TRANSFORMER	1	2			3
OIL: CRUDE		1			
OIL: DIESEL		8	2		10
ORTHENEX	1				
ORTHO-KLOR	1				
ORTHOCID	1				
OTHER OIL		1			3
OTHER OIL - TURBINE OIL					1
OTHER OIL (GEAR OIL 80-90 WEIGHT)					1
OXYDIZER	1				
PAINT		1			1
PESTISIDE "MALATHION"	1				
PESTISIDE "ORTHENE"	1				
PHEMALDEHYDE		1			
PHENOL		1			
POLYCHLORINATED BIPHENYLS		4			4
POLYCHLORINATED BIPHENYLS (10.7PPM)		1			
POOL SHOCK TREATMENT	1				
PROPANE	1				
PROPYLENE OXIDE					1
RAW SEWAGE					1
REFRIGERANT GASES	10				
SANDY PACK POWDER SOLUTION					1
SANI PAC SP 73000		1			
SAVIN	1				
SEWAGE		3			2
SODIUM			1		
SODIUM HYPOCHLORITE (15% OR LESS			1		
SODIUM HYPOCHLORITE 12.5		1			
STYRENE			1		
SULFURIC ACID		1	1		3

SUBSTANCE	AIR	LAND	SOIL	SUBSURFACE	WATER
TETRACHLOROETHYLENE		1			
TETROLITE(15% METHYL ALC, 70%QUARTERNARY AM CL)					1
TRANSMISSION FLUID		1			
TRETARY BUTYL PHENLO		1			
TRIMETHYLAMINE	1				
TRIOX	1				
UNKNOWN CHEMICALS					1
UNKNOWN MATERIAL	6	3			6
UNKNOWN MATERIAL (CHEMICAL DYE?)					1
UNKNOWN MATERIAL (GREEN)					1
UNKNOWN OIL		5			16
VAPAM	1				
VEGATABLE OIL					1
VEGETABLE OIL					1
WASTE		1			
WASTE CORROSIVE ACID		1			
WASTE OIL		4			2
WASTE POSITIVE PHOTO RESIST		1			
WASTE WATER					1
WASTE WATER SLUDGE		1			
WEED-B-GONE	1				
(blank)		3			
Grand Total	**79**	**126**	**15**	**5**	**147**

J. HAYLEY GILLESPIE

Curriculum Vitae

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Education

2011	University of Texas at Austin (PhD), Ecology, Evolution & Behavior Dissertation title: *The ecology of the endangered Barton Springs salamander (Eurycea sosorum)*
2005	University of Utah, coursework in stable isotope ecology (Salt Lake City, UT)
2003	Austin College (BA), Biology, Environmental Studies & Art (Sherman, TX)

Experience

2012-present,	*Owner/Director*, Art.Science.Gallery. LLC (Austin, TX)
Fall 2013	*Science Literacy Science-Art Resident / Visiting Professor*, Skidmore College (Saratoga Springs, NY)
Spring 2013	*Visiting Assistant Professor of Biology* (*Field Ecology + Natural History* course), Southwestern University (Georgetown, TX)
2011-present	*Founder, EuryceA*lliance, an interdisciplinary working group of central Texas *Eurycea* salamander researchers and natural resource managers. www.eurycealliance.org
2005-2013	*On-Call Environmental Scientist (Research Scuba Diver),* Salamander Conservation Program, City of Austin, Watershed Protection Department (Austin, TX)
2010-2011	*Graduate Research Assistant*, PI: C. Parmesan, University of Texas at Austin (Austin, TX) Project Title: *Quantifying ecosystem integrity under climate change using meta-analysis.*
Summer 2010	*Pre-Doctoral Fellow*, Department of Biology, Texas State University (San Marcos, TX)
2008-2010	*Teaching Assistantships for 13 courses in Conservation Biology, Field Ecology and Introductory Biology for Majors,* University of Texas at Austin (Austin, TX)
2009	*Graduate Mentor*, National Science Foundation Research Experience for Undergraduates (REU) Program, Environmental Science Institute, University of Texas at Austin
2007	*Graduate Mentor*, Intellectual Entrepreneurship Pre-Graduate School Internship, UT Austin
2003-2004	*Middle School Science Teacher,* St. Alcuin Montessori School (Dallas, TX)

Selected Publications & Reports

Gillespie JH. 2013. Application Of Stable Isotope Analysis To Study Temporal Changes In Foraging Ecology In A Highly Endangered Amphibian. *PLoS ONE* 8(1): e53041 doi:10.1371/journal.pone.0053041

Gillespie JH. 2011. *The ecology of the endangered Barton Springs salamander (Eurycea sosorum)*. PhD Dissertation. Austin, Texas: University of Texas at Austin. 154pp.

Gillespie JH. 2011. *Foraging ecology and dietary variation in the Barton Springs Salamander (Eurycea sosorum): an application of stable isotope analysis to conservation of endangered species*. Final report for the Barton Springs Salamander Conservation Fund. Austin, Texas: Austin Community Foundation & City of Austin, Texas.

Goldsmith S, Gillespie H and Weatherby C. 2007. Restoration of Hawaiian montane wet forest: endemic longhorned beetles (Cerambycidae: Plagithmysus) in koa (Fabaceae: Acacia koa) plantations and in intact forest. *The Southwestern Naturalist* 52: 356–363.

Schulze PC, Gillespie JH, Womble R and Silen A. 2006. The effect of suspended sediments on Lake Texoma *Daphnia*: Field distributions and in-situ incubations. *Freshwater Biology* 51: 1447-1457

Additional Manuscripts In Preparation

Gillespie H**,** Parmesan C. *In prep.* Differential use of visual, bioelectric and olfactory predatory cues by an endangered amphibian. (Dissertation Ch. 4)

Gillespie H, Parmesan C, Dries L. *In prep*. Dynamics of four populations of Barton Springs Salamander (*Eurycea sosorum*) in response to environmental variables. (Dissertation Ch. 2)

Gillespie H, Epp K, Davis DR, Gabor C. *In Prep.* Comparison of responsiveness of two species of neotenic *Eurycea* salamanders in laboratory behavioral trials: recommendations for future studies.

Gillespie H, Davis DR, Konovalova E. *In Prep*. A comparison of Hess-type and Dendy-type benthic samplers to estimate aquatic invertebrate population dynamics in headwater springs.

Gillespie H, Bartholomew T, Konovalova E, Stein R, Amoako K. *In Prep*. The role of autotrophic and heterotrophic respiration in nutrient-enriched light-abundant vs. light-limited headwater springs.

Selected Honors & Awards

Recipient of over $40,000 in scientific grants and awards for research on Texas Salamanders and freshwater springs.

2011-2012	Texas Ecolab Grants for research on private lands
2011	College of Natural Sciences Outreach Innovation Award (co-awardee) for *Science Under The Stars* public outreach lecture series, Brackenridge Field Laboratory, University of Texas at Austin
2004-2010	Research Fellowships at the University of Texas: Bee Cave Ecology Endowment Award, Terrell H. Hamilton Endowed Graduate Fellowship Zoology Scholarship Endowment for Excellence, Dorothea Bennett Memorial Graduate Fellowship
2009	Barton Springs Salamander Conservation Fund Research Grant, City of Austin & Austin Community Foundation
2008	Howard McCarley Student Research Award, Southwestern Association of Naturalists
2005	Sigma Xi Grant-in-Aid of Research

Selected Scientific Presentations

Delivered over 24 presentations, workshops and posters at scientific meetings and public outreach events.

2012	2nd Meeting of the *Eurycea*lliance Working Group, *Differential use of visual, bioelectric and olfactory predatory cues by an endangered amphibian*. (San Marcos, TX).
2012	59th Annual Meeting of the Southwestern Association of Naturalists, Plenary Session/Wilks Award Finalist, *Differential use of visual, bioelectric and olfactory predatory cues by an endangered amphibian.* (Valle de Bravo, Mexico)
2011	96th Meeting of the Ecological Society of America, *Application of time-series and multiple regression techniques to assess population variability in two populations of the endangered Barton Springs Salamander (Eurycea sosorum).* (Austin, TX)
2011	1st Meeting of the *Eurycea*lliance Working Group, *Conservation Implications of Understanding Population Dynamics in the Barton Springs Salamander.* Texas State University (San Marcos, TX)
2010	7th International Conference on Applications of Stable Isotope Techniques to Ecological Studies, *Temporal and individual diet in the Barton Springs salamander: an application of stable isotope analysis to conservation of endangered species.* University of Fairbanks (Fairbanks, AK)
2009	Southwestern University. *The ecology of Texas salamanders.* (Georgetown, TX)

2007 Texas Herpetological Society Symposium on Texas Salamanders. *Assessing temporal diet variation in the Barton Springs Salamander (*Eurycea sosorum*) using stable isotope techniques.* University of Texas at Austin, J.J. Pickle Research Campus (Austin, TX)

2006 53rd Annual Meeting of the Southwestern Association of Naturalists. *Use of stable isotopes to investigate resource use and predation in central Texas aquatic salamanders*. Universidad de Colima (Colima City, Colima, Mexico)

2009 94th Annual Meeting of the Ecological Society of America. (Albuquerque, NM) *Individual and seasonal variation in the diet of the Barton Springs salamander* (Eurycea sosorum).

2008 6th International Conference on Applications of Stable Isotope Techniques to Ecological Studies. *Temporal and individual diet in the Barton Springs salamander: an application of stable isotope analysis to conservation of endangered species*. University of Hawai'i (Honolulu, HI)

Public Outreach

2009-present *Co-Organizer*, *Science Under The Stars* public outreach lecture series. Brackenridge Field Laboratory, University of Texas at Austin (Austin, TX)

2012 *Darwin Day Portrait Project*, 203rd Darwin Day at the Texas Memorial Museum (Austin, TX)

2011 *Field Trip Leader* "*Ecology & Conservation Of The Endangered Barton Springs Salamander*." 96th Annual Meeting of the Ecological Society of America (Austin, TX)

2011 College of Natural Sciences Outreach Innovation Award (co-awardee) for *Science Under The Stars* public outreach lecture series, Brackenridge Field Laboratory, University of Texas at Austin

2010 Outreach Lecture: *The Texas Salamanders*, Austin Herpetological Society. (Austin, TX)

2009 Outreach Lecture: *Texas Salamander Extravaganza, Science Under The Stars* public lecture series. University of Texas at Austin, Brackenridge Field Laboratory (Austin, TX)

2009 *Director*, Trash-Fest cleanup event, Brackenridge Field Laboratory (Austin, Texas)

2009 *Co-Director,* Eco-Photo Festival. 94th Annual Meeting of the Ecological Society of America, ESA Student Section (Albuquerque, NM)

2008-2010 *Outreach Tour Leader* (for K-12 school groups), Barton Springs (Austin, TX)

2008-2010 *Science Fair Judge*, Forest Trail Elementary School (Austin, TX)

Memberships

Officer and member of eight scientific organizations.

Southwestern Association of Naturalists (Secretary), *EuryceA*lliance Working Group (Founder, *eurycealliance.org*), Texas Academy of Science, Society for Conservation Biology, Ecological Society of America, American Society of Ichthyology & Herpetology, Natural History Network, National Association of Science Writers.

Professional & Community Service

2012-2013 Peer-Reviewer on proposed rules to list four Eurycea salamander species as endangered, USFWS

2012 *Volunteer,* Travis County Natural Resources, biological surveys for endangered Black-Capped Vireo and Golden-Cheeked Warblers

2011-2013 *Volunteer*, Texas Natural History Collections, Fishes of Texas Project

2011-2013 *Secretary*, Southwestern Association of Naturalists

2010-2011 *Board of Governors*, Southwestern Association of Naturalists

Bryan W. Shaw, Ph.D., *Chairman*
Toby Baker, *Commissioner*
Zak Covar *Commissioner*
Richard Hyde, P.E., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 28, 2014

Doug Boeher
Deputy Director, Environmental Affairs
Texas Department of Transportation
125 East 11th Street
Austin, TX 78701

Re: TCEQ Grant and Texas Review and Comment System (TRACS) #2014-308, SH 45 Southeast Project, City of Austin, Travis and Hays Counties.

Dear Mr. Boeher:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers the following comments:

We are in support of the project. The environmental assessment addresses issues related to surface and groundwater quality.

Any debris or waste disposal should be at an appropriately authorized disposal facility. If the facility intends to store hazardous waste for more than 90 days, they need to coordinate with our Waste Permits Division to seek authorization prior to storage.

Thank you for the opportunity to review this project. If you have any questions, please contact Ms. Elizabeth McKeefer at (512) 239-1786 or Elizabeth.McKeefer@tceq.texas.gov.

Sincerely,

Steve Hagle, P.E., Deputy Director
Office of Air

CivilE

T.X.D.O.T.
RECEIVED
JUL 30 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

PRINCIPALS:
LAWRENCE M. HANRAHAN, P.E.
ANDY CARTER, P.E.

July 25, 2014

CE 13004

Mr. Lucas Short, P.E.
TxDOT Austin District – Project Manager
7901 N. IH-35
Austin, Texas 78753

T.X.D.O.T.
Received
AUG 01 2014
District 14-Central Design
Austin, TX

Mr. Carlos Swonke, P.G.
TxDOT Environmental Affairs Division - Director
125 E. 11th Street
Austin, Texas 78701-2483

RE: State Highway (SH) 45 Southwest
Schematic Design
Notice of Formal Objection

Gentlemen:

On behalf of Gragg Tract, LP, a Texas limited partnership, we wish to formally object to the absence of frontage roads for SH 45 between FM 1626 and Bliss Spillar Road, as shown in "SH 45SW Schematic Design"(dated 4/22/2014). Gragg Tract, LP is successor by deed to land (the "land") referenced in the attached Deed for Controlled Access Highway Facility ("Deed") as "Gragg Interests, Ltd.; Doc. No. 91098677; Called 499.23 acres".

The Deed establishes areas within which "access to the expressway lanes to be construed in conjunction with the highway facility" shall be permitted (Page 2, Paragraph A), and that "access from Grantors' remaining property to said highway facility shall be governed henceforth as indicated in Paragraphs (A) and/or (B)…" (Paragraph B defines areas wherein access is denied to the expressway lanes from Grantor's property).

Without frontage roads, no safe access to the expressway lanes is feasible from the land, especially if the expressway lanes are to be tolled as planned. Without a frontage road, the Texas Department of Transportation is effectively denying access to the land, contravening those rights of access granted under Paragraph (A) of the Deed. Therefore, we request that frontage roads be shown on the "Build Alternative Draft Schematic" of SH 45 to conform with the terms of the Deed.

Sincerely,

Lawrence M. Hanrahan, P.E.
Principal
CIVILE, L.L.C
TPBE # F-15581

Attachment: Deed for Controlled Access Highway Facility (Doc. No. 201105272, OPRTCT)

CIVILE, L.L.C.
WWW.CIVILETEXAS.COM
TEXAS REGISTERED ENGINEERING FIRM #15581
8240 NORTH MOPAC EXPRESSWAY, SUITE 125
AUSTIN, TX 78759
T: 512.402.6878
F: 512.402.6947

CL 98030351 11

Texas Department of Transportation
Form D-15-12 (Partial Taking)
Page 1 of 4 Rev 9/91

Grantee's mailing address is:
P.O. Drawer 15426
Austin, Texas 78761-5426

11
RC

DEED

Controlled Access Highway Facility

THE STATE OF TEXAS)
COUNTIES)
~~COUNTY~~ OF Travis and Hays)

TRV 2001105272
11 pgs

WHEREAS, the Texas Transportation Commission has been authorized under House Bill 179, Acts of the 55th Legislature, Regular Session, 1957 (Article 6674w-1, et seq., Vernon's Annotated Civil Statutes of Texas) to purchase land and such other property rights deemed necessary for the purposes of facilitating the construction, maintenance and operation of Controlled Access Highways; and,

WHEREAS, the purchase of the hereinafter-described premises has been deemed necessary by the Texas Transportation Commission for the purposes of facilitating the construction, maintenance and operation of a Controlled Access Highway facility;

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS:

That, Gragg Land & Cattle Co., Ltd

of the ~~County~~ Counties of Travis and Hays, State of Texas, hereinafter referred to as Grantors, whether one or more, for and in consideration of the sum of Two Hundred and Sixty one thousand, Six hundred thirty five Dollars ($261,635.00) to Grantors in hand paid by the State of Texas, acting by and through the Texas Transportation Commission, receipt of which is hereby acknowledged, and for which no lien is retained, either expressed or implied, have this day Sold and by these presents do Grant, Bargain, Sell and Convey unto the State of Texas all that certain tract or parcel of land lying and being situated in the ~~County~~ Counties of Travis and Hays, State of Texas, more particularly described in Exhibit "A," which is attached hereto and incorporated herein for any and all purposes.

SAVE and **EXCEPT, HOWEVER,** it is expressly understood and agreed that Grantors are retaining title to the following improvements located on the property described in said Exhibit "A," to wit:

NA

Grantors covenant and agree to remove the above-described improvements from said land by the _____ day of NA, 19____, subject, however, to such extensions of time as may be granted by the State in writing; and if, for any reason, Grantors fail or refuse to remove same within said period of time prescribed, then, without any further consideration, the title to all or any part of such improvements not so removed shall pass to and vest in the State of Texas forever.

Grantors reserve all of the oil, gas and sulphur in and under the land herein conveyed but waive all rights of ingress and egress to the surface thereof for the purpose of exploring, developing, mining or drilling for same; however, nothing in this reservation shall affect the title and rights of the State to take and use all other minerals and materials thereon, therein and thereunder.

SH 45 PARCEL 2

TRAVIS COUNTY

Unofficial Copy

Grantors hereby acknowledge that their use of and access to the expressway lanes to be constructed in conjunction with the highway facility of which the land hereby conveyed shall become a part, shall be and forever remain subject to the same regulation by legally constituted authority as applies to the public's use thereof; and Grantors further acknowledge that the design and operation of such highway facility as a Controlled Access Highway require that access from Grantors' remaining property to said highway facility shall be governed henceforth as indicated in Paragraphs (A) and/or (B) hereinbelow, and all abutter's rights, including rights of ingress and egress and the right of direct access to and from Grantors' remaining property to said Controlled Access Highway facility, which have accrued or might otherwise accrue to Grantors, their heirs, successors or assigns are hereby waived, released and relinquished insofar as they appertain to Paragraph (B) hereinbelow:

A. ACCESS TO AND FROM GRANTOR'S REMAINING PROPERTY WILL BE PERMITTED:

To the east remainder abutting the highway facility between a point being the beginning of the third call, and a point being 171 771 meters (563 55 feet) S 37° 07' 55" E of the beginning of the fourth call, and the east remainder abutting the highway facility between a point being 291 771meters (957 25 feet) S 37° 07' 55" E of the beginning of the fourth call, and a point being the ending of the fourth call, and the west remainder abutting the highway facility between a point being 9 196 meters (30 170 feet) (arc length) of the beginning of the seventh call (being a curve with a radius of 3481 173 meters (11421 15 feet), a chord bearing of N 38° 10' 13" W a distance of 126 252 meters (414 21 feet)), and a point being 270 166 meters (886 37 feet) (arc length), of the beginning of the ninth call (being a curve with a radius of 1184 412 meters (3885 86 feet), a chord bearing of N 33° 32' 21" a distance of 284 478 meters (933 32 feet))

B. ACCESS TO AND FROM GRANTOR'S REMAINING PROPERTY WILL BE DENIED:

To the east remainder abutting the highway facility between a point being 171 771 meters (563 55 feet) S 37° 07' 55" E of the beginning of the fourth call, and a point being 291 773 meters (957 26 feet) of the beginning of the fourth call, and the west remainder abutting the highway facility between a point being the beginning of the sixth call, and a point being 9 196 meters (30 170 feet) (arc length) of the beginning of the seventh call (being a curve with a radius of 3481 173 meters (11421 15 feet), a chord bearing of N 83° 10' 13" a distance of 126 252 meters (414 21 feet)), and the west remainder abutting the highway facility between a point being 270 166 meters (886 37 feet) (arc length), of the ninth call (being a curve with a radius of 1184 412 meters (3885 86 feet), a chord bearing of N 33° 32' 21" W a distance of 284 478 meters (933 32 feet)), and a point being the ending of the eleventh call

Unofficial Copy

O JOBS\98224-35\Parcel 2 doc

Texas Department of Transportation
Form D-15-12 (Partial Taking)
Page 3 of 4 Rev. 9/91

TO HAVE AND TO HOLD the premises herein described and herein conveyed together with all and singular the rights and appurtenances thereto in any wise belonging unto the State of Texas and its assigns forever; and Grantors do hereby bind ourselves, our heirs, executors, administrators, successors and assigns to Warrant and Forever Defend all and singular the said premises herein conveyed unto the State of Texas and its assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof.

IN WITNESS WHEREOF, this instrument is executed on this the 21 day of [signature] XXX 2001

Gragg Land & Cattle Co., Ltd.

By: [signature]
Billy H. Gragg
Managing Partner

****

ACKNOWLEDGMENT

~~THE STATE OF TEXAS,~~ }
COUNTY OF _____ }

BEFORE ME, the undersigned, a Notary Public, on this day personally appeared _____, known to me (or proved to me on the oath of _____, a credible witness,) to be the person(s) whose name(s) is (are) subscribed to the foregoing instrument and acknowledged to me that he/she/they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this _____ day of _____, 19____.

_____
Notary Public, State of Texas

My Commission expires on the _____ day of _____, 19____.

****

CORPORATE ACKNOWLEDGMENT

THE STATE OF TEXAS, }
~~COUNTY~~ OF Travis ~~and Hays~~ }
COUNTIES

BEFORE ME, the undersigned, a Notary Public, on this day personally appeared Billy H. Gragg _____ of Gragg Land & Cattle Co., Ltd, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the said Gragg Land & Cattle Co., Ltd. ~~a corporation~~ limited partnership, that he/~~she~~ was duly authorized to perform the same by appropriate resolution of the board of directors of such ~~corporation~~ limited partnership and that he/~~she~~ executed the same as the act of such ~~corporation~~ limited partnership for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 21 day of [signature], XX 2001.

TRACY D MILLER
Notary Public, State of Texas
My Commission Expires
AUG. 26, 2003

[signature]
Notary Public, State of Texas

My Commission expires on the 26 day of August, ~~19~~ XX 2003

Unofficial Copy

Texas Department of Transportation
Form D-15-12 (Partial Taking)
Page 4 of 4 Rev 9/91

After recording please return this instrument to:

Travis County, Texas

c/o Transportation and

Natural Resources Dept.

P.O. Box 1748

Austin, TX 78767

Attn: Joanna M. Thompson

RETURN TO:
TEXAS DEPARTMENT OF TRANSPORTATION
P. O. DRAWER 15426 NEAS
AUSTIN, TX 78761-5426
ATTN: DIST. RIGHT OF WAY

Parcel No. 2

County Travis & Hays
Highway No. SH 45 South
Control ____ Sec. ____ Job ____
Account or Federal No. ____
From: FM 1626 to Bliss Spillar Rd.
To: ____

DEED

Controlled Access Highway Facility

Gragg Land & Cattle Co., Ltd
Grantors

TO

THE STATE OF TEXAS
AUSTIN, TEXAS

Filed for Record
This ____ day of ____, ____,
A.D. 19__, at ____ o'clock ____M.

Recorded
This ____ day of ____, ____,
A.D. 19__, in
County, Texas, Records of Deeds,
Book ____ Page ____
Other ____

____ County Clerk
By ____ Deputy

Unofficial Copy

CERTIFICATE OF RECORDING

THE STATE OF TEXAS, }
COUNTY OF Travis and Hays }

EXHIBIT A

PAGE 1 OF 6 PAGES

(Page 1 of 3)

EXHIBIT A

County.	Hays/Travis
Parcel No .	2
Highway	State Highway 45
Limits.	From Farm to Market Road 1626
	To Loop 1
CSJ.	1200-06-004

Fee Simple
Right-of-Way Acquisition

FIELD NOTE DESCRIPTION FOR PARCEL 2

DESCRIPTION OF A 9 6254 HECTARE (23 785 ACRE) TRACT OF LAND LOCATED IN THE JOHN G McGEEHEE SURVEY NO 6, IN HAYS AND TRAVIS COUNTIES, TEXAS, BEING 6 0235 HECTARE (14 885 ACRE) IN HAYS COUNTY, AND 3 6019 HECTARE (8 900 ACRE) IN TRAVIS COUNTY, AND BEING A PORTION OF THAT CALLED 499 23 ACRE TRACT OF LAND DESCRIBED IN THE DEED TO GRAGG INTERESTS, LTD AS RECORDED IN DOCUMENT NO 91098677 OF THE REAL PROPERTY RECORDS OF TRAVIS COUNTY, TEXAS, SAID 9 6254 HECTARE (23 785 ACRE) TRACT, AS SHOWN ON A RIGHT-OF-WAY SKETCH PREPARED BY SAM, INC FOR THIS PARCEL, BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS

BEGINNING at a ½-inch iron rod found in the south right-of-way line of Old Bliss Spillar Road, same being the northwest corner of the remainder of a called four acre tract of land (Second Tract) described in the deed to John D Deane and wife, Rowena Deane as recorded in Volume 2843, Page 512 of the Deed Records of Travis County, Texas, also being a northeast corner of said Gragg Interests, Ltd 499 23 acre tract of land, being the **POINT OF BEGINNING** and the northeast corner of the tract described herein, being 62 479 meters (204 98 feet) right of Survey Baseline "G" Station 6+768 764,

THENCE leaving the south right-of-way line of said Old Bliss Spillar Road, and with the common lines of said Deane four acre tract of land and that called twelve acre tract of land (First Tract) described in the deed to John D Deane and wife, Rowena Deane, as recorded in Volume 2843, Page 512 of the Deed Records of Travis County, Texas, and said Gragg Interests Ltd 499 23 acre tract of land the following two (2) courses and distances numbered 1 and 2

1) S 02° 42' 55" E, a distance of 147 481 meters (483 86 feet) to a ½-inch iron rod found for an ell corner in said common line, same being the southwest corner of said Deane twelve acre tract of land, and

2) N 87° 54' 47" E, a distance of 91 538 meters (300 32 feet) to a ½-inch iron rod with a Texas Department of Transportation (TxDOT) aluminum cap set on a curve, and being 67 005 meters (219 83 feet) right of Survey Baseline "G" Station 6+587 016 from which a fence corner post found bears, N 87° 54' 47" E, a distance of 451 903 meters (1482 62 feet) for reference

THENCE leaving said common line and crossing said Gragg Interests, Ltd 499 23 acre tract of land the following two (2) courses and distances, numbered 3 and 4

3) with the partial arc of a curve to the left passing at an arc distance of 37 558 meters (123 22') a TxDOT Type II right-of-way monument set and being 64 924 meters (213 00') right of survey baseline "G" station 6+548 625 continuing for a total arc distance of 173 101 meters (567 92 feet) through a

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EXHIBIT A

PAGE 2 OF 6 PAGES (Page 2 of 3)

central angle of 4° 16' 50", having a radius of 2316 923 meters (7601 44 feet) and a chord that bears S 34° 59' 33" E, a distance of 173 061 meters (567 78 feet) to a TxDOT Type II right-of-way monument set for point of tangency, and being 60 961 meters (200 00 feet) right of Survey Baseline "G" Station 6+413 159, and

4) S 37° 07' 55" E, a distance of 444 461 meters (1458 20 feet) to a ½-inch iron rod with a TxDOT aluminum cap set for the southeast corner of the tract described herein, and being 60 961 meters (200 00 feet) right of Survey Baseline "G" Station 5+968 699, same being in the north line of a called 16 755 acre tract of land described in the deed to Jim D Little and wife, Leslie M Little as recorded in Volume 284, Page 826 of the Deed Records of Hays County, Texas, same being a south line of said Gragg Interests, Ltd 499 23 acre tract of land, from which a ½-inch iron rod found for an ell corner of said Gragg Interests, Ltd 499 23 acre tract of land same being the northeast corner of said Little 16 755 acre tract of land, bears N 88° 59' 43" E, a distance of 84 325 meters (276 66 feet) for reference,

5) THENCE with said common line S 88° 59' 43" W, a distance of 150 950 meters (495 24 feet) to a ½-inch iron rod with a TxDOT aluminum cap set for the southwest corner of the tract described herein and being 60 961 meters (200 00 feet) left of Survey Baseline "G" Station 6+057 696, from which a ½-inch rod found for the northwest corner of said Little 16 755 acre tract of land, same being an ell corner of said Gragg Interests, Ltd 499 23 acre tract of land bears, S 88° 59' 43" W, a distance of 19 567 meters (64 20 feet) for reference,

THENCE leaving said common line and crossing said Gragg Interests, Ltd 499 23 acre tract of land the following six (6) courses and distances, numbered 6 through 11

6) N 37° 07' 55" W, a distance of 160 318 meters (525 98 feet) to a TxDOT Type II right-of-way monument set for point of curvature, and being 60 961 meters (200 00 feet) left of Survey Baseline "G" Station 6+218 014,

7) with the arc of a curve to the left an arc distance of 126 259 meters (414 23 feet) through a central angle of 02° 04' 41", having a radius of 3481 173 meters (11421 15 feet) and a chord that bears N 38° 10' 13" W, a distance of 126 252 meters (414 21 feet) to a TxDOT Type II right-of-way monument set for point of tangency, and being 63 250 meters (207 51 feet) left of Survey Baseline "G" Station 6+344 245,

8) N 39° 12' 35" W, a distance of 204 514 meters (670 98 feet) to a TxDOT Type II right-of-way monument set for point of curvature, and being 70 665 meters (231 84 feet) left of Survey Baseline "G" Station 6+548 625,

9) with the arc of a curve to the right an arc distance of 285 166 meters (935 58 feet) through a central angle of 13° 47' 42", having a radius of 1184 412 meters (3885 86 feet) and a chord that bears N 33° 32' 21" W, a distance of 284 478 meters (933 32 feet) to a TxDOT Type II right-of-way monument set, and being 75 101 meters (246 39 feet) left of Survey Baseline "G" Station 6+824 161,

10) N 56° 32' 19" W, a distance of 14 802 meters (48 56 feet) to a TxDOT Type II right-of-way monument set, and being 82 181 meters (269 62 feet) left of Survey Baseline "G" Station 6+834 391, and

11) with the arc of a curve to the right an arc distance of 51 821 meters (170 02 feet) through a central angle of 10° 12' 04", having a radius of 291 063 meters (954 93 feet), and a chord that bears, N 87° 07' 43" W, a distance of 51 753 meters (169 79 feet) to a TxDOT Type II right-of-way monument set for the northwest corner of the tract described herein, being in the south right-of-way

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EXHIBIT A

PAGE 3 OF 6 PAGES (Page 3 of 3)

line of said Old Bliss Spillar Road, same being the north line of said Gragg Interests, Ltd 499 23 acre tract of land, from which a ½-inch iron rod found for a northwest corner of said Gragg Interests, Ltd 499 23 acre tract of land bears, S 87° 27' 14" W, a distance of 114 440 meters (375 46 feet) for reference,

12) **THENCE** with the south right-of-way line of said Old Bliss Spillar Road, same being the north line of said Gragg Interests, Ltd 499 23 acre tract of land, N 87° 27' 14" E, a distance of 210 425 meters (690 37 feet) to the **POINT OF BEGINNING** and containing 9 6254 hectares (23 785 acres) of land, more or less

All bearings are based on the Texas State Plane Coordinate System, Central Zone, NAD 83 HARN

Note English units, shown in parenthesis herein, are provided for information only

THE STATE OF TEXAS }
} KNOW ALL MEN BY THESE PRESENTS
COUNTY OF TRAVIS }

That I, John E Brautigam, a Registered Professional Land Surveyor, do hereby certify that the above description is true and correct to the best of my knowledge and belief and that the property described herein was determined by a survey made on the ground under my direction and supervision

WITNESS MY HAND AND SEAL at Austin, Travis County, Texas this the 23rd day of April, 1999 A D

SURVEYING AND MAPPING, Inc
4029 Capital Of Texas Hwy , So Suite 125
Austin, Texas 78704

John E Brautigam
Registered Professional Land Surveyor
No 5057 - State of Texas

STATE OF TEXAS REGISTERED JOHN E BRAUTIGAM 5057 PROFESSIONAL LAND SURVEYOR

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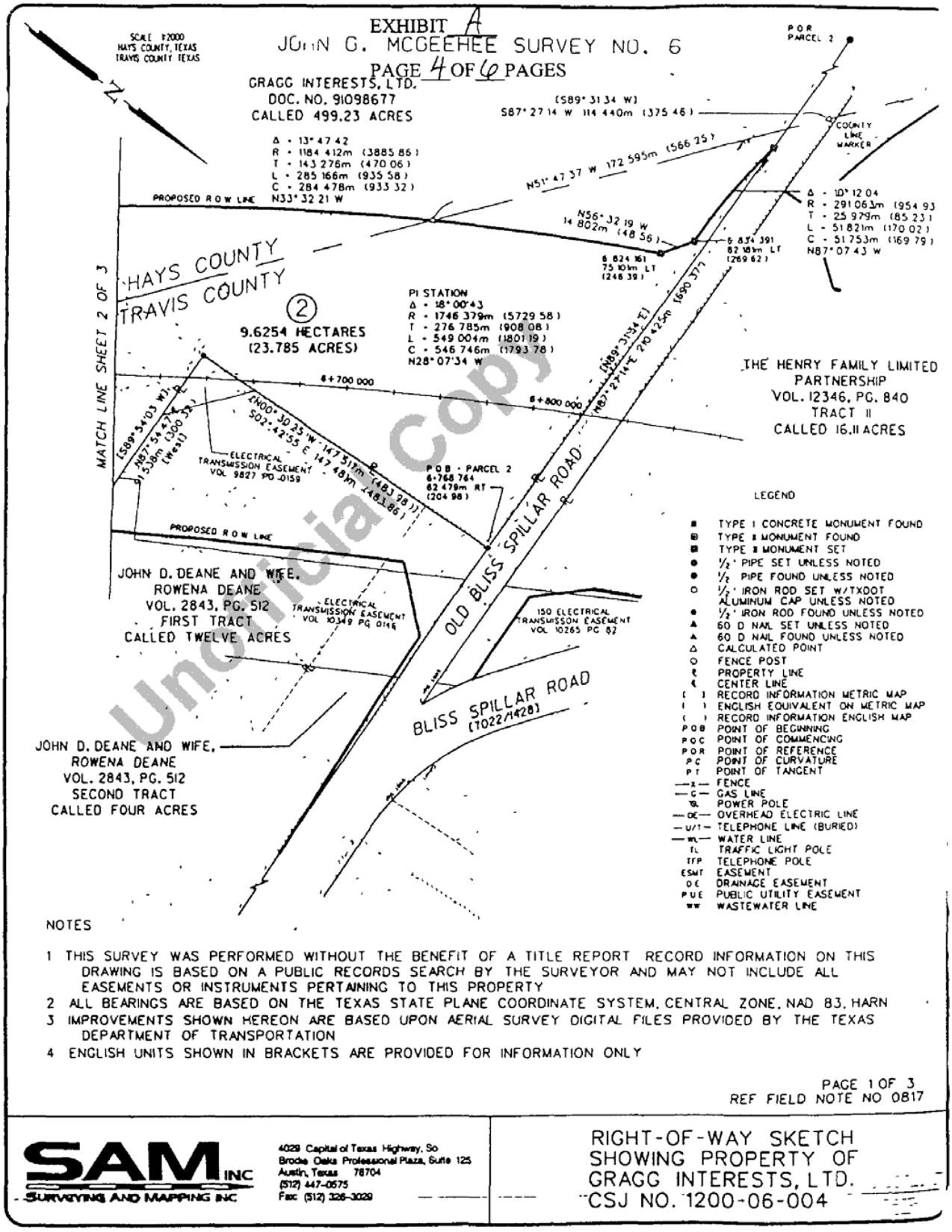

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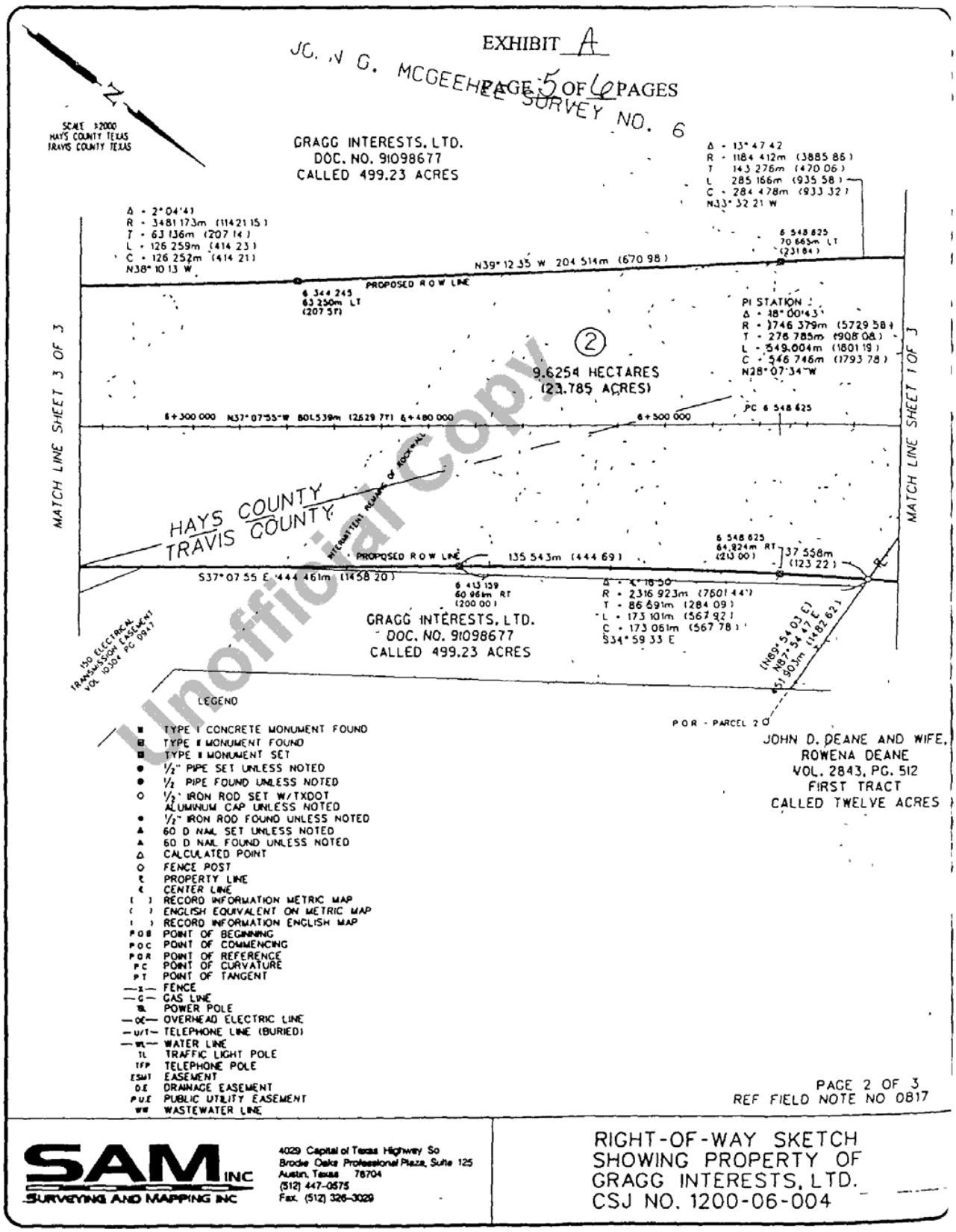

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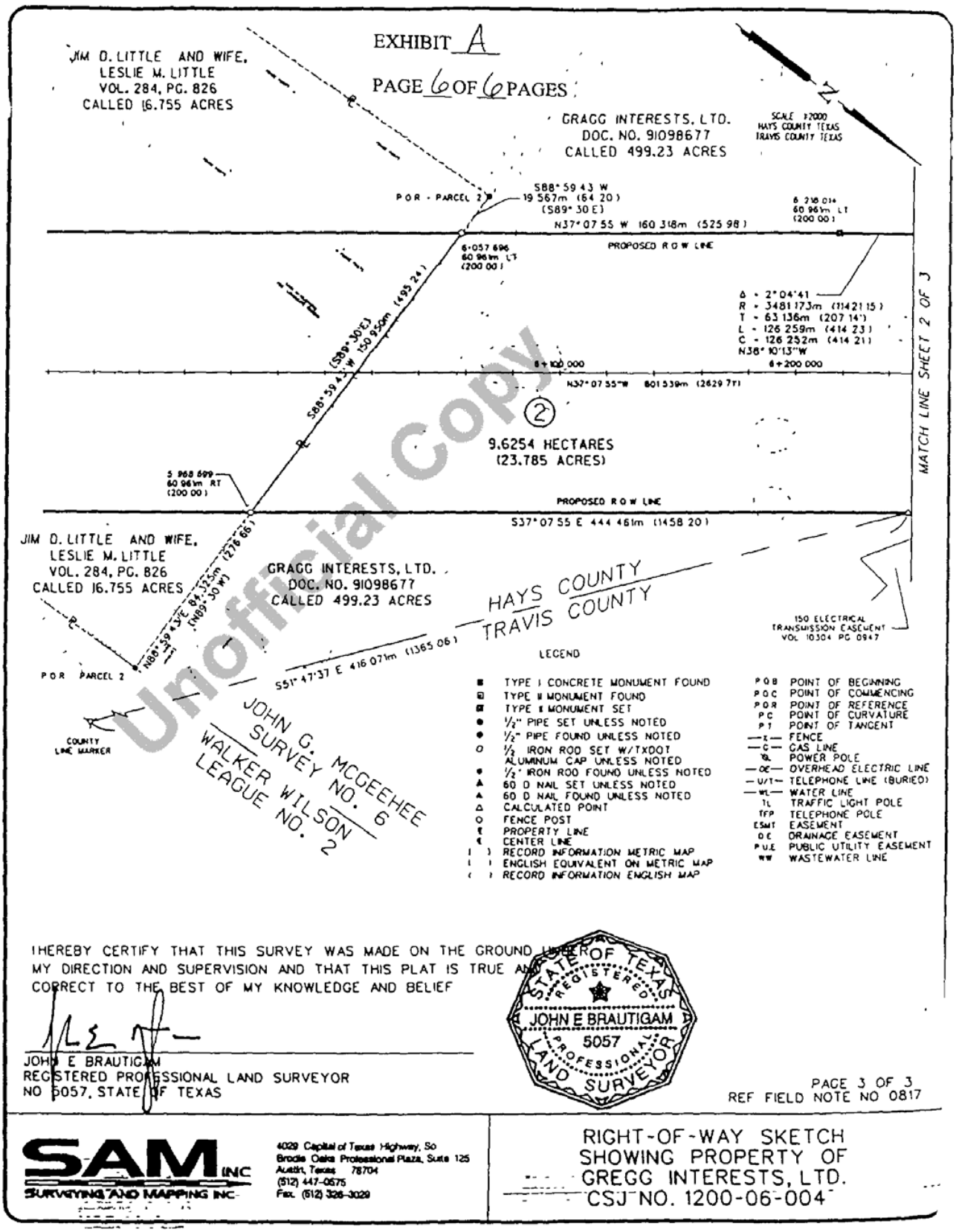

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FILED AND RECORDED

OFFICIAL PUBLIC RECORDS

06-28-2001 02 20 PM 2001105272
CORTEZR $29 00
DANA DEBEAUVOIR ,COUNTY CLERK
TRAVIS COUNTY, TEXAS

Recorders Memorandum-At the time of recordation this instrument was found to be inadequate for the best reproduction, because of illegibility, carbon or photocopy, discolored paper, etc All blockouts, additions and changes were present at the time the instrument was filed and recorded

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T.X.D.O.T.
RECEIVED
AUG 19 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

Smart Mobility, Inc.
205 Billings Farm Road, Unit 2-E
White River Junction,
VT 05001

TxDOT – Austin District
Attention: Stacey Benningfield
P.O. Box 15426
Austin
TX 78761-5426

Dear Ms. Benningfield:

Enclosed are comments on the SH 45 SW Draft Environmental Impact Statement that I am submitting in support of Save Our Springs Alliance.

Sincerely,

Norman L Marshall
President

Review of State Highway 45 Southwest Draft Environmental Impact Statement

Norman L. Marshall
President
August 2014

Prepared for the
Save Our Springs Alliance

Summary

I have reviewed the Draft Environmental Impact Statement (DEIS) for State Highway 45 Southwest, prepared by the Texas Department of Transportation, dated June 2014. I have identified four major deficiencies in the DEIS:

1) Travel Forecasts - Future roadway volume forecasts for the study area for the No Build and Build alternatives should be provided. The travel time forecasts are insufficiently documented to know whether they are credible. Two other key SH 45 SW modeling reports should be discussed in the DEIS and included as appendices.

2) Indirect Road Impacts – Modeling done for a 2014 TxDOT report on SH 45 SW shows highly significant traffic impacts to MoPac and FM 1626. These impacts are mentioned only in passing in the DEIS as potentially impacting neighborhoods. These critical impacts must be fully presented including traffic impacts, and these impacts should be weighed against the project benefits. The impacts should be mitigated if possible.

3) Logical Termini and Independent Utility – Roadway projects are supposed to be evaluated in their entirety rather than piecemeal to make sure that the full impacts of a project are properly disclosed. Unmitigated impacts on FM 1626 would lead to immediate calls for extension of SH 45 SW to I-35. The DEIS should acknowledge future pressure to extend the roadway to I-35 and discuss the potential impacts.

4) Indirect Land Use Impacts – Based on national experience and research and based also on common sense, this project would be expected to have significant impacts on development within the study area. The DEIS discounts this by relying on unnamed experts. The issue of indirect land use impacts should be dealt with more formally using one of the methods outlined in *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (2002).

SH 45 Travel Forecasts

I have reviewed dozens of roadway Environmental Impact Statements and this is the first one that I have seen that has not included forecasts of future roadway volumes. Future roadway volume forecasts for the study area for the No Build and Build alternatives should be provided. Instead, only travel time forecasts are presented and these are included only for the proposed roadway and two other routes as shown in the table below reproduced from the DEIS (p. 77).

Table 3.2-10: Travel Time Differences With and Without SH 45SW

Peak Hour	Route	Begin	End	No Build: 2035 Projected Total Travel Time (min)	Build: 2035 Projected Total Travel Time (min)	2014 Observed Travel Times (min)[1]
AM	SH 45SW – MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	N/A	12	N/A
AM	FM 1626-Brodie-Slaughter-MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	38	29	20
AM	FM 1626-Manchaca-Slaughter-MoPac	SH 45SW at FM 1626	1500' north of Slaughter Ln on MoPac	44[2]	32[2]	22[2]
PM	MoPac-SH 45SW	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	N/A	10	N/A
PM	MoPac-Slaughter-Brodie-FM 1626	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	37	28	19
PM	MoPac-Slaughter-Manchaca-FM 1626	1500' north of Slaughter Ln on MoPac	SH 45SW at FM 1626	41	30	29

(1): A minute of travel time was added to account for the decrease in speed associated with MoPac on and off ramps.
(2): Travel times adjacent to Menchaca Elementary were increased 25% to account for the reduced speed in the school zone.
Source: RTG, 2014

The numbers in the table above are insufficiently documented. The DEIS says only that: "Travel time differences were calculated using the CAMPO 2035 travel demand model, updated to reflect current demographic and traffic conditions in the southern Travis/northern Hays County area." The reference "RTG" says only: "Rodriguez Transportation Group (RTG). 2014. "Travel Time Calculations for SH 45SW and Area Roadways in 2014 and 2035." [computer file]" (p. 329)

In fact, there have been several versions of the CAMPO model in use over the past several years, including at least two versions customized for analysis of SH 45 SW. These models are described in:

- *Logical Termini Technical Memorandum: SH 45 Southwest Traffic Study in Travis County and Hays County*. Prepared for the Texas Department of Transportation Austin District and Rodriguez Transportation Group by Brown & Gay Engineers, November 8, 2012
- DRAFT Traffic Forecasting Methodology Memorandum, prepared by the Texas Department of Transportation, February 2014

Inexplicitly, the 2012 Brown & Engineers document is not referenced in the DEIS although it presents detailed forecasts for SH 45 and intersecting roadways. The 2014 TxDOT report is mentioned only once in the DEIS in reference to impacts on other roadways, even though it also presents detailed forecasts for SH 45. Both of these documents should have been documented in the DEIS and also included as appendices.

The DEIS does not describe which model version was used for the travel time numbers or provide any documentation as to why these estimates should be considered valid. For example, no information is provided as to whether the model used accurately reflects base year conditions either for traffic volumes or for travel times.

I have reviewed the two SH 45 SW reports listed above, and also have reviewed the underlying model files for two recent CAMPO model versions and the 2014 TxDOT report model version. The forecast 2035 traffic volume for SH 35 SW ranges from 17,000 to 35,000 across these different model versions. This indicates a high level of uncertainty in future travel volumes. In these models, relatively small differences in traffic volumes translate into larger differences in travel times as travel delay in the model increases exponentially with traffic volume. Therefore, there is an even greater uncertainty concerning future travel times. The travel time estimates given in the DEIS cannot be accepted as accurate without proper documentation.

Indirect Road Impacts

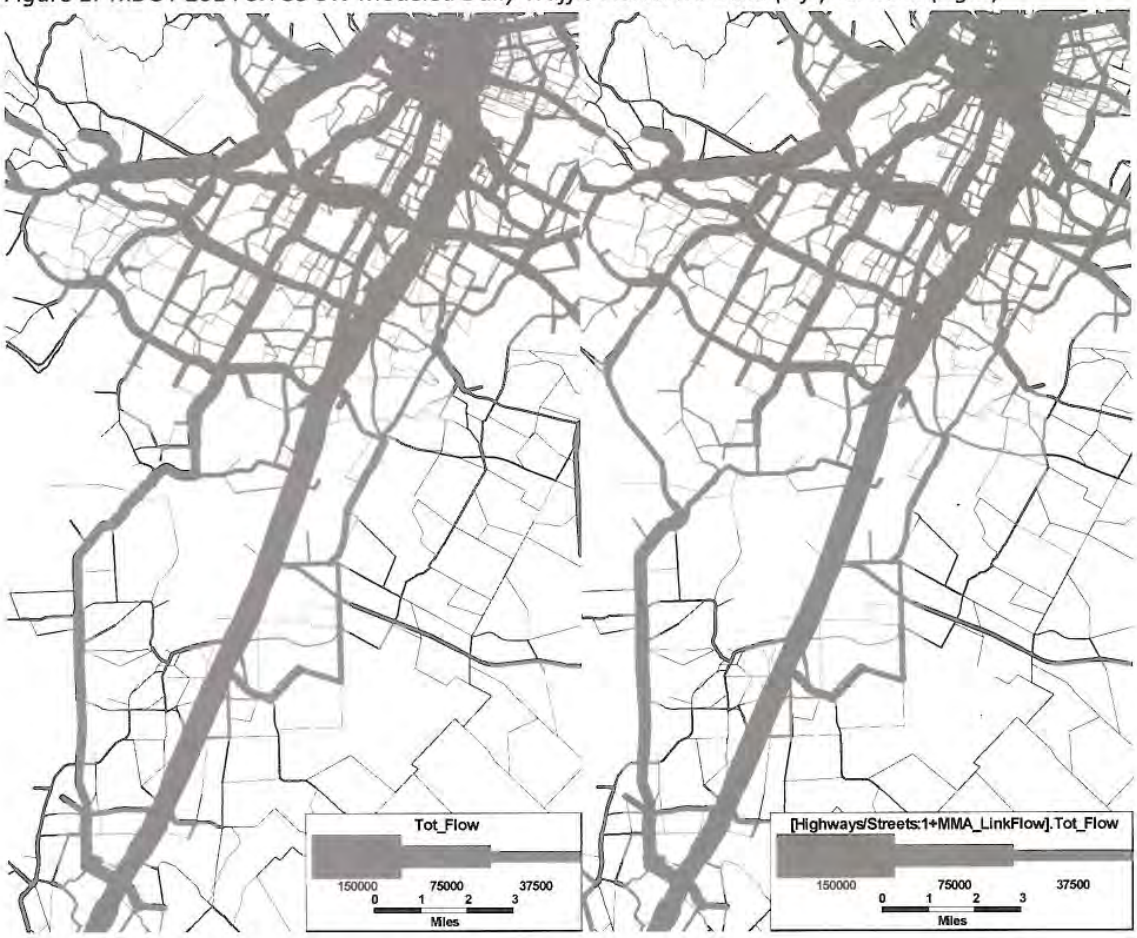
No trip begins or ends on a limited access freeway. Each vehicle on SH 45 SW will use other roadways to access it on each end. The impacts of this traffic on these intersecting roadways will be significant.

The modeling done for the 2014 TxDOT report appears to be the most detailed modeling of the impacts of SH 45 SW that has been done to date. Subarea model enhancements from the original CAMPO model included:

- smaller Transportation Analysis Zones (TAZs),
- revised road capacity and free-flow speeds,
- reduced congested speeds, and
- calibration to traffic counts.

Figure 1 illustrates the 2035 No Build and Build traffic flows in this 2014 TxDOT modeling.

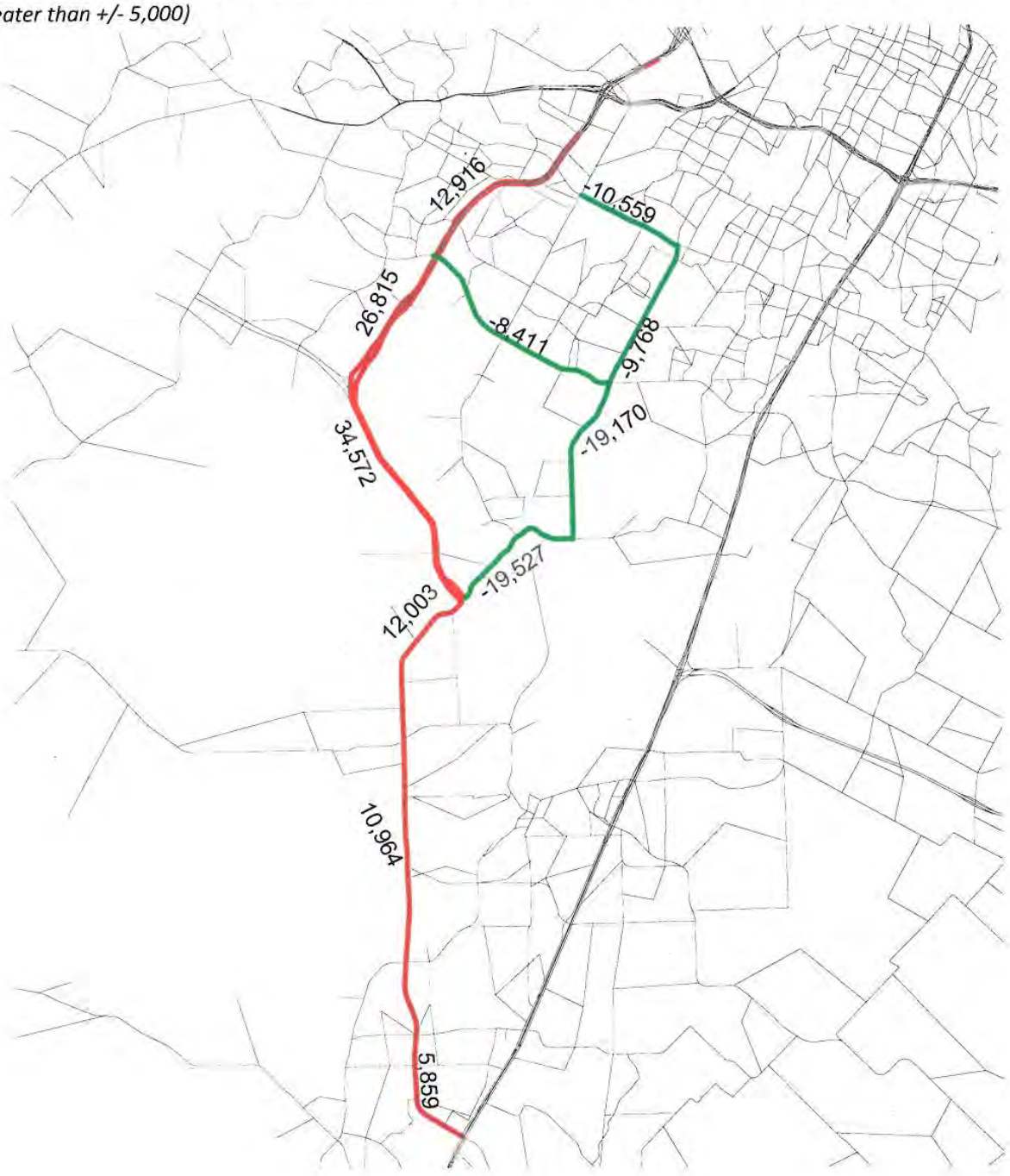
Figure 1: TxDOT 2014 SH 35 SW Modeled Daily Traffic Flows: No Build (left) vs. Build (right)



In Figure 1 above, the width of the lines is proportional to 2035 daily traffic volume. I-35 is very thick and MoPac is also quite thick. In the Build alternative (right), the proposed SH 45 SW appears as a moderately thick line that is absent in the No Build alternative (left). However, what is more striking is how much the addition of SH 45 SH adds to the width and traffic volumes of the intersecting roadways South Mopac and FH 1626. This should not be surprising. MoPac would be the primary access to the western terminus of SH 45 SW and FM 1626 is the only access at the eastern terminus.

Figure 2 illustrates the numerical daily traffic volume differences between the 2035 Build and No Build alternatives.

Figure 2: TxDOT 2014 SH 35 SW Modeled Daily Traffic Flows: 2035 Build Minus No Build (Differences greater than +/- 5,000)



As shown in Figure 2, construction of SH 45 SW would reduce future traffic levels significantly on FM 1626 north of the proposed roadway and Slaughter Lane (as highlighted in the DEIS) and also on E. William Cannon Drive. However, a fair accounting in the DEIS would equally highlight the significant increases on Mopac and on FM 1626 south of the proposed roadway. As shown below, the 2014 modeling indicates that these increases would have an even greater traffic impact than the decreases. In the Build alternative, sections of Mopac and FM 1626 exceed capacity that do not in the No Build alternative. Delays on these roadways would be greatly increased. In contrast, the roadways with less traffic in the Build alternative are not modeled as over capacity in the No Build alternative.

Figure 3: TxDOT 2014 SH 35 SW Modeled Daily Traffic Flow Exceeds Capacity (Red): No Build vs. Build

All the DEIS reports about these negative impacts is:

> The *Traffic Forecasting Methodology Memorandum* (2014), completed for TxDOT, documents the results of traffic demand modeling of the 2035 traffic forecasts both with and without the proposed project to better understand the traffic impacts that constructing the roadway may have on the surrounding roadway network. According to the memorandum, FM 1626 would experience an increase in traffic in 2035 from 0.2 mile south of RM 967 to 0.05 mile north of the Travis-Hays County line. MoPac south of Slaughter Lane would also experience an increase in traffic over No Build conditions. Impacts to neighborhoods along those roadways projected to experience increased traffic could include decreased safety for neighborhood residents, deteriorating streets, and increased traffic noise. However, projects to increase capacity and thus accommodate the increased traffic on FM 1626 from FM 2770 in Hays County north to Manchaca Road are currently undergoing construction or are in planning stages (Hays County, 2013; Travis County, 2014). (p. 85)

This limited treatment is grossly inadequate. The traffic impacts of these increases go far beyond impacts of adjacent neighborhoods to the same types of congestion and travel time impacts that are touted as benefits of the project when applied to the other roadways.

These impacts must be properly disclosed and mitigated if possible.

Logical Termini and Independent Utility

"Logical termini" and "independent utility" have important meanings in National Environmental Policy Act (NEPA) case law. Roadway projects are supposed to be evaluated in their entirety rather than piecemeal to make sure that the full impacts of a project are properly disclosed.

Unmitigated impacts on FM 1626 would lead to immediate calls for extension of SH 45 SW to I-35. The "Logical Termini" study done for TxDOT in 2012 and not referenced in the DEIS showed greater traffic benefits if SH 45 SW is extended to I-35. The DEIS is strangely silent on this "elephant in the room" – somehow managing not to mention this study or the region's primary roadway a single time in the entire DEIS. Instead, the DEIS states only:

> The termini of the proposed project are MoPac and FM 1626. Constructing the proposed project between these termini would result in a usable transportation improvement and a reasonable expenditure of public funds even if no additional improvements are made in the area. The project would stand alone, be independently functional, and serve a substantial public purpose by itself. In addition, it would not predetermine locations and types of future transportation improvements or force future sections of projects or alignments. Therefore, the project has both logical termini and independent utility. (p. 1-2)

This text appears to have been crafted by lawyers to say as little as possible. The DEIS should acknowledge future pressure to extend the roadway to I-35 and discuss the potential impacts.

Indirect Land Use Impacts

A 2007 report on modeling by the Transportation Research Board (TRB) states:

> An inherent weakness of the aggregate trip-based modeling approach is reliance on demographic forecasts that are independent of the travel forecasting system. With few exceptions, travel forecasting procedures make use of data that are developed independently, often with no input from or feedback to transportation system attributes. These data—forecasts of population, households, and employment, both in total magnitude and as allocated to specific geographic subareas—are significant drivers of travel forecasts. Errors or uncertainties in these data may introduce errors of unknown magnitude into the travel forecasts. In metropolitan regions that are growing slowly or are stable, regional errors in demographic forecasts are likely to be small; in more rapidly changing regions, greater errors in demographic forecasts would be expected. There may be considerably more uncertainty in allocating regional demographic forecasts to subareas. If an area is undergoing steady or even dramatic growth, one can predict future regional population and employment with some confidence; where those people and jobs are going to go within the region is far more uncertain.[1]

The excerpt above emphasizes "feedback", i.e. modeling transportation and land use together. Both common sense and extensive research demonstrate that construction of SH 45 SW would accelerate future growth in this area. This induced land use would in turn increase average trip lengths, adding vehicle miles of travel that would undermine the potential benefits of the project. This feedback between land use and transportation is not accounted for in the DEIS, and therefore the DEIS exaggerates the benefits of the SH 45 SW.

The DEIS Indirect Impacts Technical Report states:

> In addition to direct effects, major transportation projects may also have indirect effects on land use and the environment. As defined by the CEQ, indirect effects are "caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40CFR §1508.8). (p, D-1)

The Indirect Impacts Technical Report identifies potential indirect land use effects as affecting threatened and endangered species. However, it then concludes:

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[1] Transportation Research Board (TRB) Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting. Special Report 288: *Metropolitan Travel Forecasting Current Practice and Future Directions*, p. 76. 2007.

> Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis Counties, and the responses of local planning experts, the proposed project is not anticipated to generate significant induced development. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would constrain the amount of induced growth possible in the AOI. Several local planning experts maintain that much of the planned development in the area will occur regardless of the fate of the proposed project. (p. D-63)

Relying on unnamed "local planning experts" is a woefully inadequate response to this critical issue as there are certainly other "local planning experts" who think that the impacts will be very significant. The DEIS should quantify the impacts using one of the methods described in the National Cooperative Highway Research Program (NCHRP) *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (Special Report 466, 2002) – which is referenced in the DEIS.

Resume

NORMAN L. MARSHALL, PRESIDENT

nmarshall@smartmobility.com

EDUCATION:

Master of Science in Engineering Sciences, Dartmouth College, Hanover, NH, 1982
Bachelor of Science in Mathematics, Worcester Polytechnic Institute, Worcester, MA, 1977

PROFESSIONAL EXPERIENCE:

Norm Marshall helped found Smart Mobility, Inc. in 2001. Prior to this, he was at Resource Systems Group, Inc. for 14 years where he developed a national practice in travel demand modeling. He specializes in analyzing the relationships between the built environment and travel behavior, and doing planning that coordinates multi-modal transportation with land use and community needs.

Regional Land Use/Transportation Scenario Planning

California Air Resources Board – Leading team including the University of California that is reviewing the ability of the new generation of regional activity-based models and land use models to accurately account for greenhouse gas emissions from alternative scenarios including more compact walkable land use and roadway pricing.

Chicago Metropolis Plan and Chicago Metropolis Freight Plan (6-county region)— developed alternative transportation scenarios, made enhancements in the regional travel demand model, and used the enhanced model to evaluate alternative scenarios including development of alternative regional transit concepts. Developed multi-class assignment model and used it to analyze freight alternatives including congestion pricing and other peak shifting strategies. Chicago Metropolis 2020 was awarded the Daniel Burnham Award for regional planning in 2004 by the American Planning Association, based in part on this work.

Envision Central Texas Vision (5-countyregion)—implemented many enhancements in regional model including multiple time periods, feedback from congestion to trip distribution and mode choice, new life style trip production rates, auto availability model sensitive to urban design variables, non-motorized trip model sensitive to urban design variables, and mode choice model sensitive to urban design variables and with higher values of time (more accurate for "choice" riders). Analyzed set land use/transportation scenarios including developing transit concepts to match the different land use scenarios.

Mid-Ohio Regional Planning Commission Regional Growth Strategy (7-county Columbus region)—developed alternative future land use scenarios and calculated performance measures for use in a large public regional visioning project.

Baltimore Vision 2030—working with the Baltimore Metropolitan Council and the Baltimore Regional Partnership, increased regional travel demand model's sensitivity to land use and transportation

infrastructure. Enhanced model was used to test alternative land use and transportation scenarios including different levels of public transit.

Municipal Planning

City of Honolulu – Kaka'ako Transit Oriented Development (TOD) – applied regional travel demand model in estimating impacts of proposed TOD including estimating internal trip capture.

City of Grand Rapids – Michigan Street Corridor – developed peak period subarea model including non-motorized trips based on urban form. Model is being used to develop traffic volumes for several alternatives that are being additional analyzed using the City's Synchro model

City of Omaha - Modified regional travel demand model to properly account for non-motorized trips, transit trips and shorter auto trips that would result from more compact mixed-use development. Scenarios with different roadway, transit, and land use alternatives were modeled.

City of Dublin (Columbus region) – Modified regional travel demand model to properly account for non-motorized trips and shorter auto trips that would result from more compact mixed-use development. The model was applied in analyses for a new downtown to be constructed in the Bridge Street corridor on both sides of an historic village center.

Transit Planning

Regional Transportation Authority (Chicago) and Chicago Metropolis 2020 – evaluating alternative 2020 and 2030 system-wide transit scenarios including deterioration and enhance/expand under alternative land use and energy pricing assumptions in support of initiatives for increased public funding.

Capital Metropolitan Transportation Authority (Austin, TX) Transit Vision – analyzed the regional effects of implementing the transit vision in concert with an aggressive transit-oriented development plan developed by Calthorpe Associates. Transit vision includes commuter rail and BRT.

Bus Rapid Transit for Northern Virginia HOT Lanes (Breakthrough Technologies, Inc and Environmental Defense.) – analyzed alternative Bus Rapid Transit (BRT) strategies for proposed privately-developing High Occupancy Toll lanes on I-95 and I-495 (Capital Beltway) including different service alternatives (point-to-point services, trunk lines intersecting connecting routes at in-line stations, and hybrid).

Central Ohio Transportation Authority (Columbus) – analyzed the regional effects of implementing a rail vision plan on transit-oriented development potential and possible regional benefits that would result.

Roadway Corridor Planning

Managed Toll Lanes in the Chicago region (Reason Foundation) – Developed advanced model of the Chicago area that calculates variable tolls by link for seven weekday time periods. The model was used to analyze a comprehensive set of new toll roads and managed toll lanes added to existing freeways.

Hudson River Crossing Study (Capital District Transportation Committee and NYSDOT) – Analyzing long term capacity needs for Hudson River bridges which a special focus on the I-90 Patroon Island Bridge where a microsimulation VISSIM model was developed and applied.

T.X.D.O.T.
RECEIVED

AUG 1 8 2014

DISTRICT 14 - MAIL ROOM
AUSTIN, TX

I wish to register two of my chief objections to the TxDOT draft and the TxDOT process being used to plan and publicize the extension of MoPac through, ultimately, to I-35.

Any transportation professional, engineer or even educated citizens must recognize that the three or four mile extension to, essentially, nowhere will not have much impact on anything, including traffic, in the area. The real problems with impact will arise when MoPac is extended to connect with I-35, converting MoPac from an important local artery for residents all along the west side of the metropolitan area into an alternate to the interstate highway from Canada to Mexico.

The estimate of 15,000 to 40,000 trips over the south end of MoPac may be reasonable as long as the highway is for local use and, in effect, a dead end street. It is not a reasonable estimate of impact if the currently local highway is connected to I-35 north and south of Austin, hence (once again) from Canada to Mexico. An honest impact statement and hearing process would include effects of the total plan on traffic at different points all the way to its northern connection to I-35 along with feeders, and those of us who live along and presently use MoPac would be notified of the plans and their impact.

In fact, if MoPac is to be connected as an alternate I-35, a serious part of the added impact will fall far north of the area studied in the miles of MoPac now already recognized as a serious bottleneck to even to existing north south local traffic, and being overhauled (with some opposition) by adding a pitiful single lane to improve existing traffic flow.

The piecemeal approach to planning and calling for approval of one little relatively meaningless and therefore low impact part of the eventual system intended makes TxDOT appear to be irresponsibly short sighted or seriously deceptive and dishonest. Your agency does not need to increase those appearances by presenting such inadequate plans

Gary R McKenzie
[redacted]

Gary R McKenzie

SH 45 SW

ENVIRONMENTAL STUDY

PUBLIC HEARING - JULY 29, 2014

COMMENT FORM

T.X.D.O.T.
RECEIVED
AUG 14 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

Name (please print):

TSRA Member
Kristen Ploeger - Ph.D.
PO Box 177
Manchaca, TX 78652

Comment:

See attachment, please!

Written comments may also be mailed to TxDOT Austin District Environmental Coordinator, Texas Department of Transportation, P.O. Drawer 15426, Austin, Texas, 78761-5426, or faxed to 512-832-7157. Comments submitted by website (www.SH45SW.com), mail or fax must be received by **Wednesday, August 13, 2014**.

This form may be used to provide written comments on this project. Any questions placed on this form will not be considered an open records request and will not be treated as such. If you have an open records request, it must be submitted under a separate letter.

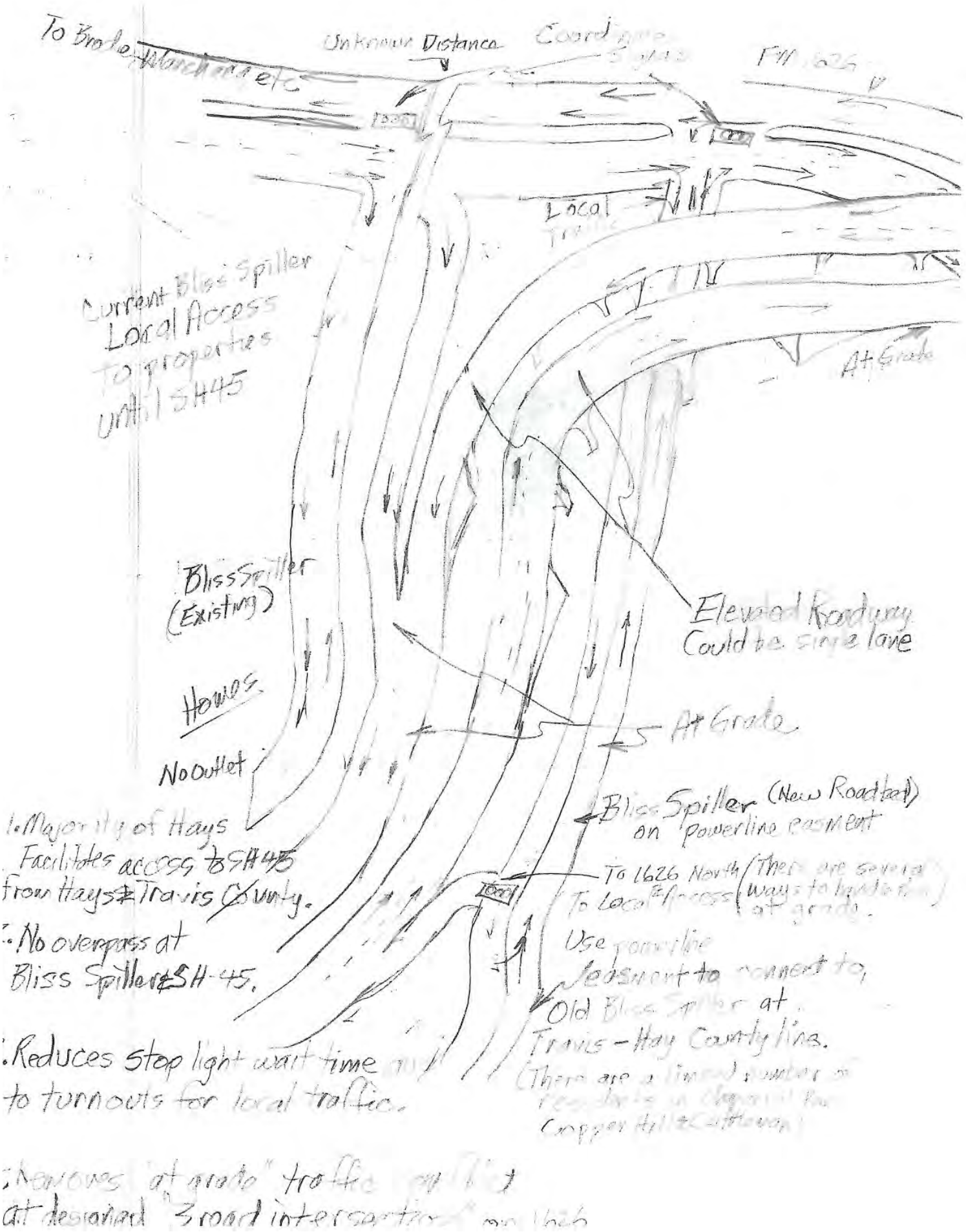
(Texas Transportation Code, §201.811(a)(5). Check each of the following boxes that may apply to you:
□ I am employed by TxDOT
□ I do business with TxDOT
□ I could benefit monetarily from the project or other item about which I am commenting on

JULY 29, 2014 – PUBLIC HEARING

Dear TxDOT Design Team Personnel,
Please consider this as a contribution to the SH45 and FM1626 interchange.
I know, I know....you get all kinds of "wild" help and suggestions from "wanna be" engineers.
One of the major issues apparent at the Public Hearing was the complexity of the interchange of SH45 and FM1626 as necessitated by the SH45 overpass of FM1626 at the Travis-Hays County line.
But, please take a moment to consider this.
Thank You.
Kristen

The attached sketch removes the need for an overpass at the intersection of SH45 & Bliss Spiller Road. Instead, the raised roadway is located at the intersection of SH45 & FM1626. It appears that a single level elevated roadway will provide for efficient traffic flow. The expense of this approach will be marginally more than the proposed overpass by SH45 at Bliss Spiller. But, the attached suggestion will greatly facilitate the traffic flow from FM1626 onto SH45.

This approach is founded upon a few presumptions, as follows:
1. The vast majority of traffic will be from Hays County, traveling north and south on FM1626.
2. Significant traffic will travel from Austin via west bound FM1626 from Brodie, Manchaca, S1st & IH35.
3. Very little traffic will travel along Bliss Spiller from Chaparral Park, Copper Hills & Cattleman.
4. Current Bliss Spiller roadbed can remain in place to service local homes until SH45 crosses Bliss Spiller.
5. A new Bliss Spiller can parallel SH45 along the power line easement to service local sub-divisions.
6. An elevated SH45 will provide continuous flow from Hays County on FM1626.
7. South bound FM1626 will access SH45 west at roadbed grade elevation.
8. Two standard lighted intersections will control Bliss Spiller traffic interchanges at FM 1626.


To Brode, Wanchaca etc
Unknown Distance
Coordinate Signals
FM 1626
Local Traffic
Current Bliss Spiller Local Access to properties until SH45
At Grade
Bliss Spiller (Existing)
Elevated Roadway Could be single lane
Homes
At Grade
No Outlet
Bliss Spiller (New Roadbed) on powerline easment
1. Majority of Hays Facilitates access to SH45 from Hays & Travis County.
To 1626 North
To Local Access
(There are several ways to handle them at grade.)
2. No overpass at Bliss Spiller & SH-45.
Use powerline easment to connect to, Old Bliss Spiller at Travis - Hay County line.
(There are a limited number of residents in Chaparral Pass Copper Hill & Cattleman)
3. Reduces stop light wait time and to turnouts for local traffic.
4. Removes "at grade" traffic conflict at designed "3 road intersection" on 1626

Jason A. Isaac

Capitol Office
P.O. Box 2910
Austin, Texas 78768-2910
(512) 463-0647

Counties
Blanco
Hays

State Representative
District 45

August 12, 2014

TxDOT Austin District Environmental Coordinator
Texas Department of Transportation
P.O. Box 15426
Austin, Texas 78761-5426

To Whom It May Concern,

I am writing today to express my full support for the building of SH 45 SW. This road is incredibly important to the constituents I serve in Hays County as well as critical for the future mobility the region.

Since this road was first proposed decades ago, local residents, voters, and transportation experts have worked see this project completed. Yet, we have not broken ground. The building of SH 45 SW is necessary in order to address our transportation issues in this rapidly growing area. In addition to safety and congestion issues associated with the heavy commuter traffic forced to cut through neighborhood roads, police, fire, and EMS personnel need a more direct route between the two areas that SH 45 SW will connect in order to increase efficiency and response times in emergencies.

Although it is important that precautions are taken to safeguard this environmentally sensitive area, the Texas Department of Transportation has gone above and beyond to ensure that the Edwards Aquifer is protected. In fact, the draft environmental impact statement exceeds the runoff quality standards required by the Texas Commission on Environmental Quality. All applicable laws and regulations regarding responsible environmental planning have been met.

It has been almost two decades since voters approved the bond to purchase the right of way in order for this road to be built. It is past time that this plan is fulfilled. Thank you for your continued work on this issue, and please feel free to contact me if you wish to talk further about seeing this important project to completion.

Sincerely,

Jason Isaac

Jason Isaac
State Representative

Lady Bird Johnson
Wildflowercenter
THE UNIVERSITY OF TEXAS AT AUSTIN
4801 La Crosse Avenue | Austin, TX 78739-1702 | 512.232.0100 | FAX 512.232.0138 | www.wildflower.org

August 7, 2014

TxDOT Austin District Environmental Coordinator
Texas Department of Transportation
P.O. Drawer 15426
Austin, TX 78761-5426
RE: Comments on SH-45SW Draft Environmental Impact Statement

TXDOT
RECEIVED
AUG 13 2014
AUS-ENVIRONMENTAL
DIST. 14
AUSTIN, TEXAS

Dear Environmental Coordinator,

The Lady Bird Johnson Wildflower Center respectfully submits the following comments regarding the proposed SH-45SW project.

Based on information (http://www.sh45sw.com/) provided by the Texas Department of Transportation (TxDOT), it is our understanding that upon completion of the preferred SH-45 SW alternative, approximately 30,000 more cars a day would immediately access Austin from the south using MoPac South. This number would be expected to increase over time as properties south of SH-45SW are developed. The estimate is based on TxDOT models that project traffic currently using local street networks between Hays and Travis Counties to access Austin from the south will increase by 50% between 2013 and 2035, from 210,000 vehicles per day in 2013 to 314,000 vehicles per day in 2035.

We expect that such a large increase in vehicular traffic on a high speed (65-mph) freeway such as MoPac South will generate very high levels of traffic noise on the roadway and could significantly and adversely affect the Wildflower Center. The Center's property is located at the southeast corner of MoPac South and La Crosse Avenue, and borders the east side of MoPac for more than one mile. Most of the activities related to the enjoyment and use of the Center take place outdoors. We note that the increasing traffic noise on MoPac South over the past decade has steadily diminished the tranquility of the Wildflower Center grounds.

The potential impact on the Wildflower Center is also financial. Although the Wildflower Center is a unit of the University of Texas System, it is self-sustaining, and heavily dependent on fees and other revenue generated primarily by admission fees and outdoor events and programs.

For example, the Luci and Ian Family Garden, a significant addition to our facility, opened this past May on 4.5 acres adjacent to MoPac South (Figure 1). A 300-foot buffer separates the garden from the MoPac South right-of-way. The Luci and Ian Family Garden is designed specifically for children and parents to enjoy child-centered outdoor play areas in a garden setting. But the higher levels of traffic noise generated by the projected increase in MoPac traffic that would be created by the preferred SH-45SW alternative are highly likely to diminish

public enjoyment of our facility, resulting in reduced visitorship and a corresponding loss of revenue necessary to operate the Wildflower Center. These impacts will be compounded if the proposed enhancements to MoPac South make access to La Crosse Avenue and the Wildflower Center less visible and more difficult for visitors.

We request that TxDOT fully address our specific concerns about the impacts of SH-45SW on the Wildflower Center before proceeding with the Preferred Alternative for this project.

Sincerely,

Susan Rieff
Executive Director
Lady Bird Johnson Wildflower Center
4801 La Crosse Avenue
Austin, TX 78739

Lady Bird Johnson Wildflower center
THE UNIVERSITY OF TEXAS AT AUSTIN

4801 La Crosse Avenue
Austin, Texas 78739
512.232.0100
www.wildflower.org

Figure 1. Aerial photo showing proximity of new Luci and Ian Family Garden to MoPac South.

Keep MoPac Local Emails

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:39 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : J. Stephen Adams
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:39:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:27 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jan Adler
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:27:18

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:58 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : claudia agnew
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:58:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:40 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : jacklyn alford
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 05:39:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brooke Allen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 01:04:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:50 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jack Allen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:49:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:23 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Romalda Allsup
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:22:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : G. Amy
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I- 35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:45:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Emma Anderson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:22:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:44 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Leo Anderson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Clearly your proposal needs a lot more work. Please work on the overall Environmental impact and withdraw your current Environmental Impact request.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:43:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:15 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dr. T. H. Anderson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:15:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:13 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Tommy Anderson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:12:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:12 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : M.M. Anderson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:11:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : nancy Armstrong
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:56:31

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:03 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary M Arnold
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:03:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Karin Ascot
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:08:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Devon Athans
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:03:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Zelda Austen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:45:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:44 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : RIchard Avery
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 14:44:17

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : jonathan ayres
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:24:36

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:48 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Andrew Backus
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Please focus on widening and improving traffic flow along additional N-S roads Brodie and Manchaca.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopa c/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic fl ow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 11:47:47

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Becky Badgett
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:56:57

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:04 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brooke Bailey
Email [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:04:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:00 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Roger Baker
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:59:57

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:56 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brandie Baker
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:56:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:54 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Merry Bateman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:53:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:57 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rob Baxter
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I have a point to make...
WHY HAVE YOU NOT LOOKED AT WYLDWOOD LANE AS AN ALTERNATE SOLUTION FOR BRODIE LANE RESIDENTS???
OPEN THAT ROAD UP AND IMPROVE IT TO FOUR LANES TO MOPAC AND YOU WILL CUT IN HALF OR MORE THE TRAFFIC AT SLAUGHTER AND BRODIE TURNING LEFT (WEST) WITHOUT SO MUCH AS ADDING ONE MORE CAR TO BRODIE LANE OR MOPAC.
WHY IS THIS SO HARD TO SEE AND DO?
IT WILL COST MAYBE 5 or 10 MILLION, NOT 100 MILLION AND BE TOLLED.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.
TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of build ing SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

ROB BAXTER
PRESIDENT
FRIENDSHIP ALLIANCE of NORTHERN HAYS COUNTY
www.friendshipalliance.org
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:57:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:49 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robert Beard
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:48:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Peter Beck
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

The 4 mile road covered by this project is clearly only part of the inevitable linking of mopac to I35. Therefore we need an EIS on the whole project. Every reasoned observor has noted that the toll road cannot succeed financially without connecting to I35. Every other toll road in the region connects directly to a major highway - toll road 45N doesn't stop 3 miles from I35 or 183, it connects with them. toll road 45E doesn't stop 3 m iles from I35. Toll road 130 doesn't stop 3 miles from i35, it connects with it, then connects with I10 – that's how toll roads work. The project doesn't make financial or practical sense unless it connects with I35, so lets be honest about examine the entire project area. So claiming that the project ends at 1626 is disingenous, as well as likely illegal.

Moreover, even the EIS on the existing partial segment is incomplete as throughout the document, there are references to crucial studies that are currently incomplete. A few examples:
"Karst investigations are currently underway by professional geologists in the state-owned ROW and a Geologic Assessment is pending" (Ch. 3b, p. 92)
"Currently, a qualified geologist is conducting an updated karst survey of the state-owned ROW to confirm this information. The results of that survey will be integrated into this document when received." (p227)
"A karst survey by a qualified geologi st is currently being conducted to further evaluate karst habitat and the presence of threatened and endangered karst species within the existing state-owned ROW. A future iteration of this EIS document will be updated with the results of the survey upon its completion".(230)

It is impossible for the public to comment on the outcomes of these studies, until the studies are completed so at best the EIS is incomplete, at worst it is violating both state and federal eis laws. Complete the studies, update the draft eis with the results, and then have an honest discussion of the impacts.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:07:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:21 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Al Becker
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:21:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : T Bell
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez w ith up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:18:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:02 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : ALICE BELLE WILLIAMS
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:02:20

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:46 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gioconda Bellonci
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:
It is my strong hope that the all important transportation issues in this town turned city will be responsibly addressed so that my beloved Barton Springs, which has already suffered from development decisions, will not suffer any more. While I can appreciate that the issues may be complex and many sided, the one thing that is not at all complex is the commitment to protecting our most important resource ... our water. Let's solve the transportation issues without causing further damage, so .... Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter high way to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial , environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:46:22

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:49 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chris b
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

The proposed toll road cannot begin construction before September 2015. TxDOT faces numerous hurdles before then. With your help we can stop the rush to convert Mopac to I-35 West by building the 45SW aquifer toll road. Thank you for helping to protect the Barton Springs Edwards Aquifer.

Sincerely,
Chris Benevich
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 03:49:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:19 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Margaret Bentley
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:18:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:15 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Laura Bettor
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:14:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Henry Beutelman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:02:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : sarah BISHOP
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:26:22

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susie Blagdan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Susie Blagdan
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:16:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:10 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Marc Blase
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:10:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robert L Blau
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:55:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:13 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chris Blazier
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:12:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:39 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : D bM
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:38:44

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:22 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Wendy Bobbitt
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:22:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:53 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Laura Borst
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration. I just happen to live in Texas.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:53:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:20 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ralph Boschert
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:20:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:15 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mark Boyden
Email : [redacted]
Subject : Protect Barton Springs/Edwards Aquifer - Withdraw SH 45 SW Draft EIS
Message : Dear TxDOT and CTRMA officials:

I ask you to Protect Barton Springs and the Edwards Aquifer, one of the jewels and treasures of the State of Texas and Austin. I sign on to the SOSA statement below.

Mark Boyden
Austin, TX
Native Texan

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one o f four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:14:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:44 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Tammy Bright
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:44:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:48 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Linda Briscoe Myers
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:47:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:07 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : PAt Brodnax
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:06:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : LEIGH ANN BRUNSON
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road and keep Mopac LOCAL!!!

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 02:07:59

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Karl Buesing
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Sincerely,
Karl Buesing

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:53:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:37 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Bruce Burns
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:36:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:25 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Bruce Burns
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:25:25

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:53 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Scott Burton
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:53:06

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:22 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elaine Byrne
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:21:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:21 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ernesto Calderon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:20:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dixie Camp
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.
Please focus on improving traffic flow along Brodie and Manchaca so more than one N-S travel route is improved.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:56:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sarah Campbell
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives t hat do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:16:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:19 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rodolfo Carrera
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:19:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:45 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary Cartwright
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Mary Cartwright

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:44:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:40 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Diana Chapman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:39:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:10 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jan Child
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:09:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:24 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : melanie clapp
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 10:23:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:36 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ann Clark
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Cha vez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:35:31

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:12 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Fran Clark
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:11:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:21 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jenny Clark
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West. DO NOT ADD TOLLS TO ANY EXISTING OR NEW ROADS!!

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaugh ter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertak e an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:21:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:29 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Paula Cocke
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 03:29:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:51 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Laurie Coffin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of a comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) main lanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

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Please promptly undertake an thorough evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:50:31

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cocerned Austin Driver
Email : [redacted]
Subject : Please Build the SH 45 SW road no. Two Environmental Impact Statements show
Message : Dear TxDOT and CTRMA officials:

Please build this road ASAP. SOS has held up Austin's road systems long enough. This road is over 20 years late. Do not let these wingnuts derail our city's progress.

This road will allow far south Austin and Hays county resident access to MOPAC without clogging up a small neighborhood street. Brodie is not a highway and yet it is being treated as one. It does not have sufficient environmental controls. The new road will protect our water quality far better than a 30 year old residential street.

The traffic, financial, environmental and social impacts caused by SOS are ridiculous and must be stopped. Please do everything in your power to build this road as quickly a s possible, our quality of life depends on it. Austin's traffic problems are national news and give our city too much bad press We desperately need this road, don't allow a bunch of liars to stop our progress. .

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:18:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ann Connell
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Ann Connell
Driftwood, TX

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:34:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:14 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mike Conner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:13:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:43 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cindy Cook
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:42:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:04 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gary M. Cook
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:04:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gary M. Cook
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:02:44

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:34 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cindy Corkill
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

I live near Zilker Park and do not want more pressure and congestion on the Mopac bridge over Lady Bird Lake. More importantly, I want the effects to Barton Springs Pool to be thoroughly studied.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other p ieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alter natives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:33:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:12 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Claudia Corum
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:11:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rebecca Cowser
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Rebecca Cowser
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 03:55:10

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:33 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elizabeth G. Craig
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:32:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Beverly crozier
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:25:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:06 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sara Culler
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:06:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:15 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brian Cusson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:14:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:26 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Debra Dalton
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:25:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:44 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : John Daniewicz
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:43:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kelly Davis
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I write to ask you to please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road. The draft EIS does not adequately consider the environmental effects of the project, which would in effect convert Mopac from a local commuter highway to an alternative Interstate 35 West. This would have negative impacts on Austin's culture and livability in addition to environmental degradation.

Please engage in a comprehensive analysis of the project's effects. As it currently stands, the draft EIS is not in compliance with the law. Improper segmentation of the project to mask its effects is dishonest and unlawful.

TxDOT and the CTRMA are currently pursuing th is conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to t he southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration,

Kelly Davis
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:01:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:45 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : RUTH DAWSON
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:44:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cathleen Day
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:55:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:36 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joanne Day
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:35:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:31 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joanne Day
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I really believe that if you build this road it will only encourage more growth to the area. By allowing more access to the area it will encourage a faster rate of build out. this will increase the number of cars and run of pollution into the Barton Springs Aquifer. The draft Environmental Impact Statement on the proposed SH 45 SW toll road needs to be withdrawn in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that w e analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:31:01

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:16 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Marion DeFord
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:15:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:12 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Marion DeFord
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:11:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:48 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sallie Delahoussaye
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternat ives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

We don't need to encourage further development in an environmentally sensitive recharge area of the aquifer. We are already experiencing problems with too much development for the water available.
Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:48:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : roger deleon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:04:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:47 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Char Dison
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message :

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.
It is not fair for the public to have have a true idea of things that will so great change our city. People are wary of the people in charge these days and the way this situation is being handled only furthers that assumption.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:46:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:21 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : RICHARD DONALDSON
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:21:18

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:00 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Janis Dosky
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:59:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Christopher Dowling
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:22:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:51 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : K. Doyle
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

PLease Keep MOPAC Local. Please making protecting Barton Springs Aquifer a Top Priority

Thank you for your consideration,
K Doyle.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:50:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:04 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Andrew Dunn
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:04:09

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:58 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary Dunn
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:58:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:49 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Walt Earnest
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:48:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sean Eckel
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:18:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : George Eliot
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:13:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:12 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary Ely
Email :
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:12:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:14 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Angella Emmett
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:14:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:57 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mike Espinoza
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:57:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Julie Evans
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:23:15

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:47 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Paul Fafard
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:46:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:06 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Fancy Fairchild
Email : [redacted]
Subject : Withdraw the SH 45 SW draft EIS
Message : Dear TxDOT and CTRMA officials:

IWhat is really sad is that the public input process has been subverted to the point where no-one is accountable and no-one has to listen to the public. Environmentalists and grassroots organizers have no money to educate the public at large; money will probably rule (again) and we'll be stuck with big, expensive roads way after the economic bullble bursts. then who will bail out the costs of the roads (including this one)? Travis County and other public taxpayers. Let's have an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West, and explain the true ramifications, both environmentally and financially, to the public.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thanks for reading this--hope fully you will be inspired to care about the irreplaceable environment and the public; work out a real win-win situation for transportation, and quit grasping at the greedy "solution" of tolling, which benefits only those making the money off that process.

Fancy Fairchild
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 13:05:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:42 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Erick Faul
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:42:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:11 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kristin
Email : Fine
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commut ers to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:10:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:27 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Michael O. Ford
Email : [redacted]
Subject : Withdraw the SH 45 SW draft Environmental Impact Statement
Message : To TxDOT and CTRMA officials:

The following comments were suggested by the Save Our Springs Alliance of which I am a member. I fully endorse thee remarks but will add some personal comments at the end.

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Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other p ieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alter natives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

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Having said that I will add that apparently you need to be reminded that you have civic and fiduciary responsibilities to the citizens of this state to protect our environment and use our tax dollars wisely neither of which are being upheld in this matter. I have a Masters Degree in Historic Preservation from Columbia University (1986) and have done my share of EISs and I have seen these done in both a completely impartial and balanced manner as well as in a manner that reflects the political and financial pressures surrounding them. Given the many questionable actions taken by some involved on the side in favor of the project moving forward, I suspect the latter is the case here.

In addition, I have been involved in environmental, design, and planning activities most of my life and while your draft EIS is long on words it is short on credibility. The simple fact that it does not approach the study from within the overall context of the total project disqualifies it as a truly comprehensive EIS. On that basis alone it should be rejected as flawed and inadequate. Having reviewed the document myself I note that it skillfully and consistently sidesteps or minimizes project impacts and virtually ignores long term consequences while almost dismissing out of hand viable alternatives -- at least those that were even acknowledged at all.

I have little doubt that the scope of work charged was fulfilled so I am not faulting the authors of the study per se; however, I have even less doubt that the scop e of work was carefully and politically crafted to produce a desired result and by definition is corrupt. The document should be rejected and the review process started over from square one. Anything less would be a travesty of justice, an abrogation of your fiduciary and civic responsibilities and a monumental waste of Texas citizen's tax dollars.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:27:17

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:14 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Linda N. Foss
Email : [redacted]
Subject : Reconsider the SH 45 SW draft EIS?
Message : Dear TxDOT and CTRMA:

These are difficult decisions, and you all are at the point of having to say, "enough concrete, we can't do this." I do hope you will withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West. That is truly what is needed in this case.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mo pac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and in terregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Very much yours, bottlenecks and all,

Linda Foss
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:14:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:40 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Steve Franklin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer and more noise and air pollution for those who live along the Mopac corridor, such as the families in my neighborhood (Mopac run s in part over my neighborhood in SW Austin).

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:40:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:40 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brenda Freed
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Lack of adequate planning will be disastrous!

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:39:35

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:06 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : John Frick
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:05:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:44 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sarah Gaertner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:44:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:29 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Bill Gammon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I live near the juncture of SH-45 and FM1826. I'm glad you stopped building SH-45 here. To have gone further would have done further damage to Austin, a vanishing, irreplaceable piece of Texas. Now I understand you are considering (again) doing something just as harmful a few miles down SH45 from me. Please don't.

MoPac was once a convenient, usable thoroughfare into Austin from these parts. No more, at least during large parts of the day and evening. Late night traffic is still tolerable, but not for long. If you direct all that IH-35 traffic onto MoPac, those of use locals who need that road to get to work will lose out.

Please withdraw the draft Environmental Impact Stateme nt on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can b e done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:28:35

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:59 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Carley
Email : Gazic
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuter s to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:58:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chris gebhard
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:00:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Judith Gedalia
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:45:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:58 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Leslie Geller
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:57:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:09 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Andrew George
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:09:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:42 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : James K George Jr and Diana S. George
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

It's clear that this is just another link in a long range plan for an outer loop around Austin. Why not call it, and let the people decide? To say this will relieve congestion in the Shady Hollow neighborhood and in SW Travis County is crazy. It will redirect the present congestion on Brodie Lane across the new SH 45SW onto Loop 1 north, and the blockage will move from Brodie and Slaughter to the intersection of Slaughter and Loop 1. This will trash out the route taken by all the new developments in Hays County out on RR 1826 to Driftwood. Thus I see no real improvement in traffic flow, just a change in the gridlock points, and a huge problem for all commuters coming in from Hay s County on RR 1826. In addition, this will open up Northern Hays County to developers with a shortcut to I-35. So it's a gift to development. Why try to disguise it as a solution to the Shady Hollow neighbors?

In terms of actual improvement, I have no concrete suggestions now that our dominant political party in Texas is letting road funding decay by two to three percent a year with no additional taxation policies. Is outsourcing all our new roads to private companies who will toll us and hire a new workforce of toll takers really the answer? In my generation, the roads belonged to the people, and we exacted a fair tax to pay for them.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-0 8-12 17:41:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:33 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rita E. Gier
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please Protect the Barton Springs Edwards Aquifer and keep Mopac local.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse inters ections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:33:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:28 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary S. Gifford
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:28:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:28 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Steve Gilbert
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please do not go forward with the construction of the SH 45 SW. I have lived in Circle C for 15 years, and have witnessed a dramatic increase in traffic on Mopac during that time. All that the SH 45 SW construction would do is encourage more development to the South and make Mopac traffic even worse. Increasing the rate of flow into the bottleneck at the bridge over Lady Bird Lake is not going to help anyone.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Steve
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:27:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:16 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Hayley Gillespie
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:16:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:10 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sharon Gillespie
Email : [redacted]
Subject : Request you withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives t hat do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:09:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:48 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jane Gilley
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:47:33

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:33 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ethan R. Glawe
Email : [redacted]
Subject : Request: Withdraw the Rushed SH 45 SW Draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

Before Mopac becomes a defacto alternate route through Austin, the traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking any further steps. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor, not this shady deliberate attempt to push the project through in bits and pieces. The desire to circumvent an actual study comprehensive of the entire situation is apparent to those who know the inner workings of the monied interests that stand to profit from this ill-planned proposal. Public Tax money usage requires monitoring and auditing, and we, the providers of the money you want to use, are here to ensure that happens through whichever procedural or legal recourses are available. At this stage of the game you surely must know a majority of Travis County residents are very opposed to this.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already

overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer. To not thouroughly protect a valuable resource in order to build some road and open land up for speculation would be foolhearty, but then we've come to expect this sort of thing from those who dip into the public trough. We are watching.

Please act now to avoid legal challenges and a further siphoning of our money, yours and mine.

Thanks for doing the right thing!
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:33:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:16 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Grant Godfrey
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:15:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:06 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : gayle goff
Email : [redacted]
Subject : Withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I implore you to withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road.

Replace the piecemeal approach with a comprehensive one. Examine the bottlenecks and make sure all alternatives solve these issues.

You have got to look at alternatives that do not divert I-35 commuters to Mopac, which is already maxxed out.

And you need to guarantee that the Barton Springs Edwards Aquifer is protected from increased impervious cover and not compromised in pseudo-solutions to traffic!!

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:06:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:10 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : joan goldsmith
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:10:22

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:30 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rudy Gonzales Jr.
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:29:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:09 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Albert Gonzales
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:08:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Raul Gonzalez
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:22:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:29 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Will Godwin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 03:29:15

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kori Gough
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:26:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 7:24 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kevin R. Gray
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

The draft Environmental Impact Statement for the SH45SW tollway is not a sufficiently comprehensive analysis of the total environmental effect of this project. This 4 mile segment of the resurrected Outer Parkway over the Edwards Aquifer recharge will NOT reduce traffic congestion (it would actually INCREASE it further north on MoPac) at an excessive environmental and monetary cost.

Building this segment of SH45 SW as a 0 million 4-lane toll road is a waste of tax money. If it were built as suggested in earlier times as a 2-lane free road with a smaller footprint but expandable in the future, for less than million, it would have about the SAME EF FECT in reducing traffic congestion on nearby Brodie Lane, as a tolled road will only attract approximately half the traffic than it would otherwise carry.

As I understand it, the revenue from tolls is being used to service overvalued toll bonds under mobility authority control in order to fund transit projects. This would cause a tendency to overbuild all expressways and toll them, in order to maximize these revenues for badly needed alternatives.

Until there are serious plans to widen MoPac through central Austin to AT LEAST 10 general purpose lanes, this tolled segment of SH 45 for mostly Hays County residents commuting to Austin will reduce the water quality of the Edwards Aquifer and NOT have much (if any) benefit to south Austin residents unless they are employed by toll road builders or operators!

Please withdraw the draft Environmental Impact Statement on this project.

Since rely,

Kevin R. Gray

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 00:24:25

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ed and Ellie Greene
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:35:08

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:56 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joel Grimmett
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:55:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:12 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Colleen Gutierrez
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:11:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gloria A Guzman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:34:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:51 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jack Haesly
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:50:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Andrew Halbreich
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:17:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:28 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Linda Halbreich
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Finally, allow the Austin community to continue to work on the best ideas for spending 0 million in a way that would actually benefit Austin and Travis County commuters, while protecting our most vulnerable and essential water supplies. With rapid growth and a changing climate, it is essential that we build and invest our public and private dollars to steer development away from our most vulnerable and essential water supplies.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:27:57

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Julie Hall
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:18:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:40 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Miriam Hall
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:40:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mark S Hall
Email : [redacted]
Subject : Kindly request withdrawing SH 45 SW draft Environmental Impact Statement
Message : Dear Sir or Madam:

I am very concerned about the spur being considered for construction between I-35 and Mopac. I believe that this will further degrade the effectiveness of the Edwards Aquifer to adequately recharge itself - something that is already stressed by the rapid development of Central Texas. Water is the lifeblood of this region. We will suffer a collapse, both economic and environmental, should further large-scale projects such as this highway project.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Regards,

Mark

Mark S Hall
Austin, Texas
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:35:23

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:52 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Margaret Halpin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:52:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:29 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Tommy Joaquin Hancock
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bi rd Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternative s that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:29:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:42 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Yvonne Hansen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

I fervenetly urge you to promptly undertake an honest evaluation of alte rnatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:42:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : elizabeth harkey
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:25:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 7:33 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jan harrigan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : This 45 idea is craziness!

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 12:33:26

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:41 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Justin hennard
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:41:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:39 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jay Herman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:38:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:50 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jan Hester
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer. Barton Springs is an Austin treasure, and is a VERY special part of what makes Austin unique and wonderful. Barton Springs and our aquifer need help, not abuse. Please don't let more traffic ruin our beautiful springs!

Thank you for your consideration,
Jan C. Hester

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:50:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cindy Hill
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:17:09

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:52 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Roberta Hill
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:51:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:40 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sharon Hill
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:40:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Teresa Hodge
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:57:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Teresa Hodge
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:57:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:02 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joi Holcomb
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:01:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:45 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Linda Holder
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:45:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:21 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Margaret Holder
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:21:06

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:19 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Daina Holliday
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:19:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:34 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jason Holoubek
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I am not in favor of the draft Environmental Impact Statement on the proposed SH 45 SW toll road. The conversion of Mopac from a local commuter highway to an alternative Interstate 35 West is a horrible idea.

We have enough freeways and toll roads on the eastside. I-35 commuters do not need to be driving onto Mopac. I do not want further damage to the Barton Springs Edwards Aquifer.

Thank you.

Jason Holoubek
5106 ravensdale Lane
Austin TX
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 13:34:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:27 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cynthia L Houston
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:26:57

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:33 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chelsea Hovenweep
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:33:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:41 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joanna Howerton
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:40:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:36 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Richard Ian Howes
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:35:53

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Bruce Hughes
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

As a lifelong and native resident of this beautiful city, I respectfully request:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse interse ctions; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration. I love Barton Springs and the surrounding fresh waterways, and would hate to see them polluted anymore than they already have been by advanced traffic development.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:05:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:20 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Colin Ingarfield
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:19:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:09 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Glee Ingram
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 01:08:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:25 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gregory Ippolito
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:25:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:55 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : virginia Ivey
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:55:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:26 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mark jackson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 04:26:02

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:55 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Julie Jenkins
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:55:15

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:22 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Carol Johnson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:22:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:38 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lauren Johnson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 06:38:15

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:31 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Nathan Johnson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:31:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Michael Jones
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 02:55:25

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:08 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : John Joyner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:08:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:26 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Carolee Justus
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:26:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Steve Kahn
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:18:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Erin Kaiser
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 02:04:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:31 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kristin Kavanagh
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady B ird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternativ es that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:30:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:06 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : kate kavanagh
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:06:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : David Kepner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:04:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:06 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kay Keys
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:05:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:32 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Shakti Khalsa
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:32:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:38 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Thomas Kile
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:37:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:24 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : David King
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (a) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:24:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Diane Kloc
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

I utilized the Mopac Expressway almost everyday and traffic is packed and especially the bottleneck that exists at the Lady Bird Lake bridge. To move forward with SH 45 SW Phase I before determining what, if anything, can be done to eleviate this bottleneck only assures much worse traffic on Mopac and definitely more pollution of the "Barton Springs Edwards Aquifer". As our drought is severe and appears to likely continue in this manner, the Barton Springs Edwards Aquifer should be protected at all costs.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that k eep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an "honest" evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:17:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joanna Klose
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:17:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:56 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Julie
Email : Konvicka
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commut ers to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:56:02

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Nita Kostroski
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:56:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:32 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Karen Kreps
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

We don't need more toll roads. They only cause traffic congestion. Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South M opac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please p romptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:32:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:57 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Christian Kurtz
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:56:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:11 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Gina Lacey
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:10:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:53 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Damon
Email : Lange
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:52:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:39 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brad Langford
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 03:38:31

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:29 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Anna Langston
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:29:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:08 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dean Law
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:07:33

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Eric Lawrence
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:26:20

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:16 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chris Lehman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:15:59

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 7:18 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elizabeth Leight
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

There's too much cost for too little benefit.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 00:17:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:53 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Janice Leoshko
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:52:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Laura Leslie
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:23:02

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jerry Levenson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:01:22

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:28 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Leila Levinson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Those of us in Austin and all Texans have much to lose if Mopac becomes an alternative I35 instead of a local highway for commuting. We will lose the natural beauty and resources of the Edwards Aquifer and Barton Springs, heritages that are not ours for ruining. We will suffer transcontinental traffic, congestion, and noise that will add to the depreciation of the quality of our lives. I ask you to please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin communit y deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:27:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:13 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jane Lindsley
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:12:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:04 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : jennifer long
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 14:04:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Martin Luecke
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:03:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:19 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robbie Lueth
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:19:07

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:35 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Pamela Susan Luton
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

It makes no sense to have a plan that will essentially divert traffic from Interstate 35 onto Mopac, thus forever changing its status as a local commuter highway. Mopac is already maxed out at peak rush hour traffic times. Please take the time to find a better solution, rather than rush through a shoddy plan. To do this, your first step must be to withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road.

In doing so, you will also help to protect the Barton Springs Edwards Aquifer. And with the scarcity of water becoming an increasingly important issue, this is an action that demands to be taken.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:34:57

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:49 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : alice mabry
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:49:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Peggy Maceo
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:02:44

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:32 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lee Mackenzie
Email : [redacted]
Subject : Keep MoPac local - make I35 local - have through trucks use 45-130
Message : Dear TxDOT and CTRMA officials:

Please don't allow an explosion in development in the Barton Springs Recharge Zone

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse inte rsections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I- 35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Lee Mackenzie
3701 Basford Rd
Austin, TX 78722
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:31:59

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:16 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kathleen Magor
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:16:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:56 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kye Mansfield
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:55:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:44 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : David Mantia
Email : [redacted]
Subject : SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commu ters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:44:23

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jeremy mantooth
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:35:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:11 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elle Martin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 01:11:08

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:24 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sharon Martin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 03:23:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:34 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : alton martin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Alton Martin

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:33:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:38 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Richard Mason
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

The following represents the viewpoint of our household in opposing acceptance of the draft environmental statement.
Furthermore any expansion of existing freeway network in Southwest Austin should include an effective mass transportation infrastructure.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:38:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:20 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susanne Mason
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:19:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:03 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : jean allen mather
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:02:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Paula May
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:08:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:42 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lori McClure
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I urge you to withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an HONEST and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer. I drive this portion of roadway twice weekly and know firsthand of the traffic issues in play. Moreover, as a DAILY lap swimmer at Barton Springs for 30+ years, I have witnessed firsthand degradation of the water quality at Barton Springs. The pool and the aquifer are irreplaceable assets for Austin and the surrounding area. The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin comm unity deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer. PLEASE PROTECT THE INTERESTS OF THE MANY, NOT THE CONVENIENCE OF THE FEW… ALLL RESIDENTS OF AUSTIN FACE TRAFFIC ISSUES, PLEASE DO NOT SACRIFICE AN IRREPLACEABLE NATURAL

RESOURCE BECAUSE A SMALL PERCENTAGE OF PEOPLE CHOOSE TO LIVE IN OUTLYING AREAS AND GREEDY DEVELOPERS WISH TO DRAW MORE PEOPLE TO THESE AREAS THAN THE LAND OR THE AQUIFER CAN SUSTAIN.

Please step up and do the right thing for the good of our community!!!!

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 20 14-08-14 02:42:08

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Donna Beth McCormick
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:26:08

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:53 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Amelia McCoy
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Amelia McCoy

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:52:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:45 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Roy McCoy
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Roy McCoy

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:44:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:49 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susan McDonals
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I am heartbroken at the turn our city has taken with its unfettered construction and paving over of the aquifer. Our water supply is clearly already suffering.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Susan McDonald
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:48:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 7:08 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lisa McGiffert
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 12:08:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:58 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rojer McKar
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:57:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:50 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susan McKinney
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Susan

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:50:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:41 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sheri McKnight
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:40:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:04 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Judy McMillan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West. Already trucks are starting to use Mopac. Mopac is for local traffic and as a resident who lives near Mopac, I can tell you this plan is wrong.

NO ROADS OVER THE EDWARDS AQUIFER!!!

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) b uilding freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mop ac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:03:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:40 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kathleen McWhorter
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:39:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:58 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Bill Meacham
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 02:57:58

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:56 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jenny Meadows
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I can't say it any better than this.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughte r all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Colleen Mehner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:54:20

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:02 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Barbara/Bobbie
Email : Melder
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez w ith up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:01:50

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:23 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Madeleine Mercier
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:23:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : nancy millard
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:34:54

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:19 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Karen Miller
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:18:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:55 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : andra millian
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 14:54:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:38 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Samuel Minot
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 01:38:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susan Moffat
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:25:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:18 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elena Montalvo
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:17:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:29 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Christopher Moore
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:29:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:51 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : kay morris
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:50:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:06 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robert Morrow
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

TOO MUCH TRAFFIC ALREADY ON MO-PAC. AND I SURE DON'T WANT A NASTY, "TAX YOUR FOREVER" TOLL ROAD. AND I AM WORRIED ABOUT POLLUTION IN BARTON SPRINGS.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlane s and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while im proving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Robert Morrow
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:05:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Donna Morrow
Email : [redacted]
Subject : Please rethink SH 45 SW.
Message : Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Your current plan would be very damaging environmentally.

Thank you,
Donna Morrow
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:14:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : CC Mullen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:00:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:23 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Molly Munroe
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:22:44

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:17 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Edna Murray
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:16:44

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:27 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brian
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:26:47

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : David
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:24:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:38 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elenore
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:37:59

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:07 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chave z with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I -35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:07:06

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:49 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Matt
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:48:53

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Michael
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 01:00:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Wilbert
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:08:15

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:48 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : SUZANNE M. NAGLE
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:47:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:39 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Camille Nalle
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:39:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:02 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dr. Craig Nazor
Email : [redacted]
Subject : Please withdraw the deeply flawed SH 45 SW draft EIS
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Your current environmental analysis is, at best, incomplete. Unlike politics, science brooks no compromise. One cannot repeal the law of gravity, or change the physical properties of mass. An environmental analysis cannot be based on incomplete information, assumptions not based on the most current discoveries, or political expedience. Your analysis is rife with all three. The current name for that is greenwashing.

TxDOT and the CTRMA are cur rently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Stop the greenwashing NOW! Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards

Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:02:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:18 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Desmond Ng
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:17:47

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Truc Nguyeb
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:35:01

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:50 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rex Nunnally
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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S
The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

So many boondoggles have been dropped on the weary and impoverished taxpayer. It seems that each time there is some "improvement" , things are worse and we have to endure higher taxes for nothing. Please wait and be absolutely sure that this is the right thing to do.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:49:53

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:20 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Janel Nye
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:20:06

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:33 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ben Obregon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:32:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:39 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lindsay Olinde
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 03:38:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Richard Orr
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration and please don't forget to take care of your own in city/county residents too.
Richard Orr

PS - Saw some info about a rail line that's going to run from South Austin (near Airport) up to Downtown.

Where were we in that discussion??????? Sure makes a lot more sense for the environment than encouraging even more 1 person cars to sit in Mopac traffic after driving on yet another new Texas Toll Road. We should be striving for LESS cars, not more. PLEASE. PLEASE. PLEASE. Mass transit works....

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:08:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:50 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Marco Orrantia
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:50:10

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:34 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rusty Osborne
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 03:34:17

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:22 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Anwar Osmany
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

If all else fails, make sure there are overpasses built at La Crosse and Mopac and Slaughter and Mopac!

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:21:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:20 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Margaret Paine
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:19:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:36 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Martin Parker
Email : [redacted]
Subject : Request to withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

As a daily user of Mopac Northbound from Circle C, I am adamantly opposed to SH 45 SW. From cutting across a nearly pristine, sensitive karst region to the formidable constraints along Mopac culminating at the Lady Bird Lake bridge, success for SW 45 appears to be dangerously optimistic for a project of its size its regional impact at so many levels.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

The traffic, financial, environmental and social impacts of building SH 45 SW a nd expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Martin Parker
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:36:18

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Aaron Parks
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:53:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:42 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brad Parsons
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:42:09

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:19 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Susan Pascoe
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 03:18:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:39 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Stephanie Patteson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 01:38:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:40 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rick Pearson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:40:10

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:13 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lindsey Peebles
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:12:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jason Perez
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:13:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:23 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Julie Perkins
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I know road improvements need to be undertaken, but please do not allow the SH 45 SW toll road to connect Brodie Ln. to Mopac WITHOUT FIRST converting the Mopac/Slaughter Ln and Mopac/Lacrosse intersections into over or underpasses so that the traffic jam on Brodie is not simply moved from one location to another (more damaging to Barton Springs) instead of alleviating it.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern termi nus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:23:09

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cindy Phillips
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:14:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:24 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Chris Pomeroy
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:24:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:26 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Richard Pooper
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 02:26:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Deborah L Potter
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 11:45:55

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:21 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Herman Prager PhD
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an comprehensive analysis of the project: the conversion of Mopac to an "alternative Interstate 35 West".

Congestion will not be relieved. It will become worse.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:21:24

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:09 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Elizabeth Quigg
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:08:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:02 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : david race
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

Moving I-35 traffic to MoPac will make it just as dangerous and frightening to drive on as I-35 will push more and more people onto surface streets, creating an even bigger mess.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a loc al commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:02:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:50 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Donna Ramsey
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

The methods of those who are pushing for a quick building of SH 45SW has been questionable, to say the least. Please put the brakes on their recklessness and take the time to do proper environmental and social impact studies.

Thank you for your consideration.

Donna Ramsey in Austin
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:50:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Clotilde Rea
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:24:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Clarissa Reburn
Email : [redacted]
Subject : Please do not build any more roads in the recharge zone. We need our water
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternati ves that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:53:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 5:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ray Reece
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 22:01:22

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 6:20 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Ray Reece
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 23:19:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:29 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Janet Reed
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:28:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Luis Reyes
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 01:17:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:42 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : yvette reynolds
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird L ake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives th at do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 01:41:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:47 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : John Ribble
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:47:26

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Wesley Robinson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I am writing in opposition to SH 45 SW and am asking that you consider investing in other alternative transportation options for commuters from Hays County that is more consistent with the City of Austin's long-range transportation plans.

Traffic on Mopac is already excessive and adding another 20,000 cars a day to it will not improve the local commute times of most residents in western Travis County. The traffic studies that have been released indicate that even if SH 45 SW is built, traffic on Brodie Lane and other local surface streets will not improve any compared to their current levels. When TxDOT tells people that SH 45 SW is going to "reduce" traffic, it just is not true as the traffic studies indicate that traffic is going to get worse on these roads regardless of whether or not SH 45 SW is built.

From the CAMPO Draft Dynamic Traffic Study at page 14 of 26:

Under the no-build scenario, travelers from Travis County primarily use southbound I-35 to reach their destinations in Hays County. After the construction of SH 45 SW, a significant proportion of these travelers started using SH 45 SW to reach their destinations. These travelers accessed eastbound SH 45 SW through Loop 1 or though RM 1826 and SH 45 S. It also reduced travel times by two to three minutes (4 to 12% reduction) and route lengths by 1.5 miles (7 to 9% reduction) between the start and endpoints shown above.

Commuter rail from northern Hays County into downtown Austin and beyond is a much better solution to the area's transportation problems. Continuing to subsidize the single-occupant vehicle by building big highways like SH 45 SW has proven to be an ineffective solution to traffic congestion. You just can't build roads fast enough to solve this problem in a city as congested (and with such limited free space). See http://www.wired.com/2014/06/wuwt-traffic-induced-demand/.

Furthermore, the draft EIS is incomplete. At many critical points, the EIS acknowledges that it does not yet have enough information to reach a conclusion on important environmental impacts to this sensitive area sitting

over the drinking water of tens of thousands of residents. As request by the City of Austin's City Manager, please withdraw the EIS and prepare a comprehensive EIS. When Gerald Daugherty devised his plan to shift federal dollars to other road projects and to replace those dollars with other funding sources so that TxDOT and CTRMA were not obligated to perform a federally-compliant environmental impact study, residents were promised that the EIS would be thorough and performed to standards higher than those required by the federal government. The current draft EIS has been rushed through the process and is inconclusive on many important issues. Finish the work. Do the study that we were all promised instead of this incomplete draft EIS so that we may comment on a completed EIS, not one that is inconclusive.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your attention to this matter.

Wesley Robinson
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:45:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Rob Roeder
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:56:47

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Amy Rowland
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 17:08:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:46 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Virginia Rowland
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bir d Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 14:45:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:38 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : andrew rumelt
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:38:17

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:54 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Camille Saad
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:54:21

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:45 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Aletha SaintRomain
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:44:47

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:08 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Deanne Salazar
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:08:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:37 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Shelley Sallee
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:37:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:25 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : morris sandel
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:24:51

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:07 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jacob Scheick
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:06:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:24 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : kyle schneider
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 10:24:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dorinda Scott
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:54:42

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:19 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Niles Seldon
Email : [redacted]
Subject : SH 45 EIS
Message : Dear transportation officials,

I am not satisfied with the draft Environmental Impact Statement on SH 45 SW toll road. We need a thorough, comprehensive analysis of not only SH 45 itself, but how the transportation will affect the entire region with its sensitive environmental features.

Thanks
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:18:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:53 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robert Shadowen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:52:49

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 12:55 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brigid Shea
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I am writing as a soon-to-be member of the Travis County Commissioners Court to urge you to engage in an honest, legitimate study of the environmental impacts of SH 45 SW--and further to inquire whether we even need this road at all. TXDOT Executive Director Joe Webber was quoted in a recent story about Deputy ED John Barton's plans to make the state's system better prepared for transformative technologies such as Google's driverless cars. Weber is quoted in support of the visionary plans saying: “It’s not our future but the future of our children and grandchildren, and we need to spend some time and resources on this." That is exactly my view about SH 45 SW. The embarrassingly inadequate DEIS sh ould be shelved and the entire project examined in light of Barton's proposals to study how our transportation systems will evolve with new technologies.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aqui fer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 05:55:06

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:51 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Molly K Sheehan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:50:48

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sarah Sheffield
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:26:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:15 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Robin H Shepperd, D.C.
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bir d Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:15:18

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 3:10 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lee Sherman
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Our springs are too valuable to jeopardize their health with polluted highway runoff, destroyed karst features, and overall environmental degradation. Furthermore, toll roads have proven ineffective in reducing traffic congestion in Austin and could make it worse on Mo-Pac. The Highway 45 Southwest project should be abandoned.

-Lee

Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piec emeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 20:09:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:57 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Francie Shimaya
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:57:23

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:04 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Randy Simmons
Email : [redacted]
Subject : SH 45 deis
Message : To TxDOT and CTRMA officials:

This project is obviously part of a bigger plan to connect mopac to I35 where 130/45 currently ends into i35. There is ample state owned ROW on the west side of I35 at that location to allow construction of a major interchange. Further looking at a map and the four proposed project in the TIP you can see that there's only one missing link. When will this "missing" link be included in the TIP? If the plan was to use mopac to service buda residents why have the sh45 project be southwest instead of north south. It's obvious what the intention is here and it's shameful that you believe the general public will be too naïve to notice. Pleas study this entire project as a whole, including build date traffic along the entire corridor from where it will connect With 35 to mop acd northern terminus. Evaluating little pieces will likely end up missing a big overall impact that could cause harm to the precious Edwards aquifer fresh water. Don't be dicks, do the right thing. CTMRA, looking at you guys here!
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 00:03:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:30 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : cicily j simms
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:29:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:24 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jose Skinner
Email : [redacted]
Subject : SH 45 SW draft Environmental Impact Statement Needs to be Broadened
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:23:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:00 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Steve C. Smith
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:59:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:42 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Sarah Snow
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:42:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:44 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : jeffrey solomon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:43:36

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Alex Solonenko
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of a comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake a thorough evaluation of alternatives that do not divert I -35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:05:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:52 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mary Somerville
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:51:40

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 10:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lin Spatcher
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 15:24:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:13 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Soo Spaw
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:12:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:29 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Jamie Spinello
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that d o not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:29:02

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:51 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : D. Spradley
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:51:20

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:14 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : alfred st. louis
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

The Edwards Aquifer is very low now after several years of drought, so water is becoming scarce. Why threaten the aquifer with a new toll road with so little benefit? Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tol led) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter hig hway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:13:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:35 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : carol stall
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:35:10

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Peter Steinhardt
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:13:52

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:03 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Peter & Dolores Stern
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

The Austin members already voted no on this measure and yet the Mayor decided to override what they and the people said. Most of us do NOT want the road as a toll road especially.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that k eep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:03:13

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 6:15 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : briana stone
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 23:15:11

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:38 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Hal Strickland
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:38:02

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:10 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Lucina Stricko
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives tha t do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:09:59

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 5:30 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : johanna sullivan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bir d Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 22:29:33

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Johanna Sullivan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bir d Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 01:35:00

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:02 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : patrice sullivan
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:
PLEASE take time to really evaluate these Mopac Extension proposals thoroughly. Alternatives to toll roads along Mopac MUST be considered -and options to improve I 35 flow as well- before creating a pollution nightmare over our aquifer.

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the wh ole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:01:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 1:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Monroe Talley
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake t o Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 18:53:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:38 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Colleen Theriot
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Human beings have a way of pushing the envelope to the brink before pulling back to sanity - or not. When they don't, you get things like the BP oil spill, the sinking of the Titanic, and the explosion of the space shuttle Challenger. We are at such a moment now with the ill-advised SH 45 SW toll road. Longterm regret and heartache for short-term, imagined traffic "relief" plus fat profits for people who would sell their own mother in pursuit of the almighty dollar.
Please don't do this to your children and theirs. Please don't gamble with the heart and soul of our city - our precious Barton Springs - or our aquifer. In a place so threatened by drought?? This makes less sense than the 2011 spri ng release of water from the Highland Lakes, which has put so many in our community into terrible hardship. That won't happen again either.

I respectfully ask you to please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II fro m FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that

keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:38:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:30 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mikaela Thomas
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bir d Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Mikaela Thomas

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:30:04

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:05 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : T Thomas
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chav ez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:04:34

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:35 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : phil thomas
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:34:56

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:55 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : David Thompsom
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:55:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:04 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Mark Thompson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:04:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:25 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Scott Thomsen
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:24:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Paul Thrailkill
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:01:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:07 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : john tongate
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:07:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Thursday, August 14, 2014 12:00 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Carol Torgrimson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

I am writing to ask you to please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road. The draft EIS is inadequate and erroneous.

I served on the Imagine Austin Comprehensive Plan Citizens Task Force on behalf of the Travis County Commissioners Court. While working on that plan, we investigated the impact of the SH 45 SW on the Edwards Aquifer and specifically on Barton Springs. The scientific information clearly demonstrates the environmental damage which would be caused by the completion of SH 45 SW. The draft Environmental Impact Statement does not properly address that damage.

Furthermore, in studying the impact on current traffic congestio n of SH 45 SW, it was evident to us that this is not a reasonable approach toward addressing the issues. The real impact of SH 45 SW would be to degrade Mopac to the point of being another Interstate 35, without significantly easing congestion. The bottleneck on Mopac at the Lady BIrd Lake bridge would be made considerably worse, and the introduction of heavy truck traffic on an already maxed out Mopac will create new safety issues.

Clearly there have been inadequate efforts to seek out better alternatives than converting Mopac from a local commuter highway to another Interstate 35 mess. The failure of SH 130 to draw through traffic away from I-35 should be considered before going forward with SH 45 SW. While there is much hue and cry from those who are currently victims of the traffic congestion on I-35, there needs to be better evaluation of alternatives before pushing forward with SH 45 SW.

Please consider alternatives that would address traffic con gestion without destroying Mopac and endangering the Edwards Aquifer.

Thank you for your consideration.

Sincerely,

Carol Torgrimson
Vice President, Transportation
2222 Coalition of Neighborhood Associations, Inc. (2222 CONA)
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:59:33

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:56 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Peter Torgrimson
Email : [redacted]
Subject : Please abandon the flawed SH 45 SW Environmental report
Message : I urge you to abandon the flawed draft Environmental Impact Statement for the proposed SH 4highway. We don't need another biased "environmental study". What we need is a real-science comprehensive assessment of the environmental factors. We also need a real science-based comprehensive assessment of the impact on area traffic, particularly on MoPac.

We do not want to destroy key elements of Austin, such as Barton Springs Pool. We do not want to destroy Austin to make it more convenient for people outside of Austin to be able to drive to downtown Austin marginally more conveniently.

We need to develop Austin while not destroying it. SH 4r5 SW is not part of the solution. It is part of the problem.

Peter Torgr imson
Austin, TX 78730
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 04:56:14

Don't mess with Texas® means don't litter.

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:43 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Natalie Turner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:43:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 1:10 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : apryl v
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not di vert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 18:10:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 8:55 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Pat Valls-Trelles
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 13:55:03

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:09 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : alejandra vela
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 04:08:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:57 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Caroyn Vogel
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:56:37

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:01 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Candace Volz
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West. My family and I live 2 blocks from "MoPac Blvd." and we don't want the increased air pollution, the noise (is MoPac the only inner city freeway in the US without sound walls?), or the environmental damage to the Edwards Aquifer- already stressed by increased water demands and development in Central TX.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer. Put light rail down MoPac, and interregional rail down I-35. Increase volume that way, not with more lanes and more pollution.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:01:19

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:17 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : joan wade
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

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Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:17:12

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:45 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kurt Waldhauser
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:44:31

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Suzanne Walrath
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bi rd Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternative s that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:26:23

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 11:26 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : William Weaver
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 16:25:46

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 2:47 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Shelley Weedon Trepanier
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternati ves that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 19:46:43

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:32 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Adam Weinroth
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:31:32

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:26 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Dianne Wheeler
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West. There is no reason to shift Hays County residents off of IH 35 onto an already-overcrowded municipal thoroughfare.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep M opac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer. Water is our most valuable resource in Central Texas; please do not build SH 45 without much more study of the quality of life issues of fresh water and transportation for those of us who live along the Mopac corridor.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:25:41

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:27 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Kaiba White
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:26:38

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:05 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Pat Whiteside
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not div ert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 14:04:39

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:35 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Cynthia Wilcox
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesa r Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not d ivert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:34:30

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 2:28 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Eric Wilkerson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do n ot divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration, I hope you will respect the will of the community and help try to maintain positive quality of life in Central Texas.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 19:28:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 12:54 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Michael Williams
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird La ke to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

Plus we don't need another toll road!

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly u ndertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 17:54:28

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:36 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : don a. williamson
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bi rd Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternative s that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:35:45

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 3:20 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Brooke Wilton
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 20:20:10

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:47 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Charles Witt
Email : [redacted]
Subject : Wthdraw SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I- 35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Charles
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:47:27

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 4:17 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Michael Wolszon
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to C esar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do no t divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 21:17:09

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 8:06 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Max Woodfin
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear Texas Department of Transportation and Central Texas Regional Mobility Authority officials:

Please withdraw the draft Environmental Impact Statement on the proposed State Highway 45 Southwest toll road.

This road would be a disaster for our water supply. Please don't place convenience ahead of health.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 13:06:14

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:04 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : doug young
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar C havez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not dive rt I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:04:25

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 4:23 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Joe Zakes
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Ch avez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not diver t I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-13 21:23:29

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 7:02 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Shi Zhong
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 12:01:36

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 9:42 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Leigh Ziegler
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lak e to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 14:42:16

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 10:53 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : ricardo zuniga
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ce sar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter and interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 15:53:05

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Wednesday, August 13, 2014 9:20 PM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Stuart Werbner
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Ces ar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

Mopac traffic is already maxed out, especially at the bottleneck that exists at the Lady Bird Lake bridge. Moving forward with SH 45 SW Phase I before figuring out what, if anything, can be done to this bottleneck only assures much worse traffic on Mopac and more pollution of the Barton Springs Edwards Aquifer. The last thing we need is another source of traffic on Mopac!!! What a self-defeating concept now that the new toll lane is being completed.

The traffic, financial, environmental and social impacts of building SH 45 SW and expanding Mopac from Cesar Chavez to the southern terminus must be studied before taking the first step. The Austin community deserves, and sound planning requires, that we analyze the whole picture – including viable alternatives that keep Mopac a local commuter highway while improving commuter a nd interregional traffic flow along the I-35 corridor.

Please promptly undertake an honest evaluation of alternatives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.

Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-14 02:20:23

From: Keep Mopac Local [mailto:info@keepmopaclocal.org]
Sent: Tuesday, August 12, 2014 11:14 AM
To: Carlos Swonke; Stacey Benningfield; [redacted]
Subject: Citizen comments on SH45 Southwest

The following message was sent via the website KeepMopacLocal.org.

Name : Texans Against Tolls
Email : [redacted]
Subject : Please withdraw the SH 45 SW draft Environmental Impact Statement
Message : Dear TxDOT and CTRMA officials:

Please withdraw the draft Environmental Impact Statement on the proposed SH 45 SW toll road in favor of an honest and comprehensive analysis of the real project: the conversion of Mopac from a local commuter highway to an alternative Interstate 35 West.

TxDOT and the CTRMA are currently pursuing this conversion of Mopac to I-35 West in piecemeal fashion, with the 4 mile segment of SH 45 SW over the Barton Springs Edwards Aquifer recharge zone as just one of four pieces. The other pieces include: (1) building freeway (or tolled) mainlanes and bridges at the Mopac/Slaughter and Mopac/LaCrosse intersections; (b) expanding South Mopac from Slaughter all the way north, across Lady Bird Lake to Cesar Chavez with up to four toll lanes (2 in each direction); and (c) building SH 45 SW Phase II from FM 1626 to I-35 and SH 45 SE.

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Please promptly undertake an honest evaluation of alternat ives that do not divert I-35 commuters to already overwhelmed Mopac or further pave and pollute the Barton Springs Edwards Aquifer.

Thank you for your consideration.
Withdraw SH45 SW draft EIS :
Entry Date : 2014-08-12 16:14:21

Keep MoPac Local Forms

S.O.S.

SAVE OUR SPRINGS ALLIANCE

August 13, 2014

Texas Department of Transportation
Austin District
Attention: Stacey Benningfield
P.O. Box 15426
Austin, Texas 78761-5426

CMR 7013 1090 0000 4339 2431

Re: Comments on State Highway 45 Southwest

Dear Ms. Benningfield:

Enclosed please find approximately 350 keepmopaclocal.org comment cards from citizens concerned about the proposed SH 45 SW project.

If you have any comments or concerns please feel free to contact me at 512.477.2320 ext. 305 or by email at adam@sosalliance.org.

Sincerely,

Adam Abrams

Adam Abrams
Staff Attorney

(512) 477-2320 voice
(512) 477-6410 fax

Save Our Springs Alliance
P.O. Box 684881 • Austin, Texas 78768
905 West Oltorf Street, Suite A • Austin, Texas 78704

http://www.sosalliance.org
email: sosinfo@sosalliance.org

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: LAURA PRESCOTT

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

Please respect the comments and policies of the City of Austin to steer new development away from the Barton Springs Edwards Aquifer watershed.

I swim at Barton Springs and believe that this treasure should be protected from more pavement and pollution from highway or toll road development. Our limited transportation dollars should be invested supporting development in preferred growth areas to the east and downstream of the Barton Springs Edwards Aquifer.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Brandy Caswell

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Neal Tuttrup

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Keith Knedlik

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Joey Delahoussaye

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: R. Shane Evans

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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R. Shane Evans

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Barbara Rush

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

Please respect the comments and policies of the City of Austin to steer new development away from the Barton Springs Edwards Aquifer watershed.

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: LAURA LESLIE

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kyu Park

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Alex Wong

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jeff Hastings

Address: [redacted]

Email [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Joseph Merchant

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: PAUL SUSUICO

Address: [redacted]

Email: [redacted]

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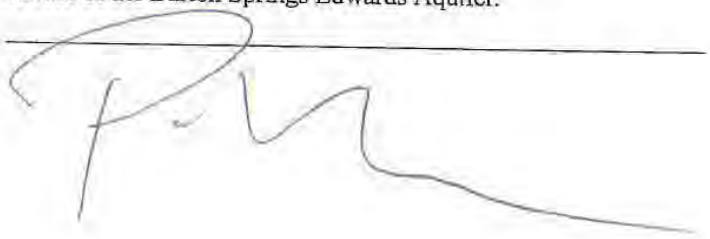

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sarah Richardson

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Joachim Hubele

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lauren Hubel

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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L Hubel

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: H. Hall

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Whitney Blandford

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Patty Koenig

Address: [redacted]

Email: [redacted]

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Patty Koenig

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Martha Spetseris

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Molly White

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Gatling

Address: [redacted]

Email: _____

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Gatling

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kathleen Sanders

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Kathleen Sanders

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Steve Schnabel74

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Dan Inman

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Gretchen Inman

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jerry Pinatare

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Candace Pinataro

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lee Wallace

Address: [redacted]

Email: [redacted]

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Lee Wallace

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Marcia Lucas

Address: [redacted]

Email: [redacted]

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Marcia Lucas

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JAN ADLER

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Matthew Kleinman

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: KEVIN FRENCH

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Katherine Byers

Address: [redacted]

Email: [redacted]

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Katherine Byers

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Linda Zimmer

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Scott Hume

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sara & Colin Clark

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Daniel Whitney

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Suzanne Litz

Address: [redacted]

Email: [redacted]

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From: [redacted]

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Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Cameron Taylor

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jesse Broda [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Angela Schaft

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Adam Delano

Address: [redacted]

Email: [redacted]

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Adam Delano

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Connor Stephens

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: ED MORRIS

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kelli Shelly

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: TAZE JESSEE

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Pascal Barczak

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Richard Reel

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kristy Kormanik

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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I swim at Barton Springs and believe that this treasure should be protected from more pavement and pollution from highway or toll road development. Our limited transportation dollars should be invested supporting development in preferred growth areas to the east and downstream of the Barton Springs Edwards Aquifer.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Michele Byers

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Amy Napier

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: AL DiAmico

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Marshall Collins

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Neil Gandhi

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Elisha Adey

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Katherine Keegan

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: MATTHEW VITEMS

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Winston Wright

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: John Hill

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Jason Connelly

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Audrey Cravotta

Address: [redacted]

Email: [redacted]

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Audrey Cravotta

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stephen Ramirez

Address: [redacted]

Email [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Adam Abrams

Address [redacted]

Email [redacted]

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Adam Abrams

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Andrea Garcia

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: David Weinstein

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Mark Perez

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Frances Bdamos

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Laura Cattoor

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Trace Kelly

Address: [redacted]

Email: _____

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Eric Butler

Address: [redacted]

Email: [redacted]

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Eric Butler

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Isaura Segura

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: JORGE TABOADA

Address: [redacted]

Email: _____

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JTaboada

F. (512) 803-5123

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: BRIAN PION [redacted]

Address: [redacted]

Email: [redacted]

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THIS PLACE IS SACRED, PLEASE READ THE BOOK "BREATHING UNDERWATER" BY SUSAN BRIGHT

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Kathy Lin

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lonnette Williamson

Address: [redacted]

Email: _____

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Lonnette Williamson

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Taylor Nelson

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Deborah Todd

Address:

Email: [redacted]

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Deborah B. Todd

It's the soul of Central Texas!

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: _____

Address: [redacted]

Email: _____

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_____

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Daniel Taylor

Address: [redacted]

Email: [redacted]

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Daniel Taylor

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Allison Robertson

Address: [redacted]

Email: N/A

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Athalya Johnson

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Yvonne Bohanan

Address: [redacted]

Email: [redacted]

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Yvonne Bohanan

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Ashley Prevost

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Tim Kopp

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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I swim at Barton Springs and believe that this treasure should be protected from more pavement and pollution from highway or toll road development. Our limited transportation dollars should be invested supporting development in preferred growth areas to the east and downstream of the Barton Springs Edwards Aquifer.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sarah Faust,

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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Sarah Faust

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: SHAY FITZGERALD

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Shay Fitzgerald

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Taylor Washington

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Taylor Washington

Keep Austin Beautiful!

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kathleen Dolt

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Kathleen Dolt

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Rachel Warburton

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426

From: OLIVIA SWALES

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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PLEASE NO

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jaclyn Georges

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Don Campbell

Address: [redacted]

Email: [redacted]

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Don Campbell

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Valerie Faglin

Address: [redacted]

Email: _____

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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-Best,
Valerie Faglin

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: LAURA LESLIE

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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YES, PLEASE! WE NEED TO PROTECT OUR WONDERFUL WATER RESOURCES LBLeslie

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Patty

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Granville Lee

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: James Lee

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Elizabeth Lorada

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Please and thank you,

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District.
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Seiro Perez

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jessica Brettle [redacted]

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: KRISTINA SHEVORY

Address: [redacted]

Email: [redacted]

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Enough w/ over developing Austin!

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Ben Beesley

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Haley Beesley

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Leidre Gott

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Janet Hardy

Address: [redacted]

Email: [redacted]

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Janet Hardy

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Aimée Reddick

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Liz McDowell

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: David Ruiz [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Michael Fields

Address: [redacted]

Email: [redacted]

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Michael A Fields

No Toll!!

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Christine Oen

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District.
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kat Meinkoth [redacted]

Address: [redacted]

Email: [redacted]

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Kat Meinkoth

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Amber Baker [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sarah Evans

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Michele Pain

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stacey Campbell

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District.
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Matt Jeffers

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: McKinzie Crossland

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Marilyn Faulkner

Address: [redacted]

Email: [redacted]

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---

please consider and respect our natural wonders and gifts, specifically the springs & Edwards Aquifer that feeds it.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: REBECCA SALTSMAN

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lynda Price

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Colleen Conrad

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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Colleen Conrad

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jill Montgomery

Address: [redacted]

Email:

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Jill Montgomery

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kat Becerra

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: John Kouch

Address: [redacted]

Email: [redacted]

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John Kouch

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sydney Carter

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District.
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: KATHY FRAN

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Gretel Kay

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Steve Lamm

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: KRISTINE KOVACH

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JAH ADLER

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Monica McGarrity

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Melanie Gonzales

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stephanie Harris

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Dion Sullivan

Address: [redacted]

Email: [redacted]

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Dion Sullivan

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Leslie Davis

Address: [redacted]

Email:

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Leslie Davis

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Alex Sanders

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Austin TX

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Andrew Cox

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Yvette Bahrassian

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Lisa Berry [redacted]

Address: [redacted]

Email: [redacted]

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Lisa Berry

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Geoval V. McGee

Address: [redacted]

Email: [redacted]

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From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lara Reichmann

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Michelle Nguyen

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Holly Kirk

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Darius Madsen

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Michael Silver

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Elle Kuss

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: DAN THOMPSON

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Claudia Thompson

Address: [redacted]

Email [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Rachel Lavin

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Tevez Drushow / Houston TX

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Christina Hoesan

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jessica Deutsch

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Allan Kohler

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Daniel Bennis [redacted]

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Mara Ellison

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JASON SABO

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Rebecca Turnbow

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lisa Kerbe

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Susan Hartnett

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Bill Vick

Address: [redacted]

Email: _____

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sandra Bruce

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Sandra Bruce

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Benjamin Breault

Address: [redacted]

Email:

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Marcela Vega

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Elly van Laar

Address: [redacted]

Email: [redacted]

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+ Developing public transportation
+ Working in shifts to spread work-home traffic
+ Supporting teleconferencing, etc. to decrease work-home traffic

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Brian Jeanes

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: J London

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Margaret Miller

Address: [redacted]

Email: [redacted]

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Margaret Miller

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lakshmi Jayakumar

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: William Phar. IV

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Marie Thundel

Address: [redacted]

Email [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Marie Thundel

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sue Yee

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Drew Brooks

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: HONGSUP SHIN

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Gabriel Bicker

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Pat Gordon-Bradway

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Ted Garza

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Brenda DeMuchio

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Daniel Kelly

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Adam Galvan

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Dorna Haseny

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Owen Platt

Address: [redacted]

Email:

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Attention: Stacey Benningfield,
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From: Diego Morene

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Esther Weiss

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Andrew Napolitano

Address: [redacted]

Email: [redacted]

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Andrew Napolitano

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JILLIAN GIBSON

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Owen DeGrave

Address: [redacted]

Email: [redacted]

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Owen DeGrave

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lewis McLemore

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Paul Shirley

Address [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stephanie Kwiatkowski

Address: [redacted]

Email: [redacted]

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Thanks! ☺

Stephanie Kwiatkowski

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Katie Bennis

Address [redacted]

Email: [redacted]

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Katie Bennis

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Ryan Butler [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jennifer Graville

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

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I swim at Barton Springs and believe that this treasure should be protected from more pavement and pollution from highway or toll road development. Our limited transportation dollars should be invested supporting development in preferred growth areas to the east and downstream of the Barton Springs Edwards Aquifer.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Manera Helvenston

Address: [redacted]

Email: _____

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Don Henderson

Address: [redacted]

Email:

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Eamon Ould

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Eric Roehm

Address: [redacted]

Email: [redacted]

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Eric Roehm

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Brian Newcomb

Address [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Steven Buehler

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Scott Gerhardt

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Felix Brosovsky

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kelly White

Address: [redacted]

Email: [redacted]

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Kelly White

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Quinn McCarthy

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Rebecca Gutierrez

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Joel Abdullah

Address: [redacted]

Email: _____

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_____

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sam B. [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Erin Givarz

Address:

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Helen Chin

Address: [redacted]

Email: [redacted]

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From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: RICH JOHNS

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: ROBIN FLOWERS

Address: [redacted]

Email: [redacted]

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Robin Flowers

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Alex Gilbert

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Alexandra McGonagle

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sophia Palmira-Ross

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Lewis McCreary

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: SOBHAN ALITANOLI

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JUSTIN MAHONE

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Carson Barker

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Divinity Vela

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Michelle Janssen

Address [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Nancy Lord

Address: [redacted]

Email: [redacted]

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From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Mariana Fuller

Address: [redacted]

Email: _____

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_____

8/9/14

I want my Grandchildren to swim here too.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Benjamin Velazquez

Address: [redacted]

Email: _____

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Attention: Stacey Benningfield,
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From: [redacted]

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lindsey Worthington

Address [redacted]

Email: [redacted]

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Lindsey Worthington

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Matt Miller

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kiernan Hopkins

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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Kiernan Hopkins

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Evah Rees

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Bert Kraus

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Robbin Trusty

Address: [redacted]

Email: [redacted]

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Robbin Trusty

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Charles W. Kaough

Address: [redacted]

Email: [redacted]

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History - More, bigger roads = more bigger traffic jams. It's time to think about transportation differently. Charles W Kaough

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JOE CATERINE

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Barton Geurie

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JAY NOYD

Address: [redacted]

Email: [redacted]

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Jay Noyd

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Chaz Cearley

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Alex Nienhuis

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Dana Vanek

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Marian Meerschig

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jacques Caspi

Address: [redacted]

Email: —

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From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Meredith Tyler

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Mitchell Tucker

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Maria Leon

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Michelle Leon

Address: [redacted]

Email: [redacted]

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Michelle

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Erika Mendoza Sanchez

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Adam Lazar

Address: [redacted]

Email: [redacted]

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From: Eric Machintosh

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Robert Palestina

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Eric Stolz

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Thales Smith

Address: [redacted]

Email: [redacted]

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Thales Smith

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stephanie Hamborsky

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lauri Knedlik

Address [redacted]

Email: [redacted]

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Lauri Knedlik

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: RICHARD SWIFF

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Nicolas Mendoza

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Rico Morris

Address: [redacted]

Email: [redacted]

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From: [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Cara Alexandra Straus

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Rose Jenkins

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Sharon Bourbonnais

Address: [redacted]

Email: [redacted]

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Sharon Bourbonnais

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Tammy West

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jonathan Hesse

Address: [redacted]

Email: [redacted]

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From: Cameron Kitson

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jackie Billie

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Nico Escalante

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Stephanie Hart

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Eduardo Sanchez

Address: [redacted]

Email: [redacted]

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T.X.D.O.T.
RECEIVED
AUG 0 6 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Raymond Goodrich

Address: 1464 Red Bud Trl, 78746

Email: rgoodrich 70 austin.rr.com

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Raymond Goodrich

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Samantha Marshall

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Irene Mathiesen

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Victoria, Tx.

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Richard Casteel

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Ed Nev

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Pierce Burns [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Beth Busse

Address: [redacted]

Email: [redacted]

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Elizabeth D Busse

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: GARY LAFAYETTE

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

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Gary J Lafayette

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Aaron Schwartz

Address: [redacted]

Email: _____

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Alecia Norman

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Lincoln Hutchins

Address: [redacted]

Email: [redacted]

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From: GARY LAFAITE

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Kevin Opp

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Casey Prichard

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Adam Rutgers

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Nicole Conner

Address: [redacted]

Email: [redacted]

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Nicole Conner

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: JOHN MINNICH

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Alexander Brian Valdez [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Jon Ruben

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lynn Ramirez

Address: [redacted]

Email: [redacted]

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Lynn Ramirez

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Bobbie Melder

Address: [redacted]

Email: [redacted]

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Bobbie Melder

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Alyssa Foster

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Joel Reese

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Meredith Morse

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Lisa Paul

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Carol Lynne Smith

Address: [redacted]

Email: [redacted]

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D

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Robin Schneider

Address: [redacted]

Email: [redacted]

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This project should not be rammed through.

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Leslie Pool

Address: [redacted]

Email: [redacted]

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From: [redacted]

Address: [redacted]

Email: [redacted]

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[redacted]

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Nicole Brandt

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Wendy King [redacted]

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Judith Moraan [redacted]

Address: [redacted]

Email: [redacted]

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KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Doug Spaeth

Address: [redacted]

Email: [redacted]

RE: Comments on draft Environmental Impact Statement for proposed SH 45 SW toll road

Dear TxDOT,

Please withdraw the draft environmental study for the proposed SH 45 SW toll road and pursue other options that protect the Barton Springs Edwards Aquifer and steers traffic away from Mopac.

Please respect the comments and policies of the City of Austin to steer new development away from the Barton Springs Edwards Aquifer watershed.

I swim at Barton Springs and believe that this treasure should be protected from more pavement and pollution from highway or toll road development. Our limited transportation dollars should be invested supporting development in preferred growth areas to the east and downstream of the Barton Springs Edwards Aquifer.

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: PAUL VIOLAND

Address: [redacted]

Email [redacted]

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From: Lonnie Scleranci

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
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From: Tara P. H

Address: [redacted]

Email: _____

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From: Greg Vinson

Address: [redacted]

Email: [redacted]

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Greg Vinson

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Luiza Browning

Address [redacted]

Email: [redacted]

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Luiza Browning

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: Walt Harrison

Address [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Tiffany Horton

Address: [redacted]

Email:

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: William Town

Address: [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
P.O. Drawer 15426, Austin, TX 78761-5426.

From: Kristen O'Brien

Address: [redacted]

Email: [redacted]

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Kristen O'Brien

KeepMopacLocal.org

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Address: [redacted]

Email: [redacted]

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From: Claire Reutter

Address: [redacted]

Email [redacted]

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Claire Reutter

KeepMopacLocal.org

TO: Texas Dept. of Transportation, Austin District,
Attention: Stacey Benningfield,
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From: JAMES WICK

Address: [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Marco Antonio Orantia

Address [redacted]

Email: [redacted]

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Attention: Stacey Benningfield,
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From: Bonnie Isaac

Address [redacted]

Email: [redacted]

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TO: Texas Dept. of Transportation, Austin District,
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From: Abby Anna Batko-Taylor

Address [redacted]

Email: [redacted]

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This toll road is a negative addition to Austin in many ways. Far from easing traffic congestion, it will merely increase the number of cars on the road, in addition →

to long-term damage to environmental quality in Austin and Travis County.

Attachment I

Court Reporter Comment Transcript

OPEN HOUSE AND PUBLIC HEARING

CONDUCTED BY TEXAS DEPARTMENT OF TRANSPORTATION

FOR STATE HIGHWAY 45 SOUTHWEST

FROM MOPAC TO FARM-TO-MARKET 1626

TRAVIS AND HAYS COUNTIES

DATE: Tuesday, July 29, 2014

LOCATION: Bowie High School
4103 Slaughter Lane
Austin, Texas 78749

TIME: 5:00 p.m. to 8:54 p.m.

RE: Open House to discuss proposed State Highway 45 Southwest from Mopac to Farm-to-Market 1626 in Travis and Hays Counties and to obtain verbal and written comments from interested citizens.

Page 1 through 105

Reported by: Karen Geddes, CSR 5627

VERBAL COMMENTS

SUE SCHAFFER: I really feel bad for the people in Shady Hollow and I think they need a better way out of there, but unless they put an under or overpass by LaCrosse and Slaughter before they finish 45, traffic will be backed up at rush hour so far back that they're not going to save any time. They need to do the work on Slaughter and LaCrosse before they finish 45.

(Statement concluded at 5:10 p.m.)

MEREDITH MORSE: My name is Meredith Morse, and I am a legal intern with Environment Texas. We are a state-wide, non-profit advocacy group for clean air, clean water, and open spaces. We are based here in Austin, and we as well as our local members will be affected by this project. We thank you for striving to achieve your stated goal of an environmentally conscious project, and for hosting this public hearing so that you can incorporate the opinions of concerned citizens to achieve that goal.

Our chief concern about this project is the portion of the proposed highway that will cross over the Edwards Aquifer recharge zone. This recharge zone is fundamentally important to the aquifer, to Barton Springs and to associated drinking water wells. The

traffic and development from this proposed project will negatively impact the water system. Especially in light of the recurrent drought conditions in our region, we should not jeopardize the quality of our water in pursuit of addressing traffic congestion.

In light of these undesirable environmental impacts, we are disappointed that the Environmental Impact Statement does not adequately evaluate proposed alternatives to crossing through the Edwards Aquifer recharge zone. The draft quickly dismisses strategies for mitigating traffic without constructing an environmentally threatening highway, like expanding existing roadways or implementing innovative intersection design. These alternatives would be less costly to the environment and to the taxpayers.

Moreover, the draft fails to include at least three pending environmental studies, the results of which will be critical to evaluating the extent of potential environmental impacts of this project. Because the draft does not comprehensively address the range of possible environmental impacts of the project and because it fails to fully consider the reasonable alternatives, this draft is essentially incomplete.

We understand that this is an extensive proposal that requires significant time and effort to

cover. In appreciation of this, we implore the Texas Department of Transportation to rescind this draft so that critical environmental impact studies and proposed alternatives to this project can be given greater consideration.

A fundamental part of incorporating public feedback is giving the public sufficient time to review the direct environmental effects of the project. Despite the extensive nature of this project and the length of this draft, the public commentary period extends only for the minimum amount of time required by the law. We urge you to extend the public commentary period so that citizens for whom this project is designed may provide thoughtful feedback.

Thank you for giving me the opportunity to speak today.

(Statement concluded at 5:14 p.m.)

(Recess 5:15 p.m. to 6:00 p.m.)

PUBLIC HEARING BEGINS

CHRIS BISHOP: Ladies and gentlemen, if you would take your seats, we would like to get the public hearing tonight underway. Please take your seats.

Good evening, everyone. My name is Chris

Bishop. I'm the Public Information Officer at the Austin District for the Texas Department of Transportation. You probably know of us as "TxDOT."

It is Tuesday, July 29th. The official time is 6:00 p.m., and we're going to begin the public hearing for the proposed State Highway 45 Southwest project. The project limits are Loop One, commonly known as "Mopac," and FM 1626. I would like to note that this public hearing is for the SH 45SW project only and it does not address any other proposed projects in this area.

I'd also like to respectfully ask that you turn off or silence personal electronic devices for the remainder of the evening. I understand you have to stay in touch with family, but please put them on vibrate or stun or something like that so we don't disturb everybody else during the hearing.

Tonight Carlos Swonke from TxDOT will be serving as your official public hearing officer. On behalf of TxDOT, I would like to welcome you all to this hearing and thank you for your attendance and tell you that we actually look forward to receiving your comments. If you did not sign in when you entered the school and entered the room here tonight, please do so either during the break or at least before you leave.

We would like to have a record of everyone's attendance this evening.

Right now I'd also like to recognize some local government officials who are present here tonight, Mayor Todd Ruge from Buda, Mark Jones, Hays County Commissioner, Ellen Troxclair representing State Representative Jason Isaac, Laura Morrison from the City of Austin, welcome, Mr. Larry Oda, Bob Larson, Barton Springs/Edwards Aquifer District, and Chris Riley from the Austin City Council.

Did I miss any other elected officials? Those are the ones that have talked to us or signed in. If I did, please stand up and let us recognize you. We appreciate your taking time out of your schedule and being here as well.

We would also like to thank the Austin Independent School District and Bowie High School for allowing us to use this magnificent facility for tonight's hearing. I want to start by going over the format for tonight's public hearing.

The format of the hearing is in the agenda, it's in the information packet that you picked up at the table. If you didn't get a packet when you entered, they are back on the sign-in table, by all means go back and get one and of course sign in.

As you are aware, we began the program this evening with an open house at 5 o'clock and we're going to provide an overview of the hearing procedures before we move into the technical and the environmental presentations.

After those presentations, we will have about a fifteen-minute break. During the break, we want you to feel free to view the exhibits in the back in the open house area, visit with staff and all of the people back there with the name badges, they are available to answer questions and provide any last-minute information that you need.

After that break, the hearing is going to reconvene with the public comment hearing. Now, verbal comments are going to be limited to three minutes. They are going to be taken in the order that the speakers cards are received. Again, we appreciate you being here to review, discuss and provide input on the proposed State Highway 45SW project.

All right. Now we get formal. Okay. The purpose of this public hearing is to provide an update on the project, describe the alternative study, to address project needs, to present the Draft Environmental Impact Statement and the preferred alternative that resulted from those studies, and

receive public input on the process of the DEIS and the preferred alternative.

Now, this public hearing is being recorded by a Certified Court Reporter for a formal record who will be preparing a transcript of this hearing. We do want to hear from you, so please take the time to give us your input either by filling out a comment form or filling out the speaker cards so you can speak during the public comment portion after the first presentation.

In adhering to public hearing rules, we are not allowed to answer questions or respond to comments during the public comment session. However, as I said, the project team is in the back and they will be available during the break to answer questions for you one-on-one.

If you wish to present verbal comments, by all means, fill out a speaker card that are back at the sign-in table. You can leave the completed card back there with the staff and then I'll call all the speakers up in the order that they signed up. You can also provide verbal comments directly to the court reporter, right here, during the break or at any time after the comment period tonight before you have to leave.

At the back of your information pack, there is a written comment form. If you would like to

comment, you're a little shy and you don't want to do it verbally, you don't want to go and visit the court reporter, by all means, please submit your comments in writing. Written comments can be placed in the boxes located back at the comment table, sign-in table, they can also be mailed, faxed or e-mailed to the project team. All of that information on how to do it is in the handout packet that you get when you signed in.

All comments to be included in the public hearing comment record must be received by midnight, Wednesday, August 13th, Central Standard Time. Your comments are going to be reviewed and taken into consideration during future project development. Our response to those comments received will be provided in a public hearing summary and analysis report at a later date and will be posted on the project website WWW.SH45SW.COM.

All right. I'm now going to turn the presentation over to Doug Booher, who is going to discuss the environmental study.

DOUG BOOHER: So good evening. My name is Doug Booher. I'm the Deputy Director of the Environmental Affairs Division in TxDOT. I would like to welcome you to tonight's hearing.

Before we begin, I would like to briefly go

over a few safety issues. If in the event of a fire, we have emergency exits in the back of the room and there's emergency exits on either side up here. In the very unlikely event of inclement weather, a tornado or something of that nature, we will just shelter in here and move away from the windows.

Tonight's meeting is on the proposed State Highway 45 Southwest project, which as you can see from the map, extends from Loop One, or Mopac, in Southern Travis County, to FM 1626 in Northern Hays County.

I'll start off the evening with a brief presentation on the Draft Environmental Impact Statement, or DEIS. This will be followed by a presentation on engineering and design elements of the proposed project, and then we'll conclude with a brief presentation on the right-of-way and acquisition process. Further although identified in the DEIS, does not require any new right-of-way, but as a matter of course, we discuss the right-of-way acquisition process at hearings.

As Chris mentioned, following the presentation there will be a public comment period. Again, if you wish to speak, please fill out a speaker card at the back of the room and turn it in at the sign-in table. You can also make comments to the court

reporter outside the backdoors there or give written comments this evening in the boxes in the back of the room and outside.

After this evening's hearing, you can mail the comments to the address that's in your comment form or visit the project's website, and the web address is in the materials you received. Again, as Chris mentioned, we must receive your comments by August 13, 2014, to be included in the official record of this public hearing.

With that said, I will go into a brief overview of the Draft Environmental Impact Statement and some of its findings.

The proposed State Highway 45 Southwest project will be paid for with a combination of state and local funds. Since no federal money will be used, the Environment Impact Statement is being developed based on state law governing nonfederal projects as outlined in the Texas Administrative Code. The process of developing a state EIS is very similar to the process used to develop a federal EIS.

As you can see from the list on the screen, we evaluate numerous issues just like on a federal EIS, including the project's impacts on adjacent communities, water quality, noise and threatening endangered species,

to name a few.

The purpose of the proposed project as shown on this line is to improve system connectivity and local mobility, improve travel times, and provide an efficient alternate route to congested local roadways.

The need identifies the challenges that we're trying to address. Because of lack of efficient direct routes, drivers are currently having to use local roads like Brodie Lane, Manchaca Road, Slaughter Lane and William Cannon to reach Mopac in destinations north.

All of this is supported by traffic modeling prepared for the project, which I will now briefly discuss.

What the traffic modeling tells us, the model projects that traffic using the local street network, roads such as Brodie, Manchaca, Slaughter and William Cannon, will increase by 50 percent from the years 2013 to 2035.

To understand the photograph, the model calculates the number of vehicles crossing from south to north and north to south at the locations depicted by the blue dots on the map on the screen. In 2013, approximately 210,000 vehicles a day were crossing back and forth at those spots. By 2035, that number is projected to increase to 314,000 vehicles a day.

The model also shows what roadways those current 210,000 vehicles are using to get to their destinations. As you can see depicted on this figure by the large arrows, vehicles are currently using FM 1626, Brodie, Manchaca, Slaughter and William Cannon to reach Mopac and other destinations north. The reverse, of course, is true in the evening.

The model also allows us to determine what effect a new connection between two points might have on the roadway network. When we put a connection between Mopac and FM 1626 into the model, we see a 25 percent reduction in travel times during the morning and evening rush hours on local streets such as Brodie, Manchaca and Slaughter.

In order to address the needs identified, six possible courses of action were considered. We refer to these as "alternatives." The do-nothing or no-go alternative is always carried forward in the environmental process to assess the consequences of doing nothing and for a point of comparison to the other build alternatives.

Transportation System Management and Travel Demand Management alternatives were considered, but not carried forward because they would not meet the purpose and need of the proposed project.

Upgrade one or more existing roadways to a freeway was also considered. We looked at Brodie, Slaughter and Manchaca as possible options. This alternative was considered unreasonable because upgrade in any one of those roadways would result in numerous residential and commercial displacements and would directly impact City of Austin water quality protection lands. Because of this, it was dropped from further consideration.

A new tollway on a new location was also considered. This alternative consisted of construction of a new tollway on lands outside of the existing state-owned right-of-way, which I'll discuss shortly. This alternative was dropped from consideration because such construction would directly impact City of Austin water quality protection land and would require residential locations.

A new tollway on existing state-owned right-of-way was also considered. This alternative consists of construction of a new tollway on the existing stated-owned right-of-way. As most of you are aware, Travis and Hays Counties aren't the right-of-way for State Highway 45 and donated it to the state in 2003. As you can see, this alternative has been identified as the preferred alternative for the project.

The new tollway on existing state-owned right-of-way was selected as the preferred alternative based on the criteria listed here. Briefly, this alternative meets the purpose and need, would not directly impact City of Austin water quality protection lands, avoids relocations and displacements by staying within existing state-owned right-of-way, and is consistent with regional planning that has occurred over nearly three decades.

Now I'm going to briefly discuss some of the issues evaluated within the DEIS. With regard to land use, direct impacts would not be anticipated since the proposed project would remain within the existing state-owned right-of-way, which is shown in green on this map.

While induced growth could result as a result of the proposed project, the amount of land available for such development is constrained by several factors. Shown on the map in blue are City of Austin water quality protection lands. Much of this land parallels the state-owned right-of-way, as you can see, and these lands have been protected in perpetuity from development.

Further, there would be no access points to State Highway 45 Southwest from the intersection of

Mopac to Bliss Spillar Road. In other words, there would be no driveways or intersections for three miles of the roadway. For the remaining half mile from Bliss Spillar to FM 1626, limited access to the facility may be provided. The type of access would be determined based on engineering constraints, the plans of adjacent landowners and the requirements that provide access by state law.

Archeological investigations of the project area identified two archaeological sites. Coordination with the Texas Historic Commission resulted in a finding that one of the sites, the Ransom and Sarah Williams Farmstead, did warrant formal designation as a State Antiquities Landmark. TxDOT conducted extensive excavations at the farmstead site to mitigate potential project effects and the final report on this work is in progress.

With regard to socioeconomic resources, air quality, noise, and historic resources, no significant impacts are anticipated to result should the proposed project go forward.

Because this project is on the Edwards Aquifer Recharge Zone, a geological feature survey was conducted. This type of survey is required by the Texas Commission on Environmental Quality, or TCEQ, and seeks

to identify geological features that would allow water to recharge the aquifer. TxDOT conducted geologic feature surveys of the state-owned right-of-way in 2007 and in 2014. The survey allows project designers to avoid and minimize impacts to sensitive features. Based on the current design, four features would be directly impacted by the project. Minimizing impact of these features is still under discussion.

Recharge features not directly impacted will be capped or surrounded by a berm in accordance with the TCEQ requirements. A wetland survey that was conducted in the state-owned right-of-way determined that no wetlands are present, however, forest streams cross the right-of-way. The proposed roadway design includes provisions that span these streets, therefore the project would not require a permit under the Clean Water Act.

And finally, approximately 159 acres of vegetation within stated-owned right-of-way would be permanently and contemporarily impacted by the project. Re-vegetation would comply with TxDOT's vegetation management guidelines.

As previously mentioned, the project is over the Edwards Aquifer Recharge Zone and specifically over the portion or segment of aquifer that flows to

Barton Springs. As the aquifer and Barton Springs are home to two endangered species of salamanders, and in general salamanders are sensitive to water quality, I will briefly discuss the water quality contest of the project area.

Approximately 90 percent of the state-owned right-of-way is located over the recharge zone. For areas over the recharge zone, the TCEQ Edwards Aquifer Rules apply to the project.

The purpose of the Edwards Aquifer Rules is to protect existing and potential uses of groundwater and to maintain Texas Service Water Quality standards. These rules require that 80 percent of increase in total suspended solid be removed from the storm water runoff during construction and subsequent operation of a given project.

A recent analysis of the water quality at Barton Springs, based on City of Austin data, indicates that total suspended solid concentrations and sand are declining in the springwater which would suggest that Edwards Aquifer Rules are achieving the desired outcome. To comply with these rules, water quality protection measures will be incorporated into the design of the project, and Lucas will discuss these later.

For the State Highway 45 Southwest project,

the combination of water quality protection measures proposed will result in the removal of a minimum of 90 percent of the total suspended solids in storm water runoff over the recharge zone. This is above and beyond the required 8 percent by TCEQ.

As mentioned earlier, geologic feature surveys were conducted of the state-owned right-of-way. However, the opening to Flint Ridge Cave is approximately 175 feet outside the state-owned right-of-way. As this is an environmentally sensitive cave, special measures have been incorporated into the design to protect it, and again, Lucas will discuss the measures in detail.

We evaluated the project's potential to impact federally listed threatened and endangered species. Three species are of particular concern in context with the State Highway 45 Southwest project. They are the Austin Blind and Barton Springs Salamander and the Golden-Cheeked Warbler. There are no springs in the project area that are known to contain other species of salamander. The Barton Springs Salamander is known to occur in a spring approximately two miles west of the state-owned right-of-way. However, as discussed, water quality protection measures would maintain the water quality above the TCEQ Edwards Aquifer Rule standards

and the project design would maintain the water quantity reaching Flint Ridge Cave. Therefore, based on the water quality protection measures and the avoidance of minimization measures incorporated into the project design, no harm to either salamander species is anticipated to result from construction and operation of the proposed project.

The Golden Cheeked Warbler is known to occur intermittently in the project area. Surveys for this species were conducted in the state-owned right-of-way in 2014 and no Golden-Cheeked Warblers were encountered. In addition, an assessment of the vegetation present in the state-owed right-of-way was conducted to determine the suitability as potential habitat for the Golden-Cheeked Warbler. Although the vegetation makeup is similar to Warbler habitat in some areas the height and age of the trees are different from that found where Warblers typically occur.

We also reviewed the results of past surveys conducted by TxDOT in the right-of-way and others on adjacent lands to determine the potential for Warblers to occur adjacent to the state-owned right-of-way. Based on surveys conducted by TxDOT and others, the assessment of vegetation present, we conclude that no suitable Warbler habitat is present in

the state-owned right-of-way and that areas intermittently occupied by the Warbler in the vicinity would be unaffected. Therefore no harm to the Golden-Cheeked Warbler is anticipated to result from construction and operation of the proposed project.

I'm going to turn it over to Lucas Short and he's going to talk about some of those water quality protection measures and what we have done specifically for Flint Ridge Cave.

LUCAS SHORT: Good evening. As Doug said, I'm Lucas Short with TxDOT's Austin District. I'm the project engineer for the 45 Southwest project and I'll be giving the technical presentation for the roadway schematic being considered here tonight.

First we're going to start with the typical sections, and 45 Southwest is proposed to be a four-lane divided section for the entire length of the project. The length configuration from 1626 to Bear Creek will be a four-lane divided facility, as you see here on the screen. There will be two twelve-foot lanes in each direction, a ten-foot outside shoulder, a four-foot inside shoulder, and the roadways will be separated by a sixty-foot grassy median.

There will be a ten-foot shared-use path on the west side of the road for the entire length of the

project. As discussed in the environmental presentation, there are certain water quality protection measures required for projects inside the recharge zone. The first of these will be the asphalt layer, a porous friction course, or PFC. Other measures include side slopes for use of vegetation filter strips, and the ditches, which are known as grassy swales.

For the majority of the project, the grassy swales will drain into water quality features. Each of these water quality features will remove additional total suspended solids from the water. When used in combination, these measures will remove over 90 percent from the project, as Doug stated.

The next typical section you see is a four-lane divided by a barrier. There will still be two twelve-foot lanes in each direction with ten-foot outside shoulders, but now the roadway has been narrowed together, a barrier placed in the center will have pipe controls. The reason for this typical section, as we'll see later on in the slide, is allowed us to move the roadway around sensitive karst features.

The water quality protection measure that I just discussed with the other typical section will be in here, the PFC vegetative filter strip, grassy swales and the water quality ponds. The concrete traffic barrier

is put in place for safety.

Now, we'll look at the project as a whole for the planning. As previously stated, the project being considered is completely within state-owned right-of-way. The shared-used path is the orange line you see on the schematic here. We'll try to point to the maps. You can see from Bliss Spillar to 1626, it is on both sides of the road to allow for bicycle and pedestrian access to both the north and south side of the intersection on 1626.

From Bliss Spillar to Escarpment Boulevard, the shared-used path will continue on the west side of the road. The alignment of the shared-use path moves around so to avoid features, karst features, in certain locations, and in certain locations it's raised to be used as a berm to divert the offsite water from the roadway runoff which was a best management practice that was developed in coordination with our partners on the project.

Now, the roadway section, as I mentioned, is two twelve-foot lanes in each direction, the four-lane divided section with the grassy median until Bear Creek. From -- a bridge will span Bear Creek and the roadway comes together -- you can't see it on here, but it will in a second -- the roadway was shifted over

to Flint Ridge Cave.

As discussed in this presentation, due to water quality protection plans in the bridge itself that now have access, there will be no access points between Bliss Spillar and Mopac. Between 1626 and Bliss Spillar, access may be graded in the future, if this area is ever developed.

Now, let's focus in on each of the intersections. The intersection of 1626 and 45 Southwest will be what is called a Single Point Urban Intersection, or a "SPUI." This innovative intersection will allow for more efficient movement of traffic during the peak periods. To accommodate this intersection a portion of FM 1626 that is currently under construction will need to be reconstructed. The current configuration of 1626 being constructed is two lanes in each direction with a center turn lane. FM 1626 will continue to be two lanes in each direction, but in this case it will be separated by a grassy median and this is to allow for the additional lanes in the intersection. As you can see, 1626 in the northbound direction will be shifted eastward to allow for two twelve-foot left turn lanes going onto FM 45 Southwest.

The southbound lanes of 1626, this direction, will intersect with the left turn movement

from 1626 and also off of 45 at a single stop signal and the southbound lanes will then merge with two right turn lanes coming off of 45 Southwest.

At Bliss Spillar Road, this will be a grade separated or an overpass. There will be access ramps coming from the eastbound direction to accommodate Bliss Spillar and then there will be an entrance ramp in the westbound direction at Bliss Spillar Road.

The intersection of 45 Southwest and Mopac will also be a grade-separated intersection. The traffic movement on the existing roadway and 45 intersection will stay the same. These lanes moving -- head southbound on Mopac wanting to go westbound on 45, the two lanes will stay there. The two lanes headed eastbound on 45 heading to the north on Mopac will be the same. Two lanes headed southbound on Mopac wanting to go eastbound on 45 will loop around the jug handle here and then go over the existing Mopac.

In order to get onto 45 from the existing 45, there will be a one-lane entrance ramp and then to head in the westbound direction there will also be a one-lane entrance ramp merging with the existing roadway. To head northbound on Mopac, there will be a one-lane ramp design.

As I mentioned earlier, water quality is a

large aspect of this project and the majority of the projects will drain to water quality ponds. As you can see on the slide, there are eleven water quality ponds. Each of these ponds will contain a hazardous material trap. There is a pond at the intersection with FM 1626, there is a pond under the bridge at Bliss Spillar Road, there are two ponds proposed between Bliss Spillar and Bear Creek, and there are two ponds proposed, one on either side of Bear Creek.

To capture the roadway runoff, including the runoff from the bridge, there are four ponds proposed between Bear Creek and Mopac. Again, these ponds are designed to capture roadway runoff and slowly release the treated water. There is a pond proposed at the intersection with Mopac to capture and treat the roadway runoff, including the bridge over Mopac. Along with the proposed pond at Mopac, there are six existing ponds that are already treating the existing roadway.

As Doug mentioned in his presentation, the most significant recharge feature out here is Flint Ridge Cave. The design team took this into great consideration as we were working on the projects. The proposed 45 roadway intersects part of the Flint Ridge Cave surface catchment basin, which is outlined in the blue. In order to protect the water quality of service

recharge from entering the cave, an approximately 2,900-foot-long berm, or the yellow line, is proposed adjacent to the right-of-way to keep the roadway runoff from the entrance to the cave. The berm would capture the roadway runoff and take it to the pond that is just north of Bear Creek. No roadway runoff would flow into Flint Ridge Cave.

In order to preserve the quantity of water recharging the Flint Ridge Cave, the proposed design would use the shared-use path on a raised berm and a drainage pipe to take off-site area approximately 5.6 acres through the culvert into the drainage basin of Flint Ridge Cave.

Now, we didn't only consider the proposed projects once construction is complete. We also looked at what to do during construction. Construction of the proposed projects would be phased in order to reduce the amount of disturbed area at any given time, to reduce the amount of potential pollution or sediments reaching the aquifer during construction. Proper temporary erosion devices such as rock filter dams, silt fences would be installed, inspected by the onsite environmental compliance manager and maintained throughout construction.

The ponds that we just previously looked

at, would be built as soon as possible during construction. It's one of the first things that we were looking at building in order to use them for the construction phase and then they would be turned around and used in the permanent situation as well.

In addition to these being pieced, there will be additional best management practices around sensitive features, as you can see on the list here. We'll leave the vegetation as much as possible in its natural state. We would minimize the construction inside the buffer. And if you've had a chance to look at the schematics in the back, there are a few places where we've introduced retaining walls next to features so that we will not fill over the top there. That construction may occur inside the 50-foot buffer around the feature, but as a whole it protects the feature.

There will be no pesticides or fertilizer used. Temporary runoff will be protected as I've just shown here, no drainage outfall in the aquifer, fenced with orange construction fencing, storage and maintenance of vehicles will be prohibited on the project in the buffer zone maintenance plan.

If there are any questions regarding the technical presentation, I will be available during the break. I will now turn it over to Chris.

CHRIS BISHOP: Thank you, Doug and Lucas.

As previously stated, there's no additional right-of-way expected for this project. Therefore, no residential or business displacements are anticipated. However, should it be determined that right-of-way acquisitions will be needed, they would be done in accordance with the standards established by applicable federal and state statutes and guidelines.

If any needed right-of-way is not donated, appraisals would have to be secured on the property to determine just compensation in accordance with applicable guidelines. The determination of value would be offered to each property owner, the value would include the value of the area to be acquired, real property improvements located within the area to be acquired, and any damages to remaining property. Each property owner would be afforded the opportunity to accompany the appraiser during inspection of the property. In all cases, property owners would be reimbursed for any reasonable incidental expenses necessarily incurred in transferring title to the state.

We do have available booklets entitled "State To Purchase of Right-of-Way" and "Relocation Assistance." Those booklets do provide a general overview of the acquisition process and a relocation

assistance program. If you have an interest or feel that you might be affected by this proposed project, or for that matter any other, please take one of those brochures before leaving tonight.

If you have any questions regarding these matters, also please feel free to speak with one of our TxDOT representatives during the break and we will be happy to provide you with additional information and more details.

I do want to take a moment to acknowledge a couple more elected officials who have made it in for this evening, Craig Smith and Mary Stone, both with the Barton Srings/Edwards Aquifer District. We are glad that you are with us this evening.

I also want to go ahead and tell you we've had a note from some folks about the air conditioning. The school has turned it down as low as it can go, so stay cool.

All right. As I said earlier, the main purpose of this hearing is to hear from you and provide an opportunity for you to comment on the project including what you've seen and heard tonight. All comments received, whether written or verbal, will be included in the official public hearing record, and once again, if you wish to make verbal comments during our

formal public comment period, please feel out a speaker registration card. Some of them are on your seats, the rest of them are back at the sign-in table, turn the cards in there and we will put you in the computer.

Also I've heard from some people because of the lighting you may not have been able to see the slides clearly. Most of that information is available on some of the tables in the back in one form or another. Please feel free to crowd around there if you need to look at something to get clarification.

We are going to take about a fifteen-minute break to give you an opportunity to ask questions and do some research in the back. Again, the project team is wearing name tags and are stationed around the back of the room at the exhibits.

After that, we get into the real public hearing part of the evening. So a fifteen-minute break. We will reconvene, targeting right now, at 6:53.

(Recess 6:37 p.m. to 7:00 p.m.)

STATEMENT TO COURT REPORTER

DURING RECESS BY JOE LABRIOLA

JOE LABRIOLA: There was an inability to maintain the scheduled break so that the myriad number of people here were kept longer than necessary. The fifteen-minute break was extended by seven minutes and

counting.

(Recess 7:00 p.m. to 7:03 p.m.)

CHRIS BISHOP: Ladies and gentlemen, as the saying goes, calm down. If everyone can please have a seat, we are going to begin the public-comment portion of our hearing tonight.

It is 7:03 p.m. and we are going to reconvene. One point that I would like to make is that nothing that has been presented here tonight is final, it is all subject to change based on the written and verbal comments that we receive.

I also want to remind you during the verbal comment period we will not be able to answer questions. We've had time now set aside for you to ask questions. We will still have staff in the back. If you wish to present a verbal comment tonight but have not turned in a speaker card just yet, the sign-in table has those at the back.

I would like to take a moment and recognize Sheryl Cole, Mayor Pro Tem, City of Austin, has joined us this evening and we appreciate her being here as well.

Okay. Here's the way this is going to work: I am going to call out the names of people who have signed up to speak so their comments can be

included in the record. I am going to call those names just like there's an ark, two-by-two. So we'll put one person in the microphone and another one in the chair, and as each speaker finishes, I'm going to call the next one or two. We have two chairs over here so that we can keep things flowing and let everybody get home at a reasonable hour.

In order to assure that everybody who wants to make a formal comment this evening has an opportunity to do so, a reminder, we will limit comments to three minutes, and sharing of the minutes is not allowed. Here is the way it works. We want you to use the microphone, be sure to face our court reporter when you're speaking so that she can make sure your comments are recorded accurately.

We are going to take the speakers in the order they signed up. Some of the elected officials have asked if they can kind of move up the food chain a little bit because they have other engagements to get to, so we will handle that.

If you would like to give a verbal comment, but you have a little stage fright, I understand. Through the doors in the back immediately to the left is another court reporter, so during the comment session if you would prefer, you may go back there.

Okay. Our first speaker is going to be Mayor Todd Ruge from Buda and followed by County Commissioner Mark Jones, if you'll come forward, and the third one will be Ellicot Square from State Representative Jason Isaac's office.

MAYOR TODD RUGE: Good evening. For the record, my name is Todd Ruge and I live at 302 North Cedar Street, Buda, Texas, and I am the Mayor of Buda, Texas.

You know, this is a project that we have been talking about for twenty-plus years and I want to start by thanking all of those that have been involved in this long hard arduous battle to get us to this point. As elected officials, a lot of times we have to do things that may seem unpopular at the time, but we have to do them for the greater good of all.

I want to give a quick background. There was a slide earlier about the growth that's going to happen in Hays County, that's absolutely correct. When my wife and I moved from Austin down to Buda in 2005, there was 4,000 people, the census in 2010 showed 7,000 people, today we are pushing 13,000 people, and there are projections in the next 20 to 25 years that there's going to be 70,000 people in Buda. And that is not to say anything about Kyle or San Marcos who are also

growing very rapidly.

This, as it's been planned, is an environmentally sound road. I know there's many of us here that don't believe that we should do this. I think every action has been taken to make this a very sound road.

As this road moves forward, and there will be arguments about this, but this is something -- and one of the arguments is, this is benefiting Hays County, and yes, it is going to benefit Hays County tremendously, but I would also like to remind everyone that we just opened an ACC Hays County right off of 1626, so this is going to be a two-way -- three-way road for people from Travis County to use as well.

Again, I would like to thank everyone involved that has brought us to this point and I think this road should be done sooner than later.

Thank you.

(Audience clapping.)

MARK JONES: Mark Jones. I'm the County Commissioner of Precinct Two, which covers the part that's going to be built in Hays County. I just want to restate I've made this position clear many times that we need this road to be built and it should have been built a long time ago. I think it's a shame that it takes

26 years to build a road that the majority of the people that live in that area have wanted for so long.

I also have resolutions coming from six cities in my precinct. All six cities in Precinct Two are getting resolutions in support of building 45. So I also want to assure that when Commissioner Daugherty and I started this project, our charge to the committee was that this road would be built environmentally sound. When we started this project, we looked at doing it as a county road and knew that we could not build it environmentally sound as a county road and to get the amount of dollars that it's going to take to build this road, that it needed to done as a toll road.

This will be the most environmentally sound road in the state, so I would just encourage us to get going and get it built.

(Audience clapping.)

ELLEN TROXCLAIR: Hi. My name is Ellen Troxclair and I am a city council candidate for District Eight in Southwest Austin, but I'm here serving in my capacity as chief of staff for State Representative Jason Isaac. Representative Isaac represents Hays and Blanco Counties and he's absolutely supportive of this road being built. It's critical that his constituents in his county have access to Southwest Austin and it's

also important that in order to keep up with the growth of the Austin and Hays County Metroplex that we increase our road capacity and dedicate the resources that we have already set aside to building these roads.

Of course, it is important that we take into consideration environmental concerns, but I think every precaution is being taken to make sure that the environmental impact is minimized as much as possible.

So again, my name is Ellen Troxclair here on behalf of State Representative Jason Isaac and I just wanted to insist support for the building of SH 45.

Thank you.

(Audience clapping.)

LAURA MORRISON: Thank you. I am Council Member Laura Morrison with the Austin City Council and I thank everybody for having us and listening to us tonight.

I want to begin by briefly mentioning a point that our staff will be providing many detailed comments about tonight, and you will probably be hearing some more tonight, and that is, that the environmental impact of SH 45 really cannot be assessed adequately when there's missing critical scientific information.

So the EIS is premature without the currently underway City of Austin Drip study of the

Flint Ridge Cave subsurface drainage basin and the survey of karst features that's currently underway.

It's imperative that the environmental impacts be based on valid scientific and engineering data, and I agree with our city manager who recently wrote a letter to TxDOT urging TxDOT to withdraw and then reissue based on adequate science.

But I'm not a scientist, I'm a policy-maker, so I want to address and focus on three policy issues that I think arise with the Draft EIS. First that SH 45 is one of four projects currently under consideration that affect a single sensitive environmental resource, the recharge zone, and as such, we need to be able to look at the impact comprehensively. The feds made it very clear that piecemeal evaluations are not adequate.

Next, under our Balcones Canyonlands Conservation Program, we hold a joint permit with the county under the Endangered Species Act that protects, among other things, the critters in Flint Ridge Cave. And so it's imperative, and in fact, CTRMA's contract with the county requires that the project not violate the permit. So protection of those critters will need to be done and the importance of this cannot be overstated because the permit is integral to the

economic development and health of our region. A violation and then a need to amend the permit would be a huge taxpayer expense and stall the economic prosperity that we have.

And then lastly, I want to mention that the Draft EIS erroneously states that SH 45 Southwest is not in conflict with the City of Austin's comprehensive plan. It is in conflict with it. We explicitly took SH 45 out and had further actions regarding that.

So I would respectfully suggest that TxDOT and CTRMA have an obligation to disclose that conflict, to look for a way to avoid the conflict, minimize the conflict, raise it as a last resort, mitigate the conflict, and I believe the draft fails on all four counts.

So for both technical and policy reasons, I would urge you to withdraw the draft and reissue it after dealing with the policy issues and getting back adequate science.

Thank you very much. I appreciate it, everyone.

(Audience clapping.)

BRIAN SMITH: My name is Brian Smith. I'm with the Barton Springs/Edwards Aquifer Conservation District, and the role of the District in this project

is unique because there's a court-issued consent decree between the district and TxDOT that was signed in 1990. The consent decree guides our participation with its project and our review of the Draft Environmental Impact Statement.

The objective of this consent decree is to ensure that the highway is constructed in an environmentally sensitive prudent fashion and the consent decree further states that the terms of the judgement are designed to protect the aquifer from potential effects of highway construction and subsequent use and consistent with public interest.

However, the Draft Environmental Impact Statement does not mention the consent decree at all, nor does it mention how the construction operations Southwest -- 45 Southwest will be done in accordance with the consent decree. And the Draft EIS acknowledges the sensitivity of the karst setting and the underlying Edwards Aquifer, and the document states that impacts would be negligible from the construction and operation of the highway, but sufficient data aren't provided in the Draft EIS. We have to accept that statement at face value.

The Draft EIS also states that robust BMPs will be constructed, but which specific BMPs would be

used for which specific karst features is not presented in the document. The actual alignment in the highway relative to significant karst features needs to be presented before, we, the District, can make an evaluation of the effectiveness of any of the BMPs.

The Draft EIS states that information from the ongoing geologic assessment will be reported in the final EIS and that a WPAP will be prepared for approval by TCEQ, but there's no mention of other opportunities for public comment in this process.

An additional comment period is needed once the design is completed to be able to assess sustainability of the highway design in conjunction with the geologic assessment in the WPAP. And further details of these thoughts will be presented on our written comments.

Thank you.

(Audience clapping.)

CLAY HUCKABY: Good evening. My name is Clay Huckaby. I'm the Fire Chief of Buda Fire Department and Buda EMS. On behalf of the Commissioners of Hays County Emergency Service District Number Eight and Hays County Emergency Service District Number Two, both commissioners, or board commissioners, have passed resolutions supporting State Highway 45. We would like

to see this road built to add a little bit of help to our response times to local area hospitals to provide EMS service.

Currently we are having to use Interstate 35 as our only local route to Austin or Manchaca Road, Brodie Lane or South First. During the high-peak traffic times on Interstate 35 sometimes our response times are extremely high trying to reach Brackenridge, South Austin Hospital or Seton Main off 38th Street.

So with the road being built, it will allow us quicker access and easier access to provide patient care and mobility to hospitals in the City of Austin. We do have a hospital in Kyle that we do transport patients to, but that hospital is not capable of some of the higher technology and medical advances that we see at the Austin area hospitals, so we do transport a lot of patients to Austin hospitals.

As well, in the event of wild land fires, structure fires or natural disasters, you rely on your fellow neighbors, your area departments, your mutual aid departments. So a lot of times we have Travis County fire departments come down into Hays County to help us, vice versa, Buda can respond up to Oak Hill, Austin, Manchaca, and be able to help these other departments in

their time of needs and they would be able to help us down in Hays County.

So we support this road making it easier for fire and EMS and mobility for us to get our patients down into Austin. Thank you.

(Audience clapping.)

MIGUEL MORRIS: Good evening. My name is Miguel Morris. I live at 3700 Shady Valley Drive. This is the third home that I have purchased in Austin and paid for, and I want to, first of all, say three things.

Number one, I want to thank Commissioner Daugherty for his support in keeping his pledge to help us with this project and all the other people that have worked so hard and I'm very impressed with your input, it's very technical and seems very thorough, I'm sure you're having to take care of all the things that were mentioned that need to be added.

Number two, for those of you that are wavering, don't know which way to go, I plead that you support this project, get with it, get with the team. We need it. It's got a safety issue to it, and I ask you to do it.

Number three, for those of you that are adamantly opposed to this project, I say reconsider, reevaluate, take a look at the data and see if you

remember why you were elected to these various offices, and I say I can boil that down to one idea, and that is to help people get things done and we need your support.

Short and sweet, and thank you.

(Audience clapping.)

LAUREEN CHERNOW: Hi. My name is Laureen Chernow. I'm a resident of the Shady Hollow subdivision off of Brodie Lane and a member of their board of directors.

My concern is that -- and that of many of my neighbors remains the same as it has for decades. Traffic on Brodie Lane, which by the way, is a very local road, I know you hear that Mopac is a local road, I don't think it's nearly as local as the road that goes through my neighborhood.

Brodie Lane goes through many neighborhoods and navigating back, it's dangerous for our children and difficult for us to get back and forth on. Despite what some have suggested, and some of the people in this room, that we all simply move closer to where we work or have our jobs move to us, that simply won't work for everybody, and so I don't think that that really is a viable opportunity.

Also important, and something that nobody seems to be talking about is that there are a number of

major karst features all along Brodie Lane. The City of Austin has allowed neighborhoods to develop along Brodie Lane, there are no safeguards on Brodie Lane for those karst features. They are fenced off, there's nothing else. Traffic sits there, runoff occurs. I don't know why no one is talking about those karst features, but they should be.

I have also heard, well, widen Brodie Lane. That sounds great, except there is no right-of-way available on my section of Brodie Lane. It's in the county. Environmental consultants who have suggested that, well, then, tunnel under Brodie Lane and make a four-lane highway, sounds great, but I still don't think that's going to help our karst features any, so we sort of discount that idea in our neighborhood.

I realize that what you're talking about is a Draft EIS and that there's more information to come, what I've read of it, it seems to be a good start, there seems to be ways to build Southwest 45 without damaging the karst features along it, and I say that we have waited long enough to get that road built. Please start building it.

Thank you.

(Audience clapping.)

MARCUS WHITFIELD: My name is Marcus

Whitfield. I've been here in Austin since 1984. Most of my feelings have already been echoed by prior speakers. I just want to reiterate that the time to do this is now and we've been waiting for 30 years. There are karst features all over Austin and they're below homes, below buildings, they have been run into a thousand times.

This is being overly sensitized and I hope that we can get past this and move on with building the road. Thank you for your time, thank you for all the thousands of man hours that have gone into getting us to where we are today.

(Audience clapping.)

MARION MLOTOK: My name is Marion Mlotok and I would just like to address a couple of things that were brought up in the presentation. I think I saw that the modeling that was done reduced the times to be in traffic on Brodie, Manchaca, and Slaughter from like about 25 percent, but there was no mention of how much the times to travel would increase on Mopac once this road gets built, assuming it gets built.

As far as I can tell, we're not going to really alleviate any of the problems by building this road, and to build a road that is being called environmentally sound over sensitive aquifer is kind of

ridiculous, as far as I'm concerned. The aquifer is going to suffer no matter how, quote/unquote, environmentally sound the engineers say the road is going to be, because there's always going to be flooding in Central Texas, there's going to be droughts, there's going to be things that crack as a result of the heat, there's going to be runoff in the construction and later on in the road.

My biggest concern probably at this point in Central Texas is that we're running out of water in our drought, and the Edwards Aquifer is a source of drinking water and may become a source of drinking water we need to depend on even more in the near future or in the far future, and I would like to see our aquifer protected by not having this road.

I have seen modeling that showed that improving the timing on the intersections on, say, Brodie and Slaughter, as an example, would greatly improve the amount of time for traffic to pass, and I have seen modeling that would also improve the time for traffic to pass with improved intersection design, so I'm not quite sure why TxDOT just rejected that out of hand.

In conclusion, I would like to say that this road shouldn't be built. I would like to thank all

the people who worked so hard for keeping this road from being built for all this time.

Thank you.

(Audience clapping.)

BOB DIEDERICH: Good evening. My name is Bob Diederich. I live in South Austin. I'm the -- one slide that was up showing the intersection of 1626 with 45, that interchange, I'm not a traffic consultant or anything, but when I looked at it, I said that is an Oak Hill "Y" just waiting to be constructed, because you've got three lanes of traffic doing this (indicating), and once the traffic flow builds, you're going to have the gridlock like you have at that Oak Hill "Y."

So why not just put in flyovers? I understand there are people who don't like flyovers; they're ugly, they are not artistically creative or who knows, whatever, a bird might run into it and die, I understand all of that. But on the other hand, do it now so that you don't create the traffic problem five years, ten years, fifteen or twenty years down the road, that we're now trying to deal with at the "Y." All right.

Secondly, the traffic numbers that were used, I'm sure that they were thought out well, and

great time and effort put into them, but, you know, I talked to a number of people who have lived here longer than me, and I've lived here since 2000, and they've lived here since '90 and on, and I said: Hasn't traffic exploded here? I mean, hasn't it just exponentially exploded?

So to say that there's going to be 315,000 cars on the road, yeah, well, that might happen in five years, not in like 25 years. So again, you know, let's think in terms of the reality of what's happening with the growth of this area. We have gone from a midsized metropolitan area to a major metropolitan area on the census, and we are the third worst traffic congestion in America, third worst. That's the U.S. Department of Transportation's numbers.

And one more thing, I've got an idea, how about synchronizing traffic lights. How about getting it so that when I drive from my home on South Manchaca, take a right turn on Slaughter to go to 35 on a Sunday morning, it doesn't take me fifteen minutes because lights are going off where there's no traffic. How about fixing that? We are a Silicon Valley baby, but we have plenty of technological people who can figure that out. How about we figure it out. That, in and of itself, will be a short-term improvement.

Thank you.

(Audience clapping.)

BECKY BRAY: Good evening and thank you for allowing us the opportunity to visit with you all tonight. I am here in a capacity as both a transportation engineer and a resident of Southwest Austin. I have lived in Austin for over 40 years and in my 40 years I have witnessed a continual debate over 45 Southwest. The time is to build it and the time is to build it now.

I'll make my statement pretty short and sweet, but I wanted to say a special thank you to CTRMA, TxDOT, Travis and Hays Counties for continuing this fight, and most importantly, I wanted to say thank you to both Commissioner Jones and Commissioner Daugherty, because without them, we would not be where we are today.

We have got to remove the traffic from Brodie Lane. Brodie is at a choke point. There's too many children, there's too many buses, there's too many cars and vehicles. We have got to provide an alternative route for people coming from the south.

I have been a transportation engineer for over twenty years. I know, I know deep down, this road can be built environmentally sound and sustainable.

So thank you for your time this evening and I appreciate it.

(Audience clapping.)

NANCY MCDONALD: Thank you. I'm Nancy McDonald. I'm the Regional Outreach Director at the Real Estate Council of Austin. I represent 1,700 members of our organization and we all support State Highway 45 Southwest for a couple of reasons.

It eases congestion. I mean, any time there is an incomplete roadway, it contributes to regional congestion, not just people trying to get on Mopac but the ripple effect all the way to 360.

I want to make a few points. In 1997, the Travis County voters approved $3.3 million in bonds, road bonds, to purchase right-of-way for State Highway 45, and this is a separate bond ballot item to ensure the voters knew they were voting for State Highway 45 Southwest, and it won 59.7 percent to 40.3 percent. Travis County voters approved this in 1997, and what they did say about the right-of-way and they eased it over to TxDOT, so I don't want to talk about today that TxDOT has, trust how you guys did it back then.

And then let's talk about the City of Austin has done some good things. Again the voter

approved bond money. We bought 26,448 acres of land over the Edwards Aquifer, about a little shy of 2,000 acres in this particular setting that we're talking about now. So the city voters approved bonds to preserve land either buying it outright or for preservation of easements so that there would not be development. You've done a good job, Austin, you've done a good job, citizens of Austin, there is not going to be any development around this road, now we've done enough, it's time to build the road.

And I would like to finally say two things quickly in response to the city's -- all these issues are so long. Let's see.

When in 2011, the Imagine Austin plan, we had an Advisory Task Force for the city's watershed protection program, did a study, and on page five of that study -- I'm sorry -- it was August 8, 2011, they reported to the Task Force that it is technically feasible to avoid, minimize and mitigate impacts in a manner consistent with the goal of non-degradation. So I can go find that, you know, they are somewhere. They at one point save Austin a lot of safety. They are city staff.

And lastly, respectfully to Council Member Morrison's point about Imagine Austin plan having this

road in it, that's true and it's somewhat -- at least it's supposed to be back then, we are a member of a Regional Transportation Planning Board called CAMPO, which has multiple jurisdictions, all of whom have a say, so they operate under what's called a joint proposed agreement, and it's so that nobody goes rogue, not one city or county in this CAMPO region. And that one of the JPA, one of the Joint Power Agreements says no jurisdiction can have a comprehensive land that excludes a regionally significant roadway that is in the travel plan. We told them at the time when they wanted to include it and they had Imagine Austin.

Thanks very much.

(Audience clapping.)

ROY WALEY: Howdy, y'all. My name is Roy Waley. I am the conservation chair for the Austin Regional Group, the Sierra Club, and we are a member of the Keep Mopac Local Coalition.

I keep hearing that we have talked about this road for decades. That's right, we've talked about it. We haven't planned it and it's time to start planning it now, and it needs to be a part of a comprehensive plan because it's not a road that just takes place in this one section. It is a part of a road system and the greatest impact will be on Mopac.

Now, then, I have a lot of sympathy personally for the neighbors in Shady Hollow, and the Sierra Club does also, but there are solutions and they don't include 100 million dollars to put a road over the top of 300 to 350 environmentally sensitive recharge features just in the course of the roadway. They say it can be built environmentally safe.

Well, they talk about the berm to keep the water away from the entrance to the Flint Ridge Cave, but nobody knows the actual footprint of Flint Ridge Cave, and so the other environmental features that aren't paved over will be recharging to this. From there, it's a three-day trip for that water to Barton Springs. It's a three-day trip for that water and the pollutants that go with it to Barton Springs where all of Austin has spent hundreds of millions of dollars working to protect this unique environmental feature right in the heart of our city.

We talk about how we want to keep Austin special, this is one of the things that keeps Austin special. Another road does not make Austin special.

Again, I would want us to step back and see that this is not a road that has been promised. The road that was promised in the early '80s and late '70s, was the outer loop that went all the way out to 620, and

that is off the table now. So this loop will now make Mopac, I-35 West, and it will eventually allow 30,000 cars a day onto a road that is almost intolerable now.

So rather than to move ahead quickly with this, let's step back and plan the whole roadway, not just this portion of it, but every part of it, including how we get this traffic across Lady Bird Lake, how it impacts the other neighborhoods.

And I thank you very much for your time this evening.

(Audience clapping.)

JULIE MYHRE: Hello and thank you for allowing us to speak. My name is Julie Myhre and I'm a resident of the Shady Hollow Estates. This project is literally right in our backyards and yet our neighborhood has no direct benefit and only indirect benefit of this project because of the less traffic on Brodie Lane.

Although there are no environmental justice issues or environmental legal recourse we can take, I'd like to take this opportunity to suggest a few mitigation measures that can offset the direct effects of having to live with this holey in our backyards.

I have a lot of experience with this, probably as much as the people that wrote this EIS. I

am a licensed civil engineer and I have recently done two environmental assessments in Hawaii on highway expansion projects, and to that end, I know what I'm talking about.

This EIS seems like it's a pretty good document. I feel like it's addressed most of the issues or it will in the final. However, I would like to point out three things.

Number one, safety. There's a huge deer population in our neighborhood and they're tame, and this right-of-way is going to create browsing habitat at the edge of the highway where the forest begins or the trees begin that's going to provide habitat for deer and the DOT needs to accommodate the deer-car impasse which there will be. There has been four in our neighborhood just with me.

And also if I was going to be walking down that right-of-way where the people -- the lanes are, I would want some sort of a barrier so I wouldn't get run over by the 70-mile-an-hour traffic on that road.

Secondly, the economic impacts need to be addressed. On Shady Hollow Village shopping area, if there is less traffic on Brodie and Slaughter, there's going to be an impact to those businesses.

Third, multimodal transportation. I would

like DOT to look at putting in a park-and-ride at 1626. Our neighborhood does not have any access to buses. The only park-and-ride is at the "Y" from our neighborhood, and for us to get to downtown, you don't have any options.

The tollway should be free to the HOV. That is, if you have more than two or three people in your car, it should be free.

Generally I think that this project can be done correctly and I think this project is going to support the City of Austin economically, and so therefore, that's it.

Thanks.

(Audience clapping.)

BILL BUNCH: Good evening. Bill Bunch, I'm Executive Director of the Save Our Springs Alliance. We're part of the Keep Mopac local Dot Org coalition that has been working to oppose 45 Southwest and it's development as a link from South Mopac over to I-35. We will be filing detailed comments on a 1,000 page EIS, but we already filed a letter asking along with the City of Austin that the Draft EIS be withdrawn as woefully incomplete and premature.

TxDOT regs are very clear, they follow common sense, and that is, you publish your draft

Environmental Impact Statement after you have done the environmental studies, not before, so that the public can actually comment on the relevant information. That is what this process is supposed to be about. But it's very clear the critical geological assessment of the area, environmental studies have not been done, the road alignment has not been chosen, none of the purported mitigation measures that are supposed to keep pollution out of the aquifer have been chosen, and then the most critical part of it is the scope is just way too narrow. We're putting blindfolds on and pretending like this is a three or four-mile project when the real project is connecting I-35 all the way across to Mopac and then expanding Mopac all the way north to Ceasar Chavez across the river. That is the real project and I think most state and federal law require that you look at this comprehensively rather than piecemealing.

The real bottleneck is the bridge over Lady Bird Lake and whether that can be expanded through Zilker Park across the river with all the connecters and flyovers right on top of Austin High, perhaps that can be done and the community would embrace that, but that's the part that has to be figured out first before you build this piece and dump yet more traffic onto that overloaded bottleneck. That part of it is backwards,

just like publishing the Draft EIS before the environmental studies are done.

So the document really is woefully deficient and it repeats over and over conclusions for which there's no real analysis or evidence to support. This is the most vulnerable drinking water supply aquifer in the whole State of Texas, there's dozens of caves under this road and we really should have an honest analysis before anything else is done.

Thank you.

(Audience clapping.)

MATT SURINA: Hello. My name is Matt Surina. I live down in Circle C. I guess I'm on the fence on this issue. I would like to be in favor of it. I think the environmental studies are sound, I'm fine with that.

The one issue is there's nothing to address the intersection on Escarpment and the existing SH 45. As it is right now, that's a one-mile stretch. SH 45 is a big road, that's a four-lane road, and Escarpment doesn't have a real intersection, it's just stop signs, you have to stop and wait for traffic. The speed limit is already 70 miles an hour. I'm worried when you add another 3.6 miles, you'll now have 4.6 miles with nothing to stop traffic and it's going to be even harder

to cross. We have had two bad accidents last week. Fortunately nobody died, but there were ambulances, people went to the hospital.

It's just a tough intersection. I would like to see in the plans that there was some money allocated towards an overpass or an underpass, or at the very least a stop light. It's kind of a shame that we're only focusing on the new 3.6 miles when we should be focusing on the entire 4.6 miles and what it's going to do to that intersection, so that's my concern.

I'll be all for it if you put a little bit of money in it to go ahead and fix that intersection at Escarpment.

Thanks.

(Audience clapping.)

RICK PERKINS: Hi. My name is Rick Perkins. I live in Southwest Travis County.

The EIS appears to be thorough and responsive to the environmental needs of our community. And from what I understand from conversations with the design engineers, the SH 45 Southwest highway design will result in a TSS, which I believe is total solids and solution, of less than what is naturally occurring now.

So in other words, by building the roadway,

we are actually -- with the water control features, we will actually be putting cleaner water into the Barton Srings zone that occurs naturally from the runoff. Now, of course I'm not an expert in this, but this is what I understand from the Draft EIS. Now, this is fantastic we're putting cleaner water into the Barton Springs zone than currently exists. Hello, save our springs. Can you hear me?

This is fantastic, job well done. Okay. So we compared to the runoff the total solids and solution that currently occur on Slaughter, on Brodie, other roads that do not have these water control features, we will be much less, the TSS will be much reduced. I don't have the exact numbers. It's obvious they are going to be lower, so I think that's a good deal.

I'd like to say please move this project as soon as you possibly can. And finally, I'd like to ask that -- or add that I think that the current lame duck Austin City Council members should stop this unethical behavior and let the future representatives of the City of Austin make the decisions for the city.

Thank you.

(Audience clapping.)

SUSAN TENNISON: I'm Susan Tennison. I

live off of Bliss Spillar, and I do appreciate the wonderful entrance and exit that you are building just for us, that's really cool.

But my main message is to build SH 45 now. The people in Hays County need this highway. Brodie was not made to handle the amount of traffic it is seeing today. We need another way to get into Austin. We go there now, we are already on Loop 1, we already go to Mopac, we are there, we just have to work really hard to get there.

Please consider adding noise walls to preserve the quiet that we currently are used to in our neighborhoods. I think that the noise walls might also help with the issue that was brought up only once before which is about deer on the highway. We have a huge deer population out there. I think we saw on Highway 130 going to San Antonio, the hogs coming across the road. Well, we're going to have deer going across our roads. The noise walls, they lower the noise and lower the animals in the roadway.

Again, my message is to please build SH 45 Southwest now.

Thank you.

(Audience clapping.)

GERALD GARCIA: Good evening. My name is

Gerald Garcia. I'm a 26-year resident of Southwest Austin off of Brodie Lane. I am a licensed professional engineer, State of Texas, and a credentialed project professional. I have read the executive summary of the Draft EIS and subsections of the complete report and I am here to thoroughly endorse the building of State Highway 45 Southwest. I roughly estimate that my 26 years I may probably have traversed Brodie maybe 20,000 times. In that time period I have noticed increased traffic in time it takes to travel, time meaning resource that no one can have more of. Everyone is allocated a limited amount and when I see people eating in their cars and answering their e-mail and putting on their makeup, I know it's not because that's what they prefer to do, they do it out of necessity.

Some people have talked about other proposals, traffic -- the land management. Personally, I have the luxury of avoiding peak travel times. I know for many of my neighbors, they do not have that privilege. I also am aware of the emergency traffic vehicles and the trouble they have responding quickly during times, watching them snake their way through traffic, and I think that the TxDOT has done an admirable job in their report. I understand it's preliminary, that's what draft means, but it's a step in

the right direction. I think it's time to move forward with building this road.

It's something that people in this neighborhood have pushed for a long time. You are continuing to grow, you are never going to go back to being a college town and state governing Austin. We are now like the eleventh largest metropolitan area in the nation. We are the only large metropolitan area in Texas without a loop system. We need to manage our traffic. And I'm glad for the opportunity to speak to you and give my endorsement for the project. I only wish that our elected officials who insisted that their time is more valuable than mine had stayed around to hear these remarks.

(Audience clapping.)

MARY KELLY-DILLON: Good evening. My name is Mary Kelly-Dillon. I'm a Hays Country Oaks resident off of 1626 and I'm a board of directors member.

I commute from where I live at 1000 Live Oak Loop and I only have two options to get to my engineering position in North Austin, and that's either to go 1626 to I-35 or 1626 to Brodie Lane, and I feel very sorry for the Brodie Lane residents because they have to endure all of the traffic. I'm sure they are tired of the revenue-generating mechanism that's

currently in place for Austin, the speed traps, the issues that are constantly taking their toll.

The last gentleman that spoke before me, yes, many of us actually have to put on our makeup, but I do wait until I get to work to do so. There are issues, I commute an hour each way every morning, so I come home if I come by one of those two opportunities, those one or two options, it takes me an additional 45 minutes. If I leave in the mornings to come to North Austin, I can't go by Brodie Lane, that is really not advantageous, because the time that it takes for me to get through there, up Brodie lane to Slaughter and then onto Mopac, takes me some 40 minutes, 20 minutes at least just to get that mile and a half through Brodie. Then coming back home, there's also the event of having to stop and I took a photograph a couple of weeks back with my phone and as I sat there at the light, I just saw the snake of traffic and we're not -- the traffic isn't going to go away. It's not. I would like to be able to give something back to the quality of my life and to those who also commute, because being in my car two and a half hours each day is really having an impact on me physically.

In closing, I would just simply like to reiterate my concerns about a lot of the accidents that

I'm seeing, which if you happen to have been caught in one of those at Brodie Lane and 1626, you may have to wait some 30 or 40 minutes in order for it to clear.

Thank you, again, and I hope that you will pursue building this road.

(Audience clapping.)

CRAIG NAZOR: Hello. My name is Dr. Craig Nazor. I'm a citizen of Austin, a member of the Sierra Club Conservation Committee, and a regular visitor to Barton Springs.

Science clearly tells us that we are on the cusp of a major global species extinction event. In response to Austinites who have strongly supported the protection of endangered species, the looming threat of global warming is leaving the entire Southwest U.S. facing a water crisis. Austin is already feeling the effects of this threat.

In response, I also like to strongly support protecting clean abutted water particularly in the Barton Springs watershed. I also generally support increasing transportation choices the reduced greenhouse gas emissions that are in sprawl. All of these issues come together on the proposed State Highway 45 Southwest project.

In recent elections, citizens have

consistently supported candidates that oppose building this project unless the best science available clearly tells us it can be done without negatively impacting our water, our wildlife and the traffic flow off the Mopac corridor. Because of this, the Austin city council has wisely voted overwhelmingly not to support this project at this time. Unfortunately, some of our elected officials and their appointments, many of whom are not running for reelection, are undermining the will of the people concerning State Highway 45 Southwest. This is being done by ignoring some of the science that informs this decision that is coming from the City of Austin water quality experts and most significantly by preventing a state of the art federal Environmental Impact Statement from being done. Without this information, it is impossible to claim that this road will not damage the water quality in Barton Springs. This contorted process will also very likely cost the local taxpayer much money as feral dollars are being lost to avoid proper environmental protection agency oversight.

In the environmental community we have a word for appearing to support environmental issues but then not making the tough decisions or taking the necessary actions to see that our environment is truly

protected. It's called "greenwashing."

Look around you. Despite some of our best efforts, it has been going on around Austin for a long time. This project is a poster child for environmental greenwashing. Our children and grandchildren will pay the price.

Thank you for your attention to this important issue.

(Audience clapping.)

CAT YOUNG: My name is Cat Young. I live at 3318 Spotted Horse Trail. My front door, my whole house and my yard face Brodie Lane.

Myself and my five daughters have waited at our corner of Spotted Horse and Brodie every day for ten to fifteen minutes even sometimes trying just to pull out of the driveway, and then we take another fifteen to twenty minutes to go ten blocks to get to Slaughter.

I happen to be your local Starbucks girl. For three years I was down in Buda and traveled that way every single morning at 4:30. Now I go to Circle C. I really want to get to work on time because every single one of you are going to be really, really mad, whether you are for or against this project, if I can't get you your cup of coffee in the morning.

I lived in West Austin for twenty years

right off Bake Street off of 35th Street. I paid $21,000 a year in taxes. And Lady Bird had gotten Mopac built, she built that expressway. It's not a local road, it's an expressway, and she built it right through West Austin where there's more money than most of the rest of Austin, and there's a road there, you all, and people still get to work, they probably get to work on time and the Salamanders are still swimming and we're still going down to Barton Springs and swimming.

This has been going on for 30 years, you guys, and it's cost more for this environmental impact study than it's going to cost to build this road. We live in the fastest growing quarter in the United States right now. We've got neighbors in Buda, Dripping, all over, y'all, San Marcos. Let's welcome them. They want to help us, we want to help them. I want to be local, I want Brodie to be local. It is my neighborhood and I want to be able to take my grandchildren to school and get them there on time.

Thank you very much.

(Audience clapping.)

DENNIS TINGLE: Good evening. My name is Dennis Tingle. I live on Appaloosa Run. For those of you who don't know where Appaloosa Run is, it's about a quarter mile south of the intersection of the existing

45 where it runs into 1826.

This morning just before 9 o'clock, I left my house to go to work. As I got up to the intersection of Appaloosa Run and 1826, I was debating whether to come to this meeting tonight whether it would be worth coming to, to listen to, to possibly participate in, and as I sat at the stop sign at Appaloosa Run and 1826, I counted 27 vehicles coming toward me from south before there was an opportunity for me to pull out from Appaloosa onto 1826. Just from the south, that does not count those that were heading south from 45 onto 1826.

Once I got onto 1826, made a right-hand turn onto the existing 45, it then becomes Mopac and that's where this proposed new portion is going to intersect. As I came up toward LaCrosse, the intersection of Mopac and LaCrosse, I was vehicle number 21 at the light. We cleared the light and as we approached the intersection at Slaughter, the traffic came to a complete stop about midway between Slaughter and LaSalle. It took three cycles of the light for me to get through that intersection.

Once I got on from that intersection onto Mopac and heading toward town, I never got over 55 miles an hour, and I always take the new flyover to get onto 290 to get me to South Lamar where I work. So I get off

of Mopac at that point.

I understand and I sympathize with the traffic problems and the concerns everybody has with Brodie and Slaughter, but to my way of thinking, what we're doing here is we're diverting the attention, we are not changing the traffic. All of that traffic on the new proposed extension of 45 is going to enter Mopac south of Slaughter.

You think you are having trouble getting from Slaughter onto Mopac now, what is it going to be like when you are coming from the 45 extension up through LaSalle through Slaughter? It's going to be even worse. So I urge everybody to consider that option, it has nothing to do with the environmental impact. It's simply a case of, it seems to me, we're redistributing traffic and not addressing the entire scope of the problem and I ask TxDOT to not spend up to a hundred million dollars of our money without addressing the complete traffic problem.

Thank you.

(Audience clapping.)

CHRIS BISHOP: Mr. Patman, we need you to face this way in case the court reporter needs to be able to see you while she's typing that so she makes sure she understands.

JASON PATMAN: I was trying to stand over there so I can see everybody.

CHRIS BISHOP: Well, the hearing is designed for your comments for the record.

JASON PATMAN: I just wanted to talk to the community. Is that all right with everybody?

(Members of audience commenting at one time and saying "No.")

JASON PATMAN: My name is Jason Patman. I rode my bike here today from Austin. It was 15 miles. It's a pretty nice ride. I rode to Barton Springs as well. I had to take the day off work because it's really important for me to do all of those things, actually jump in Barton Springs, before I came out and started talking about the road.

Now the thing about Barton Springs, it's like the last Redwood tree. There is nothing we can do when a big rain comes, it will wash pollutants into the aquifer no matter what systems we have in place. It's impossible.

(Members of the audience speaking at one time and commenting they are unable to hear Mr. Patman.)

JASON PATMAN: Well, that's all right if you don't want to hear me.

Now, if we put roads through the middle of an environmental area, we're cutting the habitat in half and we're reducing those habitats to less than half because now they're in a smaller area, so now we are cutting into -- there are all sorts of species that actually -- I commute on Brodie lane now. I work down in Manchaca where they're building a house. I go down there for two days, I camp, then I drive back to Austin, go down two days and camp, drive back to Austin, I landscape and I paint, and I do it all over again. That area back there, there is a whole symphony of wildlife in that area. I'm camping right off Bliss Spillar and 1626, it is amazing back there. That is nothing that we -- anybody in this room, has the right to carve into. That is God's land. That is the last of it. That is the last of this earth.

(Audience member commenting "We pass it every day.")

JASON PATMAN: We can keep paving over the earth and we're just going to destroy our heritage and the last Redwood, the last Comanche chief is Barton Springs, and we should protect that with everything we have.

Thank you.

(Audience clapping.)

FARID CHADA: My name is Farid Chada. I'm a lifelong resident of Austin and I have had the pleasure to see it grow and change into something that has turned from a sleepy college town into a worldwide, world-renowned place for music and culture and many other things.

I'm concerned that the building of the -- that the scope of these studies conducted now and the conversation that we're having is limited to this particular adjunctive development which I admit is something that needs to be fixed, needs to be addressed, because people that live in this area, that live off of Brodie, that live there, have gotten the short end of the stick and they have been having a difficult situation.

Now, as much as I sympathize with that, I think that by building such a massive project, one which has been established has not been adequately studied is really making something better for a few people while it may be impacting a larger population. I understand it is a difficult situation but that is something that has been happening all over town. This is not just Brodie. You can go onto 2222, you can go onto Lamar, every place in town, traffic has gotten worse. There's more people, that's just the way it is.

I understand that we need to be better, that we need to be good neighbors with Hays County and we need to benefit all of those people. The problem is we need to do that, but at the -- but not by, you know, just the will of Austin the fact that, you know, they had voted not to have this, that also needs to be taken into account. So you can't propose what is beneficial for a few to potentially bringing harm to many people.

Another issue would be if this does get built, it would be interchange heights and those will negatively impact the green appeal of Austin which is one of the main reasons that it is growing because of the fact that it hasn't been completely turned into cement.

Also, by making all these big modifications, it will make it a more -- an alternative for people trying to traverse Austin further impacting traffic. These situations can be resolved by making further improvements to 35 which is already under way we should have this be left to take effect before this is done.

Now back to the environmental. They say 90 percent of solids will be removed from the water. That leaves 10 percent of what's on the roadway will end up in our drinking water, which is very, very unhealthy

and that's still tons and tons of particulate matter.

It conflicts with our city plans, there is also other options that could potentially help our traffic, such as solid street stripes at troubled onramps, enforcement of slow traffic keeping right, left hand for passing only, retiming of traffic lights. And also, it should be taken into account that these plans for 20 years from now that there are excessive advances in technology and transportation which I think need to be studied further, such as electronic driving means that could potentially reduce traffic in 20 years time that hasn't been taken into account for this study and needs to be seen as traffic modifications. Sorry I went over the time.

Thank you.

(Audience clapping.)

JOSEPH DUARTE: Joseph Duarte, a long-term Shady Hollow resident. We have been in the neighborhood for over ten years and experienced the growth, both Austin and then the neighborhood, and then south of our neighborhood as well as Hays County continues to grow. We have experienced both the traffic at peak time and a significant increase in traffic at non-peak time.

Brodie has always been the center of our neighborhood, but as traffic has continued to increase,

it's more the divider of our neighborhood, east and west. As it is difficult to cross the road, our children do not cross the road without being driven to see their friends or go to school on the east side of Brodie.

For those that have suggested improvements to Brodie and Manchaca to solve the problem, it's not a solution. You would further divide our neighborhood and further tear us apart where Brodie would no longer be the center point of our neighborhood, it would be a dividing wall between the two halves of our neighborhood.

I support the development of the highway and plead that it be done in the next few years as quickly as possible.

Thank you.

(Audience clapping.)

ED SCRUGGS: Hello. Thank you for the opportunity to speak tonight. My name is Ed Scruggs and I'm speaking as a Circle C resident but also someone I've been following this issue for years.

Historically I've opposed SH 45 on environmental grounds but also I don't think that it will deliver on the promises it's making with relieving traffic congestion it would also provide tremendous harm

to Mopac which is already at capacity. I think in terms of the EIS which is what we are speaking about tonight, I really would like to see you pull it and make it more comprehensive, because we all know this is more than just the SH 45 project. It's linked to the underpasses of Cross and Slaughter, it's also linked to the toll lane on South Mopac. None of these projects would exist without SH 45.

The issue that I have is neighborhoods in the South Mopac corridor will be impacted by all of these projects. The time lines are right on top of one another, and if it all goes through as planned, that will be continuous construction for years at a time one project on top of another one. If something happens the link to these projects and there is a delay in one of these links, that has an different potential impact on the neighborhoods, the ability to get in and out for example, after dropping kids off at school, cut through traffic at Escarpment, et cetera, and this is not really being looked at at the same time so I wish you could do that.

But also something that came to my mind tonight looking at the schematic back there was the interchange of 45 and Mopac, there is one entrance and exit to a new subdivision called Great Rock Ridge and

about 400 homes that is currently building out, and that is Archuleta Boulevard, I believe. And currently the interchange has that one point on basically the onramp for folks heading north on Mopac coming from 45 from the west. We have had terrible traffic problems there, two terrible accidents in the last week including a mom in a minivan with her kids that was broad-sided and also accidents at Escarpment, which was mentioned earlier.

This project will have a tremendous impact on those intersections, those folks in the Great Rock Ridge development have been demanding a light for some safety, and under this plan and schematic that will be impossible to put a light there now, so I urge the engineers to go back and seriously look at doing something about that. Because these folks, I believe they only have maybe 50 homes built now, that problem is just going to get worse, so I hope we take the time and look at this. Not only is it going to worsen should the project be built, but if it is going forward, please take a comprehensive view.

Thanks.

(Audience clapping.)

CARY WYMAN: This is a really bad idea. It shouldn't even be considered without first fixing the lights on South Mopac, I mean, the LaCrosse light and

the Slaughter light which now are overwhelmed by -- you know, they just don't handle the northbound traffic. There's already a better solution, Interstate 35, and which connects to 290, and has already been supported by a toll road off to the east there which should theoretically offload excess long-distance traffic.

So the money could be better spent improving access to 35 so that people from the south can use that highway instead of going through Shady Hollow or adding to the traffic congestion on South Mopac.

There is a problem at Shady Hollow, but why not just close Brodie Lane during the heavy traffic hours so that that neighborhood is spared the excess traffic. Let the traffic go -- on 1626 go over to 35 and go north from there.

(Audience clapping.)

ROB BAXTER: My name is Rob Baxter. I'm the president of Friendship Alliance of Hays County, which is an alliance of five subdivisions along the 1826 and 290 corridor.

We are protesting this to some degree because we don't look at the EIS, well, we can look at it, it isn't done yet, it's not ready, that's what we are really here to talk about today. But one thing we have noticed throughout this process is keep hearing

that Hays County is for this, but I don't know anyone along 1826 that is for this. This will not help us, this will increase our commute. I'm somewhat amazed at Shady Hollow folks, I understand the problem. I almost bought in Shady Hollow. I appreciate what is happening on Brodie, but adding traffic to Mopac is not a solution and it's not going to -- in time, Brodie will still be a problem, creating more traffic on Mopac, it's just going to push it further back south.

There are other solutions. I think they involve traffic lights, I think they involve intersections, I think they involve overpasses, but spending a hundred million dollars right now to do this is not a solution, not for right now, and it will not help anyone along 1826.

In fact, prior, two people ago, commented on the accidents on 45, and that will only increase. That will only increase. It is not going to -- and in our commutes, we talk about a couple of minutes being shaved off somebody coming on 1626 from Brodie, our commutes will be -- ten or fifteen minutes will be added onto the 1826 commutes.

So as a resident of Hays County representing almost a thousand people that live along that corridor through those subdivisions that we are

joining running our organization for, we are generally not too thrilled about this.

Thank you.

(Audience clapping.)

JONATHAN STEINBERG: Good evening. My name is Jonathan Steinberg. I'm here as well representing Friendship Alliance. We've submitted written comments. I just wanted to make these written comments verbally as well.

As Rob Baxter indicated, we represent five subdivisions with over thousand residents along 1826. We have reviewed the Draft EIS and we find that it is incomplete. We note three areas in our comments where we find it incomplete. The first one was provided by Mr. Ott in the City of Austin that there's more studies that need to be completed in order for you to do a proper and full Environmental Impact Statement, there are current studies going on that directly address those impacts, there is no way that this EIS can be complete until the studies are completed, therefore this traffic EIS, how are we going to comment on it if it's incomplete? It should be withdrawn for that reason.

The second reason that we provide is that the TxDOT rules require that a Draft EIS include a description of the direct and indirect cumulative

effects. This Draft EIS does not adequately do that. The study seems to indicate that -- or the EIS indicates that the land planners said, well, all that property will be developed anyway, so therefore it's not going to have an effect on development. The matter of the fact is, is that if you build this highway, there is going to be an increase in developmental increase in that development in a shorter amount of time, those impacts need to be assessed properly in order for the Draft EIS to have full meaning, it doesn't do that, and consequently it's inadequate for that purpose.

And thirdly, the Draft EIS does not adequately assess the water quality impacts. If there is still a 90 percent clearing out of the water, improving the water quality only to 90 percent, there is still a 10 percent impact. You can't say that there is a minimal impact or it's minimized because you're complying with environmental regs, you have to assess what's being done, what is actually flowing into the aquifer in order to make that assessment.

For these three reasons, the Friendship Alliance finds that this Draft EIS is inadequate causing you to withdraw it and clean it up before it's considered by the public.

Thank you very much.

(Audience clapping.)

LYNNE ANDRIS: Hi. I'm Lynne. I live in the City of Austin and I also live in this neighborhood. I live at 2705 Dupree, and I vote, and I'm here, mostly, I think, to talk to my elected officials.

I think I care more about Barton Creek as a part of this much more than anybody here who are non-disposable, but I'm also a registered nurse and I have watched in horror over the years that I have lived in Brodie as it becomes impossible for EMS to get into my neighborhood.

I also experienced because I'm a call triage nurse and I'm on the phone with a mother with an asthmatic kid that's turning blue she told me and an address that I recognize as being in my neighborhood and I'm on the phone with her, we're trying to keep her child, a little bit of a stretch and really alive, while the dispatcher from EMS tells me that yes, the ambulance is on Brodie Lane but it's going to be another ten minutes during rush-hour traffic.

So I'm asking that the elected officials have the courage to stand up to special interests that I know it takes courage because they really affect money in their vote, but also think about our neighborhood and how important it is to us that we get what was promised

20 years ago, but we've watched money go -- Manchaca was supposed to be four lanes, it's now down to three, our money has gone north, Mopac is being expanded. We need them to act, to have the courage that mother had to keep her child alive, to be able to make sure that doesn't happen again in the future.

Thank you.

(Audience clapping.)

JAMES MOSELEY: My name is James Moseley. I just wanted to thank everybody for being here. I don't want to stir anything up, but I do think this is a suboptimal way to communicate when you're basically speaking to a court reporter or a brick wall versus an elected panel of officials for these people. So maybe for future presentations you could consider how when people speak, I'd personally like to speak to people, not to a brick wall.

I'm kind of ambivalent -- I live in Circle C -- about the 45 Southwest project. I've always been approached about transportation and people are right that cities like Austin -- excuse me -- Dallas, Houston, San Antonio, have loops around the cities, and they seem to have planned their transportation better. But this project right now seems to be backwards, and I know I'm echoing what some other folks have said, and

that's, you know, the cars coming up Brodie and down Slaughter or even Mopac, that is correct, once you build 45 Southwest, there's definitely going to be some folks that travel on I-35 that decide to take 1626, 45 Southwest to Mopac.

And Mopac on the south side is really bad, as everybody knows. They've already started to manage toll lanes and things like that on the north side, but there's bottlenecks all over the place on the south side from the Town Lake Bridge to the underpass that's at Loop 360 to the Barton Creek Bridge to the relatively new interchange at 290 and Mopac. And what we're going to do is we're going to add more cars to the south side of Mopac by building 45 Southwest now, than actually doing the right thing, which is to put the improvements on Mopac.

Now, I know they're studying it right now, I've already talked to someone from the CTRMA, but projects such as underpasses at Slaughter and Mopac, LaCrosse and Mopac, and all the bottlenecks that I have already mentioned on the south side of Mopac, South Town Lake, that is, could be two to five years behind completion of 45 Southwest.

And so like other people have also said, it's not just this three-mile stretch of highway. It

will be connected to the existing 45 which is connected to 1826 which is connected to Mopac which is connected to Town Lake in the North side of town, and so you can't build 45 Southwest in a vacuum, and unfortunately, for politics and other reasons, we've kind of gotten things backwards where we're talking about completing 45 Southwest before the proper improvements on the south side of Mopac are completed. So those are my comments.

Thank you.

(Audience clapping.)

COLLEEN GARLAND: Hi. I'm Colleen Garland and I'm a resident -- I live right between Brodie and Mopac so I'm also affected by the traffic issues out here.

Where I disagree with a lot of the traffic argument here is that I don't believe that more roads are a solution. I know that the population growth is exploding and I don't agree that more roads and more cars will help. I think by the time this project is completed, if it is, it's going to be a traffic problem from day one.

There's other solutions I would like to see considered such as I live off of South Brodie and there is not a single way for me to take a bus north of Ben White, or even north of William Cannon, for that matter,

so that seems like a solution is to consider before 100 million dollar road project.

In addition to a resident of Southwest Austin, I am an environmental scientist by career. I have been an investigator for the Edwards Aquifer program as well as an environmental educator. I've been out to these sites, I've seen the sensitivity of these recharge features. Those features in this EIS proposal none of the buffers were discussed, I didn't see them. I don't feel like we can give them proper comment about the protection of any of those recharge features when the buffers aren't mentioned. It seems incomplete. It seems incomplete that we can't comment on those or if we are supposed to comment on the building of the road without knowing the true impact or the protection features that will be given for those buffers.

I guess in conclusion I just want to say that I believe that this road is expensive and shortsighted, a no-win solution to a problem that we need to look at multilevel.

Thank you.

(Audience clapping.)

ROBERT CORBIN: I'm Robert Corbin. It's interesting that we are having discussion now, because I've been around for about the last 30 years and every

road, every development, every road builder, every developer always promises that their project doesn't create any pollution and that the water that they are going to put into the aquifer is going to be cleaner than natural rainwater. Well, the fact is, you can go down to Barton Springs pool and you can look at the water there now and compare it to the water in New Braunfels or San Marcos where we don't have this development like we have in Austin and you can see the difference. It can be cloudy for 30 days after a rain event now in Barton Springs. So all of these people have been claiming like is being claimed now that all of this water is going to be pure and it's going to go into the aquifer so pure, that is not true. Basically everybody has got a project that they are going to develop something over the aquifer, basically they're lying to the public, and Barton Springs pool proves it now. Just go there and look in two weeks after a rain event and see how cloudy it is, how dirty it is, how filthy it is compared to the way it used to be. So there has been a lot of false claims being made so to expect this community, the old-time community I guess in Austin, to accept the fact that you all are going to do this right and it's not going to have any effect on the aquifer, we don't believe that.

Also, Texas now is going to spend two billion dollars or something like that on water projects. We've been given this Edwards Aquifer. It's been created there, and it's there and it was basically a freebie for us. And my understanding is it provides drinking water for something like 50,000 people. It provides water to Barton Springs, the soul of the city, the soul of Austin. And how much would it cost to replace that? How many billions of dollars or hundreds of millions of dollars would it take to replicate the aquifer that we have now? We should be spending money cleaning up our aquifer, not setting up a situation that is going to cause more pollution to go into the aquifer.

If you were to build this aquifer, I mean, this road -- excuse me -- this new road, my bet is it might for a year or two relieve traffic congestion, that's a possibility. I bet within five years everybody is going to be just as congested on the roads down here as they are now, and they are going to be wanting to build new lanes, more roads, more upgrades to roads. It's just a vicious circle.

And that's it, three minutes. Doesn't seem like it.

(Audience clapping.)

BERT GARZA: Hello. My name is Bert Garza

and we live in a subdivision in Buda, so I am definitely affected by the commute each and every day. We have lived in Buda about the last ten years. We lived in Austin fifteen years before that. So the reason I support the road, the reason I support SH 45, is that I refuse to believe that the status quo is more environmentally friendly. I don't think that congestion is environmentally friendly.

And the situation today is that we're asking everyone to accept that the only way to get to Ben White, or down Mopac, is to go down Brodie, and I don't think it benefits anyone to have all of us, have not hundreds of cars, but thousands of cars sit at the lights at Brodie and Slaughter each and every day, I don't see that as being environmentally friendly.

Now, there were other issues that were brought up as far as mobility and EMS having adequate access, and I think those are all good reasons, but in the end this is also I think the solution for all of us and I think it's unfortunate that it's been presented as an idea that will either help Hays County or help Travis County because I think it's a solution that can help all of us.

And as far as the impact on the environment, I refuse to believe that one road will shut

down an aquifer. I don't see how one stretch of road will have an impact on a structure that has been here millions of years. So I think my perspective is that we should have faith in our elected officials and in TxDOT to get this project done right and to make sure that it's environmentally friendly.

Thanks again for your time.

(Audience clapping.)

PAM BAGGETT: I'm Pam Baggett. I'm with Shady Hollow board of directors and also the Keep Brodie Local group.

It occurs to me that, you know, SOS should declare victory and celebrate the exemplary environmental design of this road instead of making it their last stand and I hope it's Custer's last stand.

Is Mr. Bunch concerned about the environmental impact of the bicycle bridge being built over Barton Creek? Where is the EIS on that? Regarding the SH 45 EIS, we already had a federal one that SOS filed a suit against, caused it to expire over time, so -- we know that this can be done in an environmentally responsible way.

To those neighbors -- and by the way, what's better -- what's better, to have a four-lane divided road with the best of environmental engineering,

or to funnel that traffic onto a two-lane neighborhood street with children? That is a no-brainer.

To those neighbors in Circle C who oppose 45 because they don't want the traffic, they should understand we don't want the traffic either. They should support the overpass at LaCrosse and Slaughter. Tell the city council to get it built right now.

Most of you probably weren't here as Circle C was developed, but Shady Hollow didn't oppose you, so please do not oppose efforts to keep our neighborhood safe.

The City of Austin did not participate in this study. Why not? They were invited to do so. Mr. Ott tells me he doesn't know why not, or what the city staff did or did not do, yet he wrote a letter in opposition at the direction of the Lame Duck Council. So let's hear it for the 10-One system. Mr. Ott lives in Circle C.

Ms. Morrison said SH 45 is not in the city plan, that it was taken out of the plan. Actually, I attended those meetings and they refused to even discuss 45. They predetermined that it wasn't going to happen. They shut us down on any discussion of it.

So opposition -- excuse me -- by the way, people talking about their tenure in Austin, I've only

been here since 1964. My husband's grandmother was born here in 1878. We still have land along Old Fredericksburg Road, so we have some interest in what's going on in this town, and my grandchildren live in Kyle so I travel 1626 a lot.

It seems to me opposition to 45 comes down to intentional ignorance or the not-in-my-backyard people who are new to the area.

Build it now.

(Audience clapping.)

BILL ALESHIRE: My name is Bill Aleshire. My homestead is at Brodie Lane and Slaughter Creek Bridge. I've been there since 1987. I've lived in Austin since 1970 and I was the County Judge of Travis County when we adopted the Balcones Canyonlands Conservation Plan when we called for the election in 1997 for voters to be able to specifically vote on whether or not to authorize county bonds for the right-of-way for this SH 45 lane between Mopac and 1626. And at that time we supported the project if it was built in accordance with the consent decree between TxDOT and the aquifer district, and my position is still that it should be built consistent with that consent decree. It will not violate the BCCP. The BCCP knew about this project. It was part of the transportation

plan at the time.

But I want to speak especially to the notion that if you don't build SH 45 even with the environmental protections in it that it's okay to put all that traffic on Brodie Lane. It is unconscionable and I am just amazed at the cavalier attitude of the City Manager Marc Ott and the city council members about putting all that traffic on Brodie or making Brodie into a freeway.

Look at the environmental impacts along Brodie Lane. There is a whirlpool, a sinkhole, going right into the aquifer downstream from Brodie in Slaughter creek. There is the Kentucky sink just north of the Shady Hollow subdivision on Brodie Lane with no environmental protection at all. I believe that if the city was really sincere and concerned about protecting the aquifer, they would be concerned about all the traffic that's on Brodie right now going by those significant karst features, aquifer recharge features that are there.

It is just unconscionable to consider the bulldozing of 160 homes in my neighborhood. They wouldn't do that to any other neighborhood. You have got to understand what the council is doing. Asking you to withdraw the EIS is a stall tactic. This council

opposes SH 45. If they were interested in environmental studies being considered, why didn't they start them earlier? They have known about this project for years. They are going to tell their staff go as slow as you can. If you fall for that tactic of withdrawing the EIS, it will just kill the project, and the city staff is not free to take any position even with their professional opinions opposed to this council's prejudice against SH 45.

We need to build it and build it right.

(Audience clapping.)

PETER BECK: Thank you. I'm Peter Beck and I'm the Associate Professor of Environmental Science and Policy at St. Edwards and I'm also with the Austin Sierra Club. And my main point is that EIS has a lot of good points to it, but it's incomplete and it needs to be finished before we can have an honest assessment of it.

And as several people have noted, the City of Austin, Marc Ott, just wrote a letter asking for that very thing, noting that there's crucial studies of karst features, endangered bird habitat and the drainage basin of Flint Ridge Cave now be completed.

And I'd just like to point out this is Marc Ott. This is not someone from the '90s green council,

and so if he's saying that, he's saying that because it's true. And when you look through it, there's numerous references in the document itself that there's studies that have yet to be completed. And I'd just like to cite a few of them: Karst landscapes have unique hydro-geography that result in aquifers that are highly protected that are vulnerable to contamination.

This is cited, but then it says: The karst investigations are currently underway by professional geologists in a state-owned right-of-way and a geologic assessment is pending.

Now, that's on page 92. And so that's great that professional geologists are looking into that, we support it, but why are we talking about the assessment now if we don't know the results? Just one more karst survey by a qualified geologist is currently being conducted to further evaluate the habitat and the presence of threatened and endangered karst species within the state-owned right-of-way, a future iteration of this EIS document will be updated with results of this survey upon its completion. That's on page 230, so I actually did read the document.

But if it will be updated and we don't know the results, how can we get an honest assessment of it? So if my student turned in a paper and they said, you

know, it's not really complete but will you evaluate it and grade it and then I'll put in my results later? I would look at them and say, No, you put in your results first and then I can evaluate. And that's what I'm asking TxDOT to do now.

I would certainly not say it doesn't matter if it's complete or not, that's just fine, and I would certainly not say when you go out in the real world and you have a job, it doesn't matter if it's complete or not, just turn something in and that's okay. And so I hope that you will not make a liar out of me by saying that.

My second point is that we know that this -- that going to four miles from Mopac, when it's seven miles to I-35, this is -- it doesn't make any financial sense, it doesn't make any practical sense. We know that the project is going to go to I-35 or building a toll road doesn't make sense, so include that in the entire survey and go back and do it.

Thank you.

(Audience clapping.)

STEPHEN BEERS: Thank you. Claims have been made that this road is the best thing since sliced bread. It's going well beyond the letter of law protecting the environment. There has even been claims

that the pollution will be below naturally occurring levels. There's at least three sufficient reasons to prove these claims are false. You don't have to read the whole thousand pages of report.

First off, it's admitted by everyone that the state EIS is intended to evade federal scrutiny under the National Environmental Policy Act. So with respect to passing objective reviews, this is not the most stringent standard. TxDOT is grading its own homework rather than the Federal Highway Administration. If we're that confident that the project has a negligible impact that is indeed state of the art, why did they not submit the same document to the feds? That is the federal standard that it misses.

Second, the project doesn't come up to existing standards set by other states. There was a proposed rule -- well, first off, discharges from large construction sites are really messy are usually measured in thousands of turbidity units in the EPA proposed in December 2009 to reduce it 280 turbidity units, but the rule was withdrawn. That's a huge decrease. Well, was it practical? Was there existing technology?

Well, TxDOT sponsored a study that A&M did with UT and Texas Tech researchers, it was just published in May 2014 and they surveyed all 50 states to

see what they do right now before this EPA rule.

Washington State, for one, says turbidity shall not exceed 5 NTU -- that's the turbidity unit -- over background turbidity when the background is 50 NTU or less, and then they also voluntarily adopted EPA's 280 NTU limit. So it's also worth knowing why they were so strict, they had endangered species, salmon, and they wanted to protect their water. We have the same situation here. If they can do it, why can't we?

Let's talk about the high-tech methods proposed by TxDOT and translate them. Grassy swales, roadside ditch, vegetative filter strip, grass and dirt, detention pond, hole in the ground. They claim 90 percent removal of -- what I wanted to say also, they flunked the federal standard, they flunked the state standard. They are also flunking the local standard, because they ought to be at 15 percent impervious cover, instead it's 24, they ought to flunk -- they ought restrict to non-degradation the 13 contaminants in the SOS ordinance, they only have one.

So I think it underperforms on every standard. You cannot call this a superior environmental standard.

Thank you.

(Audience clapping.)

ZACH CAUSEY: I'm a long-time resident, born and raised in Austin. I care a lot about the soul of our city, Barton Springs, the water that comes out of it. I do think this issue of a highway to be solved through other means, mainly public transportation increases many people the fact that there are no accessible ways to use a bus or any sort of public transportation down south.

EMS is a huge issue, but I think redistribution of resources, namely military, we have plenty of helicopters on hand we can use these and we don't have to just have them on-call all the time. We should have an overly protective stance on the environment. Think about our grandchildren and our great-grandchildren. I know this highway isn't going to kill the aquifer, but as has been stated before, there is no clean construction. Tar, oil, things used to create asphalt, they are not clean, they are petroleum-based products. You put petroleum down in the aquifer, it stays around.

No water quality means no health. We are 90 percent water. Our cells are made of water. Think about the water that comes out of Barton Springs. It's been stated that it's cloudy and it's disgusting compared to other pristine streams in the area. This is

an natural place and we have one of the most beautiful springs in Texas and we are considering destroying the recharge zone in the name of traffic? Go ride your bicycle, you know, take the time and the energy, or just live closer to where you work. We commute hours just so we can continue our status quo of paying for our jobs and paying for our houses and our luxuries. Why don't you just change your lifestyle and consider the impact that you would have as an individual on not only your health, but the health of those around you, your friends, your family who would be inspired by the changes you might make.

We are setting a precedent here. If we were to develop this road as has been stated it's a section, you know, it does affect traffic on Mopac. Mopac is still its southernmost region. It's still traffic lights. You're still going to have those backups and they may be worse because we're going to have more people who want to use this highway. And I know it's been stated that we can clean it up with grassy swales, but if you understand what berms and swales are, swales only retain the water and it's still going to drain into the ground. It's not going to clean it up. Yes, it might reduce it by 90 percent, but that's not 100 percent. That's still petroleum-based

products in our water. I care about water and I hope you do to.

Thanks for your time.

(Audience clapping.)

CHRIS BISHOP: The comments received tonight at this public hearing as well as written comments submitted before the end of the comment period which ends on Wednesday, August 13th, will be summarized, analyzed and responded to in a report. The final public hearing report including the response to the comments will be made available to the public on the project web site. Once again, that is www.sh45sw.com and then will also be addressed in the final Environmental Impact Statement.

This concludes our public hearing. Thank you for attending.

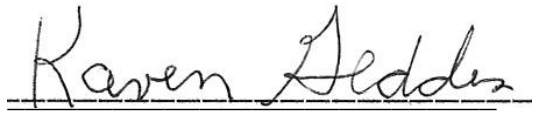
Last in this log is 8:54 p.m., the hearing is officially adjourned. Good night.

(Hearing adjourned at 8:54 p.m.)

CERTIFICATE OF COURT REPORTER

I, Karen Geddes, a Certified Shorthand Reporter in and for the State of Texas, before whom the foregoing comments were taken, do hereby certify that the comments were taken by me in shorthand at the time and place mentioned in the caption hereof and thereafter transcribed by me; that said testimony is a true record of the comments given by said citizen; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this Open House was taken; and further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Certified to by me this 8th day of August, 2014.



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TEXAS DEPARTMENT OF TRANSPORTATION

PUBLIC HEARING

RE: STATE HIGHWAY 45 SOUTHWEST

IN TRAVIS AND HAYS COUNTIES

(COMMENTS MADE OUTSIDE OF HEARING)

JULY 29, 2014

6:00 P.M.

AT

Bowie High School

4103 W. Slaughter Lane

FREDERICKS REPORTING & LITIGATION SERVICES, LLC
WWW.FRLTEXAS.COM (512) 477-9911

Austin, Texas 78749

MS. FOREMAN: My name is Betina Foreman and I'm a resident off of Brodie Lane for the last 12 years. I have watched the traffic grow on Brodie exponentially. When I first moved into the neighborhood 12 years ago I could get off of my street and onto Brodie in zero minutes to five minutes tops. If there was a lot of traffic maybe five minutes. I've watched that grow. Now when I'm trying to get off of my street and onto Brodie to get to work I've seen my travel time go from 15 to even 20 minutes waiting to get off of my street and onto Brodie into the five-mile-an-hour or less traffic to get up to Slaughter and the parts beyond.

There are -- for the last 10 years there have been about 100 people a day moving to Austin. In the last seven months that's jumped to 150 people a day moving into the Austin Metro area. And many of them are in far south Austin and in Hays County, which includes part of far south Austin. Therefore, we need to have adequate roads and adequate school's infrastructure to handle that influx of people that are moving into Austin. And for people in north Austin to say that the road is unnecessary is ridiculous. They are not seeing and living and experiencing the problems -- the traffic problems and congestion that south Austin is having.

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The Mopac local people say that it won't make a difference to get cars off of Brodie and put them on SH45, but I'm here to tell you that it will because I know that if

20,000 -- say 15,000 cars a day are routed off of Brodie, my neighborhood street, and onto a highway, which is what Mopac is is a highway, that the traffic in my neighborhood would be far less. And they keep screaming about the environmental concerns, and the fact is Brodie Lane is a 40-year old road that was built with 40-year old environmental standards and 40-year old environmental protections and the new road SH45 would be built with new 2014 standards that would far better protect the salamanders and the water quality and everything that those people are trying to save.

I know that there are about 5,000 -- five to 7,000 cars a day using the Toll Road 130, and when they did the car count on Brodie last year they determined that there are about 20,000 cars a day using Brodie Lane, which is a neighborhood street that's not built to handle that level of traffic. And the runoff from all those engines, the oil and gas and emissions and all that is going to filter down into the water supply as well and that road is not built to handle. So we need -- we desperately need to build SH45 to help the people in Austin that live in Hays County get up into Austin so they can get to school and to work and whatever their business is.

I guess all I really want to say is that I really want them to build the road. It was needed -- they determined the need in the 1980s, they bought the land in the 1990s and the 20-year lag between purchasing the land and building the road,

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to me, is ridiculous. There have only been more people moving here. The traffic is not diminished, the population is not diminished. And the gentleman said in 2035 there was going to be a 50 percent increase in the number of cars on the road and that's just crazy. We need to build the road now because it's not a situation where if we don't build the road the people won't come. The people are coming, the people are here and it's just going to get worse and they need to build the road now so that we can get out of our homes and go to our jobs to be able to afford the taxes that we pay on our homes.

MR. HALL: I'm a resident of Bridges of Bear Creek. My name is Chris Hall. And my comment is regarding the lack of ability and oversight into Brodie Lane and making sure that we don't use the State Highway 45 project as an excuse to not still consider alternatives to making Brodie an easier commute and transfer of local residents from the Brodie Lane area south of Slaughter Lane into the Austin community at large.

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One of the things that I had actually contacted the City of Austin about was to study or look into the possibility of making a contraflow lane or some sort of middle lane that can go outbound in the morning during rush-hour traffic and alleviate some of the single file congestion that we deal with on Brodie on a day-to-day basis and inbound direction in the afternoons to alleviate the return traffic from an afternoon commute.

So it would look essentially something like a residential area in the Houston, Texas community called Rice Village or the Rice Village area between, say, Kerbey Lane and Montrose. The direction is on Alabama going west and eastbound, and it's a perfect example of where the constriction between expanding the roads was not an option because of the community being too dense. Businesses, residential areas not having any ability to widen or relocate so the only alternative was to create a center lane that they use bi-directionally. So this is an alternative and I just didn't want the State 45 project to diminish the fact that it still needs to be evaluated for Brodie Lane's traffic. Thanks.

MR. TENORIO: My name is Mike Tenorio. I live in Circle C and I'd like for this team to look a little further at the bigger plan. The traffic coming in from 35 and coming through our neighborhood in Circle C is a major concern for me, and I feel that that ought to be looked at. This is just a small piece of the puzzle that's being built and with other parts of the road being built in the future I think it's just going to bring more traffic over to Circle C and Mopac. I kind of feel like this is a stuff job. The environmental study doesn't sound like a full study has been done and I think that has to happen before we move forward with this building of 45 Southwest.

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MR. CHADA: I would like to first state that I am

in favor of traffic patterns and more studies and more analysis being done there because it's something that needs to get resolved in such a fast-growing place. That being said, I think that while this particular traffic -- this particular addition, the southwest linking from Mopac to 1626, could potentially be a good idea barring environmental impact, which has not been studied fully, which is something that needs to be taken into account as a larger project. While that could potentially be a good idea to alleviate traffic, it doesn't address the fact that there is already traffic backup from Mopac all the way out to the existing sections of SH45 and that's something that won't be fixed. It will only be made worse with this construction.

I do feel for the people that are on Brodie Lane and I think something needs to be done to alleviate their issues, but I don't think this is the right idea. I understand they're having troubles, but so is everyone else in every other part of Austin. 15 years ago there was no traffic on Southwest Parkway. Now there is approximately seven, eight times as much traffic as there used to be and that's something that residents need to deal with. Lamar used to have less traffic. Now there is a lot more traffic. I-35 has more traffic. Residential roads have more traffic. Everywhere has more traffic. So I think it's unfair that because one section -- one tiny section is unhappy with the amount of traffic they're experiencing that everyone else should have to suffer the consequences of an ill

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thought out or poorly conceived plan to alleviate that congestion.

Another concern that I wasn't able to voice during the verbal comments during the presentation was the fact that this is being planned as a toll road. Regardless of anything being constructed, I think that while tolling does provide a way of funding, I think that it is -- creating roads is something that the government should do without private companies profiting and benefiting from it. And I think that's something that if tolls are put later on to make an express lane for emergencies and HOV lanes that's something that can be done but not tolls as they are on other roads here in Austin.

Another issue that could potentially resolve the traffic situation, for example at Mopac and Slaughter, would be adding an interchange or a traffic highway exchange there. The problem with that would be the destruction of what would be a more -- the less developed view in that area that's more natural as of now. Adding giant highways popping out will only help destroy further the green and natural aspect of Austin, which is something that everyone that -- I have friends and family from all over the world that come to visit. That's one of the things that they most enjoy is the fact that there is such natural beauty everywhere, something that could be destroyed by the addition of these highways.

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As to the environmental impact, I think that the

project as a whole needs to be evaluated because despite the fact that this preliminary environmental impact study that they have done seems to be within the bounds of what's acceptable, it is an inadequate study. I believe that it should be taken, like I said, as a whole and it needs to be evaluated by third parties and the scientific community and not a -- it needs to be further evaluated.

TxDot's own analysis shows that building of 45 Southwest will increase traffic congestion in other places. Mopac is already having issues. By adding this connection, if a further three-mile stretch from 1626 to 35 is built, it will create an alternative route for people -- potentially create an alternative route for people wanting to traverse Austin through a congested 35 further increasing traffic and large vehicle traffic on Mopac which will make it even worse considering that now due to the addition of those toll lanes, Mopac lanes are now thinner which will just make having 18-wheelers going down there even that more daunting. Further up break 35 to alleviate traffic throughout town would make more sense and keep less thru traffic off of Mopac. I'm switching back and forth here. I'm sorry.

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As to the environmental aspects, while they say that 90 percent of solids will be removed from drainage water, that still means that 10 percent of dissolved solids will still be in that water, which amounts to tons and tons and tons of

dissolved solvents even over a relatively short amount of time. Like I mentioned, this 3.6 mile stretch between the tip of what is now Mopac to 1626 is just a tip of the developmental iceberg. And not only environmental but traffic studies need to be conducted as a whole with the whole project put in place.

I think that these plans are in place to deal with the projected traffic 20 years from now, but I think that technological advancements as in inner-vehicle communication and driver assisting features haven't been taken into account. If those are taken into account traffic congestion could be greatly alleviated without the addition of roadways simply by electronically aided driving and the reduction of traffic would benefit us.

In the event that roads do need to be built, I think that alternatives to these large scale flyovers need to be considered such as the models that are seen throughout Europe where aesthetic reasoning limits their visibility while not --

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while not necessarily impacting their usability. Other options to just building more highways would be taking into account, like I said, the technological advancements that could be had in the near future as well as other more concrete, more immediate things that could be done.

For example, on southbound Mopac where you have a congested spot for the on ramp underneath Barton Skyway, congestion happens from people switching over from the far right

lane to the middle lane over to the other lane to avoid this traffic. You have solid -- solid lane stripes preventing from switching lanes at these problem spots. It would alleviate some of this congestion. Also enforcement of left lane for passing only laws and slower traffic keeping right laws would also further -- while maybe not impacting during peak traffic times, would prevent traffic from starting earlier, would just delay when traffic starts because it would maintain optimal traffic flow for longer periods of time.

In addition to this, re-timing and reconfiguring intersections so that they more accurately reflect the flow of traffic as it happens would be beneficial as well as the addition to more smart traffic light censors throughout the area.

I think it would also -- it must also be taken into consideration that Austin -- the City of Austin, the city council have expressly rejected this proposal adding this road for environmental and traffic situation. And I think that while the well being and benefit of other counties needs to be taken into account and we as a community need to help as much as possible, doing so by negatively impacting -- helping a few by heavily impacting a larger amount of people and potentially the environment and the appeal of a city for its green nature is ill advised and ill thought out and this is something that needs to be further reviewed and further evaluated before it is

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continued.

MS. WATTS: My name is Allison Watts and I live at 12325 Barras Branch, Austin, Texas 78748. My home sits right off of Frate Barker Road and I too have to deal with the traffic every day. I strongly encourage all of our elected officials to move forward with this plan as soon as possible. Something that hasn't been mentioned in all of the other speakers is a long time ago there were studies done federally showing that it's okay to go at a faster speed than 55 miles an hour and that's why we saw an increase in our speed limit to 70 and now we've seen the same thing happen in Texas to 85.

Because studies show that the less amount of time that people sit on the road in actuality lessens their chance of any sort of car accident. Their attention to driving is stronger in the first few minutes that they're on the road and if we can decrease that for people then we're also increasing their safety. If you add up the amount of time that people will save in one single year if they now take the toll from SH45 from Bliss Spillar rather than through Brodie Lane, the 11.4 minutes versus the 37.8 minutes will actually save that person 10 days of their life in one single year that they're not sitting on the road. We're not only talking about quality of life, we're talking about their safety. We're talking about the children's safety that walk home from Baranoff Elementary and ride their bike home, which I see every day. We're talking about also the

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quality of life.

I feel that with the EIS that's been presented, that while there may need to be additional changes and studies and attention to detail that we've seen by our elected officials in this study will continue. I feel that it addresses the water quality issues. I feel that the Austin city council that has put our funds off on other projects that do not benefit the quality of life for the surrounding areas of the downtown population should be held accountable for that. I feel that if we continue to neglect this Austin will turn into the crisis that LA has, that Houston has and that New York has. While there may be an increase in population and we need to build additional roads above and beyond the SH45 to continue to improve traffic as we do continue to populate this city, that attention to detail that's been paid through the EIS here by our elected officials will continue.

Once again, I strongly, strongly encourage this road to begin and further studies to always take place to make sure that we're always ensuring the water system supply for our future children.

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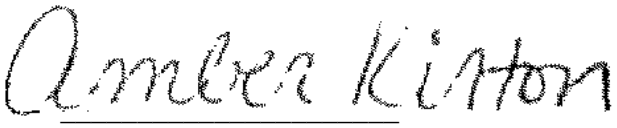
STATE OF TEXAS)

I, AMBER KIRTON, CSR, Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the above and foregoing contains a true and correct transcription of the comments made outside of the above-referenced public hearing, and were reported by me to the best of my ability.

SUBSCRIBED AND SWORN TO under my hand and seal of office on this the 8th day of August, 2014.



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SH 45 SW
ENVIRONMENTAL STUDY

Attachment J

Agency Comment and Response Report

AGENCY COMMENT AND RESPONSE REPORT

for the SH 45SW Public Hearing held July 29, 2014

SH 45 SW
ENVIRONMENTAL STUDY

State Highway (SH) 45 Southwest
from State Loop 1 (MoPac) to Farm-to-Market (FM) 1626
Travis and Hays Counties, Texas

Prepared for

Texas Department of Transportation

December 2014

Texas Department of Transportation

CENTRAL TEXAS
Regional Mobility Authority

DRAFT

PUBLIC HEARING SUMMARY

A Public Hearing was held by the Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (Mobility Authority) on July 29, 2014, to gather input regarding State Highway 45 Southwest (SH 45SW). The purpose of the hearing was to give the community an opportunity to share thoughts on the preferred alternative and its potential environmental impacts, as detailed in the Draft Environmental Impact Statement (Draft EIS). The Draft EIS was available for review at the hearing and at www.sh45sw.com. The hearing was held in the Bowie High School cafeteria, 4103 Slaughter Lane, Austin, Texas. The meeting included an open house between 5-6 p.m., followed by technical presentations and a public comment period. A Virtual Open House ran concurrently with the comment period following the Public Hearing (July 29 – Aug. 13, 2014).

STUDY SUMMARY

As currently proposed, SH 45SW would consist of mobility improvements between MoPac and FM 1626 in northern Hays and southern Travis counties. The proposed facility would be a four-lane divided toll road on state-owned right-of-way with limited access and no frontage roads.

AGENCY COMMENTS

The following agencies submitted comments:

- City of Austin
- Barton Springs/Edwards Aquifer Conservation District
- Texas Parks and Wildlife Department
- Travis County
- U.S. Fish and Wildlife Service

The following table includes agency comments and responses. Copies of the original comments have been included as **Attachment A** of this report.

Public comments are covered in a separate report entitled “Public Hearing Summary.”

AGENCY COMMENT AND RESPONSE REPORT

Organization	Verbatim Comment	Response
BSEACD - alignment	The District further recommends consideration of adjustments to alignment and other design elements that will protect the sensitive features and minimize the impacts to catchment areas and the quantity of interrupted recharge. Examples of other design elements that have proven successful on other projects in the area include: grade separation and the use of curb and gutters and culverts to convey stormwater to BMPs or off the recharge zone.	Protection of all sensitive karst features was the primary focus when re-aligning the roadway. In addition, roadway cross section elements such as cross slope and the use of traffic barriers to catch sediment laden runoff have been incorporated as suggested. Retaining walls have been incorporated in many areas to limit the roadway footprint near sensitive features. Especially near Flint Ridge Cave, the roadway runoff is captured in storm sewer and conveyed to water quality ponds as suggested.
BSEACD - BMPs	The District would like for the project to commit to the highest level of protection practicable using the latest technology and methods for BMPs. To this end, the District agrees to continue ongoing discussions to achieve this goal.	TxDOT is committed to providing the best available stormwater control measures and other practical best management practices that would be applicable to the project. The Barton Springs/Edwards Aquifer Conservation District would continue to have input during all phases of the project including construction.
BSEACD - Consent Decree	In addition to our statutory mandate, the Consent Decree (Decree) between the District and TxDOT signed on January 23, 1990 by Judge Walter Smith of the U.S. District Court served as a general frame of reference for our review of the DEIS. We view the court-ordered Decree as the guiding document assuring the District's role in this project and TxDOT's responsibility for designing and building the roadway to the highest level of environmental protection possible.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. TxDOT has been in communication with the Barton Springs/Edwards Aquifer Conservation District at various stages of development of the Environmental Impact Statement, and Barton Springs/Edwards Aquifer Conservation District has participated in the SH 45SW technical workgroup. TxDOT intends to continue to work with the Barton Springs/Edwards Aquifer Conservation District, even after the Environmental Impact Statement is complete, to ensure that SH 45SW is fully protective of water quality in the Edwards Aquifer and Barton Springs.

Organization	Verbatim Comment	Response
BSEACD - Consent Decree	Because of the District's commitment to seeing that the objectives of the Decree are fully implemented in the project, the District intends to be involved throughout all stages of the project and will provide comments to TxDOT as needed until project completion. To this end, the District requests TxDOT's cooperation in securing, in TxDOT's development agreement with the Central Texas Regional Mobility Authority (CTRMA), a commitment from the CTRMA to honor the applicable provisions of the Decree that involve the CTRMA's designated role in the project.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. TxDOT has been in communication with the Barton Springs/Edwards Aquifer Conservation District at various stages of development of the Environmental Impact Statement, and Barton Springs/Edwards Aquifer Conservation District has participated in the SH 45SW technical workgroup. TxDOT intends to continue to work with the Barton Springs/Edwards Aquifer Conservation District, even after the Environmental Impact Statement is complete, to ensure that SH 45SW is fully protective of water quality in the Edwards Aquifer and Barton Springs.
BSEACD - Env. Compliance Management Plan	The Environmental Compliance Management Plan describing BMP maintenance commitments is referenced in the DEIS, but was not available for review. The District requests an opportunity to review the maintenance plans when available, particularly as it describes commitments to maintenance of the PFC materials.	The Environmental Compliance Management Plan will be developed as part of the construction plans and will be available for review once available.
BSEACD - Env. Compliance Manager	The District supports the inclusion of an Environmental Compliance Manager for the construction phase of the project as suggested by the Technical Working Group.	As stated in Appendix H - Final Water Quality and Aquatic Resource Protection Technical Report, "an Environmental Compliance Manager would be on site full-time during construction to oversee construction activities and coordinate responses to environmental incidents including those related to water quality. The Environmental Compliance Manager would be a third party not employed directly by the construction firm and would not be subject to removal without TxDOT/Central Texas Regional Mobility Authority concurrence."
BSEACD - FRC	If the karst features southwest of Flint Ridge Cave (Holes #2619, 2600, 2734, and 2603) are determined to be not sensitive, we request that TxDOT consider moving the roadway alignment further away from the Flint Ridge drainage basin.	The potential karst features southwest of Flint Ridge Cave (Holes #2619, 2600, 2734, and 2603) were determined to be non-sensitive. This assessment is included in the Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas. Based on these findings, TxDOT has adjusted the schematic to reduce potential impacts to the surface drainage basin of Flint Ridge Cave. The proposed roadway alignment was moved to the south away from the opening of the cave, resulting in a decrease in anticipated impacted area of the surface drainage basin of the cave from 5.6 acres to 0.7 acre. The updated schematic and best management practices have been designed so that compensating drainage areas outside the original surface drainage basin would be used to divert flow to this sensitive

Organization	Verbatim Comment	Response
		feature so that the amount of water flowing to this feature would be maintained; therefore, no loss of recharge is anticipated. The updated schematic is provided in the Final Environmental Impact Statement.
BSEACD - general	In the subsection Land Use under Section ES.5, of the executive summary, there is a statement that cites the District as concluding that there is limited influence on the amount and pace of development of the project. The District has not analyzed this factor or come to this conclusion. Please remove any such reference to the District.	This sentence refers to responses received on the indirect and cumulative effects questionnaire sent out in November 2013. The sentence has been reworded to make this more clear.
BSEACD - general	The District intends to provide additional comment once the GA report is available and then again when the final EIS is complete. The District will evaluate the designation of significant karst features and their spatial relationship to the highway alignment and BMPs.	Comment noted.
BSEACD - general	We appreciate TxDOT's willingness to work with Participating Agencies over the past two years. We recognize the amount of resources, time, and expertise TxDOT and the Participating Agencies have committed to assure the safety of travelers as well as the delicate resource of the Edwards Aquifer.	Comment noted.
BSEACD - general	Due to the timing of this document and significant data not yet available we are providing our comments in a general nature and will provide detailed analysis ongoing as additional information is made available.	Comment noted.
BSEACD - general	We request to be added to the list of agencies to be notified by the void discovery protocols.	The Barton Springs/Edwards Aquifer Conservation District would continue to have input during all phases of the project including construction.
BSEACD - general	The District recognizes that the plans and the proposed BMPs in the DEIS are schematics that may be subject to change. The District reserves the opportunity to provide a detailed review of the final BMPs and stormwater treatment techniques at the opportune time.	The final best management practices and stormwater treatment techniques will be available for review once available.
BSEACD - Geological Assessment	Based on site visits by District staff, it is clear that the field activities, that are part of the Geological Assessment (GA), go beyond the earlier assessments that have been conducted. Of the hundreds of potential karst features within the highway right-of-way, excavations have made it possible to better assess the sensitivity of each feature. The final GA should incorporate this assessment and provide detailed explanations for why each of the identified potential karst features are considered to be either sensitive or not sensitive.	The latest assessment information is incorporated into the Geologic Assessment. Detailed descriptions of each karst feature are provided in the Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas.

Organization	Verbatim Comment	Response
BSEACD - hazardous materials	The current DEIS references the intent to allow short-term onsite storage of hazardous materials in the project area and within the 100-year floodplain. The District strongly recommends that any equipment fueling or hazardous material storage, even if short-term, should be offsite and off the recharge zone.	Storage of hazardous materials will be allowed in the Recharge Zone, but only in secondary containment areas. Best management practices associated with hazardous materials and refueling sites are described in Appendix H. Further Hazardous Materials Management protocols would be finalized during later phases of project development. Impervious liners at storage and refueling sites have been considered and will be considered further as a secondary containment measure.
BSEACD - monitor wells	To provide for pre-construction and post-construction monitoring of aquifer conditions in the vicinity of the roadway, TxDOT should install five monitor wells. Two of these would be the southwest of the roadway to provide for monitoring of up-gradient groundwater quality. Three monitor wells would be installed northeast of the roadway to provide for down-gradient monitoring of groundwater quality. The District would consider long-term monitoring responsibilities of these wells.	TxDOT has no plans to install monitoring wells within the state-owned right-of-way. However, there are nearby monitor wells southwest and northeast of the project that are not owned by TxDOT that could be utilized for this purpose. The BSEACD's consideration of long-term monitoring is noted.
BSEACD - post-construction monitoring for TSS and BMPs	The District further recommends: 1) continued monitoring post-construction to measure the effectiveness of the stormwater BMPs in achieving the 90% TSS removal standard and removing dissolved constituents and 2) commitments to mitigation should the BMPs not provide long-term average removal rates as designed.	Recharge Zone water quality controls will be designed, constructed, operated and maintained to ensure that at least 90 percent of the incremental increase in the annual mass loading of total suspended solids caused by the project is removed.
BSEACD - TSS	The baseline Total Suspended Solids (TSS) used to measure the 90% removal should be determined using the lesser of the 80 mg/L standard and the actual background TSS levels measured at the site.	Recharge Zone water quality controls will be designed, constructed, operated and maintained to ensure that at least 90 percent of the incremental increase in the annul mass loading of total suspended solids caused by the project is removed. The required total suspended solids removal must be calculated according to Texas Commission on Environmental Quality guidance, and the background value of total suspended solids concentration is provided in guidance published by the Texas Commission on Environmental Quality.

Organization	Verbatim Comment	Response
BSEACD (p. 2) - Consent Decree	The Decree is not mentioned in the DEIS. Since the Decree commits TxDOT to constructing SH 45 SW to the highest level of environmental protection practicable, we request references to these commitments in the Executive Summary, in Section 1.2, Project History, Appendix H and other pertinent sections of the DEIS. Such references will affirm TxDOT's intent to uphold the agreed intent of the Decree and continue to provide opportunities for the District to offer meaningful input on the project.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. Reference to these commitments can be found in Section 6.0 of the Final EIS.
BSEACD (p. 2-3) - wells	District records indicate that there are 150 wells in the area of influence. A map showing the locations of these wells is attached to this letter. These data can be provided by the District upon request. Further review of potential impact to the Edwards Aquifer should be conducted with consideration of this updated data set.	The well data in the Draft EIS is from the Texas Water Development Board. TxDOT has received additional well data from the Barton Springs Edwards Aquifer Conservation District and incorporated the findings into the Final EIS.
BSEACD (p. 3-4) - BMPs	The proposed use of permeable friction course (PFC) is a good option for BMPs that will provide a high level of environmental protection when used in conjunction with other BMPs. PFC can be a very effective BMP provided that there is adequate, long-term maintenance of the material.	Comment noted.

Organization	Verbatim Comment	Response
City of Austin	As discussed in the July 23, 2014 letter from Austin City Manager Marc Ott, the City finds that the DEIS does not adequately demonstrate that impacts to the natural and human environment will not be significant. There are ongoing environmental studies, including TxDOT's own karst survey, that are likely to provide information critical to a thorough assessment of the environmental impacts of the proposed project. The DEIS falls short in its consideration of project alternatives, in the transportation analysis, in the evaluation of the effectiveness of temporary and permanent water quality controls, and in its assessment of potential impacts to endangered species, sensitive karst features, groundwater, and surface water.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to the point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
City of Austin	Of particular concern to the City is protection of Flint Ridge Cave, a cave protected under Austin and Travis County's federal Balcones Canyonlands Conservation Plan permit (BCCP). Because Flint Ridge Cave is designated in the BCCP as mitigation for development activity in large areas of western Travis County, the level of protection necessary is higher than other similar, but not protected, karst features. The DEIS does not currently demonstrate how the project will achieve that level of protection.	Roadway alignment has been shifted to minimize impacts to Flint Ridge Cave. Additional protective measures would be developed in later phases of the project and included in the Water Pollution Abatement Plan, Stormwater Pollution Prevention Plan, Environmental Compliance Management Plan, etc. A technical report, Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, has been completed and was appended to the Final EIS. The conclusion of the report is that the ecological integrity of Flint Ridge Cave will not be impacted by the project. Further discussion of proposed protections for Flint Ridge Cave are provided in the Biological Evaluation report, the report titled Ecological Integrity of Flint Ridge Cave, and the SH 45SW Karst Survey Report. These reports are included as attachments to the Final EIS.
City of Austin	In meetings with TxDOT and the Central Texas Regional Mobility Authority (CTRMA) there have been discussions about incorporation of water quality controls to achieve a non-degradation water quality standard equivalent to that required for new development in this area. The water quality controls and standards described in the DEIS will not achieve that level of water quality protection. The City would like TxDOT and CTRMA to consider adoption of water quality treatment standards that meet the community's standard-of-practice for non-degradation.	The project will comply with applicable regulatory standards and will exceed those standards in many instances.

Organization	Verbatim Comment	Response
City of Austin	Technical and management staff representing three City departments (Transportation, Water, and Watershed Protection) have thoroughly reviewed the DEIS and are of the general opinion that it falls well short of the City's stated expectations that there be an objective, balanced, and thorough review of the potential environmental impacts of the project based on the best available scientific information and engineering analysis. Overall, the City believes the DEIS is fundamentally flawed, and that some of the flaws are the result of deficiencies in process while many others are of a technical nature. Accordingly, in a letter from the City Manager to TxDOT dated July 23, 2014, the City formally requested that the DEIS be withdrawn and reissued only when its many significant flaws and deficiencies have been adequately addressed.	Comment noted.
City of Austin	The environmental review was to have been conducted under the Federal NEPA, but actions were taken to shift allocated Federal funding out of the budget to enable the environmental review to proceed under State regulations. This was done with the publicly stated objective of expediting the environmental review process. Also, during the course of the environmental review process project funding agreements have been executed with Travis and Hays counties and the presumed implementing agency, the Central Texas Regional Mobility Authority (CTRMA), has initiated a procurement process for engineering design services well in advance of the draft EIS, which could limit the ability of the chosen design engineer to incorporate the requirements of the EIS.	Comment noted. All commitments made in the Environmental Impact Statement will be satisfied in subsequent phases of the project, including design and construction.
City of Austin	While there has been a "participating agency" process that has included the City of Austin and other governmental entities, it has not been as robust as might have been expected for a project with such a long history of controversy and with very well-known concerns about the environmental sensitivity of the project area. The Technical Working Group and its subgroups on karst and water quality protection have not met frequently or long enough to fully delve into these complex issues in a fully collaborative manner. For example, the TxDOT and City of Austin personnel were to have collaborated closely to refresh an engineering analysis of stormwater treatment strategies previously conducted. This collaboration did not occur. Also, City staff has repeatedly suggested that a single technical working group be established to address common issues of concern about other potential TxDOT/CTRMA roadway projects that are within the Barton Springs Zone (BSZ) of the Edwards Aquifer (i.e., the Oakhill	The City of Austin was afforded the same opportunity as other participating agencies to participate and comment during the environmental review process associated with the preparation of the Environmental Impact Statement for the SH 45SW project. The "participating agency" process is in accordance with 43 TAC §2.12, 2.84, and §2.103 in order to obtain agency input in the review process. Participating Agency status does not indicate project support and does not provide an agency with increased oversight or approval authority beyond its statutory limits. Please refer to Section 7.0, Comments and Coordination and Appendix K for documentation of participating agency coordination and participation.

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	Parkway and potential expansion of South MoPac including the intersections at Slaughter Lane and La Crosse Avenue).	
City of Austin	On several occasions in Technical Work Group meetings and other forums, City staff has suggested that the environmental review of the proposed SH45 SW be looked at in a broader regional context. Specifically, the City has concerns about the potential cumulative impacts of the aforementioned major roadway projects on the quality of water recharging the BSZ, in the aquifer, and at Barton Springs. This suggestion was not addressed in the DEIS.	In the Indirect Impacts Technical Report, the area of influence for the SH 45SW Draft EIS is an area greater than 40,000 acres. The cumulative impacts analysis Resource Study Areas for Barton Springs/Austin Blind Salamander and Groundwater, and the Combined Resource Study Area for past and future land development projects identification include both the MoPac and US 290/Oak Hill Parkway projects. The detailed Geographic Information Systems impervious cover analysis tracking change in impervious cover from 1970 to 1990 and 2012 includes these project areas and other development projects that have occurred in the Groundwater Resource Study Area, which is more than 180,000 total acres. Both the area of influence and the Resource Study Areas are sized to accommodate consideration of regional impacts in the context of the study for this four-mile long project. The various land use and transportation planning documents and maps relevant to the cumulative impacts analysis are included in the Cumulative Impacts Technical Report for the purpose of recognizing that this project takes place within a larger context in terms of resources, transportation and infrastructure planning, and regulatory frameworks.
City of Austin	On May 15, 2014 the Austin City Council adopted a resolution (CR20140515-022) which acknowledges the conflict between the IACP and "…confirms its serious concern about the proposed SH45 SW toll road based on currently available information". The DEIS should disclose and acknowledge that SH45 SW is in conflict with Austin's comprehensive plan and because most of the road is within Austin's jurisdiction the DEIS should consider how SH45, if built, could address the goals of the IACP.	The Draft EIS acknowledged that the proposed project was removed from the Imagine Austin plan (see Land Use, Local Plans and Policies section). The SH 45SW project is consistent with the plan developed by the entity responsible for transportation planning in the region – CAMPO. Inconsistencies between the Imagine Austin Comprehensive Plan and the CAMPO plan should be addressed at the regional planning level.

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City of Austin	As described in the DEIS, the purpose and need for the project appears to be based solely on projected future travel delays and does not give adequate consideration to the need to increase the capacity of the larger roadway network in the area. In the DEIS the "need" or justification for the project is based on the results of modeling that "…indicate that travel times along existing routes in northern Hays and southern Travis Counties in 2035 are projected to be nearly 80 percent longer on average than observed travel times in 2014." The DEIS goes on to conclude that the construction of the preferred alternative will reduce travel times on non-tolled roadways by approximately 23 to 28 percent. Contrary to the implications of the DEIS, commuters passing through and residents of the area will not experience relief from future congestion. In fact, modeling indicates that under the preferred alternative, projected travel times along non-tolled roadways are reduced approximately 25 percent below those projected without the tollway. This is still an increase of roughly 60 percent by 2035 rather than the 80 percent increase with the road project. A 60% increase in travel time is a significant increase and raises the question as to whether the preferred alternative is a wise investment in terms of its financial and environmental costs versus projected mobility benefits and whether there are other alternatives with the potential to achieve equal or greater mobility benefits with less cost and/or risk of irreversible environmental impact.	The purpose and need of the project as described in Section 1.0 is "to improve system connectivity, local mobility, and travel times, and to provide an efficient alternative route to congested local roadways…" Although the rest of the comment is somewhat unclear in its intent, it seems to suggest that there will be a 20 percent reduction in travel times in 2035 and then contends that the expense of the project for a 20 percent reduction in travel is unwise. However, the project also seeks "to improve system connectivity" and "to provide an efficient alternative route to congested local roadways" both of which would be accomplished by construction of the preferred alternative. Thus, travel time reductions should be considered as part of the larger purpose of the project and the "modeling" referred to in the comment seems to support the conclusion of the Draft EIS that the project would serve its purpose.
City of Austin	Of the preliminary roadway construction alternatives considered, aside from the "Upgrade Existing Roadways" preliminary alternative, the remaining two are tollways either on a new location or the existing state-owned right-of-way. This improperly slants the analysis in favor of the preferred alternative as the ROW already exists.	The analysis of preliminary alternatives was based on each alternative's ability to meet the purpose and need as well as its impacts to the human and natural environments. The state's ownership of the right-of-way purchased by Travis and Hays Counties was a factor in the evaluation only insofar as it affected the alternative's impacts to the environment compared to other build alternatives.
City of Austin	To meet stated purpose and need, the DEIS "Upgrade Existing Roadways" preliminary alternative identified a four lane highway with frontage roads and a 300-foot ROW. Frontage roads are necessary because the adjacent land along existing roadways is already developed. Expansions to Brodie Lane, Slaughter Lane, and Manchaca Road were eliminated as alternatives because the potential impact of a four lane highway with frontage roads will have 167 total relocations/displacements (Brodie/Slaughter) or 225 total relocations/displacements (Manchaca-FM2304/Slaughter). Although the DEIS states "residential and commercial relocations could potentially be reduced…it would not	Although residential and commercial relocations could potentially be reduced by shifting the roadway to avoid existing homes and businesses, the potential reductions would be minimal due to the proximity of homes and businesses to these existing roadways and the highly developed character of the land along the roadways. Even a modified alignment would result in relocations and displacements similar to those listed in Table 2.2-1. (See Section 2.2.3 and Table 2.2-1 in the Final EIS). This analysis is supported by the independent study of alternatives conducted by city of Austin staff, which included an analysis of constructing roundabouts on Brodie Lane. They concluded that "Brodie Lane roundabouts have not been pursued for further development as they are not a viable alternative to SH 45SW." They also evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including

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	be possible to totally eliminate all relocations….this alternative is not considered reasonable and was eliminated from further consideration." (DEIS, p. 18). With reduced ROW, displacements could be reduced but to what extent remains unknown as it was eliminated from further consideration.	sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonlands Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
City of Austin	The potential to maximize existing roadways as urban arterials should have, but was not, fully considered. While cost is a major consideration in any improvements within the existing roadway corridors, 3-, 4-, or even 5-lane cross sections with signalized intersections or non-signalized continuous flow intersections could be viable and might provide relief to congestions and alter travel times similar to what might be accomplished by the current preferred alternative.	The cross section analyzed in the Draft EIS under the Upgrade Existing Roadways Alternative would meet the purpose and need of the proposed project. In a study of alternatives undertaken by City of Austin staff at the request of City Council, staff concluded that improvements to existing roadways (including 1. widening Brodie Lane from Slaughter to FM 1626 and FM 1626 from I-35 to Brodie to a major, divided roadways with 4 lanes and constructing a grade separated intersection at Slaughter & Brodie, and 2. widening Manchaca Road from Slaughter to FM 1626 to a major divided roadway with 6 lanes and FM 1626 from I-35 to Manchaca Road to a major divided roadway with 4 lanes and constructing a grade separated intersection at Slaughter & Manchaca) also come with environmental constraints, "including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land...and Balcones Canyonland Preserves...as well as the Edwards Aquifer Recharge and Contributing Zones. In addition, the Brodie Lane route traverses through an established neighborhood, and improvements to widen the roadway would result in displacements to these homes. The Manchaca Road route, at least, would not pass through as much environmentally sensitive areas, however would result in residential and commercial displacements" (City of Austin, 2014)
City of Austin	The DEIS did not provide sufficient technical analysis of the alternative to demonstrate an ability to satisfy the stated purpose and need.	Section 2.2.5 provides an explanation of how the preferred alternative meets the purpose and need. This is bolstered by the analysis in Section 3.2.2 showing the preferred alternative's impacts on local mobility and travel times.
City of Austin	The DEIS fails to consider the individual or collective costs, benefits, and impacts of an "arterial solution" involving additional multiple routes (e.g., Brodie Lane, Manchaca Road, South 1st Street, FM 1626).	The analysis in the Draft EIS is supported by the independent study of alternatives conducted by City of Austin staff, which included an analysis of constructing roundabouts on Brodie Lane. They concluded that "Brodie Lane roundabouts have not been pursued for further development as they are not a viable alternative to SH 45SW." They also evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
City of Austin	The DEIS fails to adequately consider and evaluate the potential to improve mobility through the implementation of Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies, both individually and in combination with the potential improvements described generally above.	Sections 2.2.1 and 2.2.2 of the Draft EIS state that although neither alternative (Transportation System Management or Traffic Demand Management) would meet the purpose and need on its own, they could be implemented in conjunction with any of the build alternatives, including the preferred alternative.

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City of Austin	Independent Utility and Cumulative Impacts: Because of the determination that the preferred alternative has independent utility, the scope of the environmental review has been limited to the defined study area. As previously noted, the study area should be expanded to include the extent of the existing arterials and other roadways that were included in travel time modeling. Furthermore, potential environmental impacts of the preferred alternative cannot be fully understood in isolation but rather should be evaluated at a regional scale that includes analysis of the potential cumulative impacts of other potential roadway projects, specifically the aforementioned improvements to MoPac South and the Oak Hill Parkway. All of these projects overlie the BSZ and all have the potential to increase water pollutant loads and degrade the quality of water entering into, withdrawn from, and discharged from the Barton Springs Segment of the Edwards Aquifer. The proposed roadway only serves to deliver traffic from FM 1626 to South MoPac, neither of which are dense residential or commercial nodes. Thus it is clear that SH45 is not independent, but simply a segment of a larger state road network As such, the City believes these to be connected and/or cumulative actions as defined by 40 CFR Section 1508.25(a) and that a programmatic EIS should be conducted under the Federal NEPA process.	SH 45SW Draft EIS, MoPac South EA, and US 290 (Oak Hill Parkway) Environmental Impact Statement are all projects undergoing environmental impact analysis. All three of these projects are being coordinated with regard to approach for Indirect and Cumulative Impacts analysis to ensure the projects are considered collectively as well as individually. The area of influence for the SH 45SW Draft EIS includes the intersection of SH 45SW and MoPac and is an area greater than 40,000 acres. The cumulative impacts analysis Resource Study Areas for Barton Springs/Austin Blind Salamander and Groundwater, and the Combined Resource Study Area for past and future land development projects identification include both the MoPac and US 290/Oak Hill Parkway projects. The detailed Geographic Information Systems impervious cover analysis tracking change in impervious cover from 1970 to 1990 and 2012 includes these project areas and other development projects that have occurred in the Groundwater Resource Study Area, which is more than 180,000 total acres. Both the area of influence and the Resource Study Areas are sized to accommodate consideration of regional impacts in the context of the State Environmental Impact Statement study for this roughly four-mile long project. The various land use and transportation planning documents and maps relevant to the cumulative impacts analysis are included in the Cumulative Impacts Technical Report for the purpose of recognizing that this project takes place within a larger context in terms of resources, transportation and infrastructure planning, and regulatory frameworks. SH 45SW would provide a connection between two regional facilities (FM 1626 and MoPac). Currently, commuters traveling between these roadways in southern Travis/northern Hays counties must travel on congested local arterials. SH 45SW would provide travelers, including emergency vehicles, an alternative route to these congested local roadways. SH 45SW is a key link to the transportation network in southern Travis/northern Hays counties that would function independently regardless of whether the MoPac and US 290/Oak Hill Parkway projects are constructed. The proposed SH 45SW has independent utility consistent with past precedent and comparable federal definition.
City of Austin	1. Impacts to Sensitive Karst Features: It is well-established that the density of major karst recharge features (caves and large sinkholes) in and near the SH45 SW right-of-way are among the highest densities found in the Edwards Aquifer Recharge Zone. It is also well-established scientifically that a significant portion of recharge occurs in upland areas in a diffuse manner, in addition to concentrated recharge at observable karst features. Accordingly, the City has serious concerns about the potential adverse impacts of the preferred alternative on known karst features, on subsurface features that do not have expression on the land surface, and on diffuse recharge in areas altered by the project. 2. The City appreciates the significant additional field work that has and is being performed by TxDOT toidentify and characterize karst features within the right-of-way. However, as previously noted, the DEIS should not have been released prior to the	1. Karst investigations have been performed in the state-owned right-of-way in 2007 and 2014 to identify sensitive karst features, and the proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of these sensitive karst features. The surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features. Regarding the potential for adverse impacts to subsurface features that do not have expression on the land surface and on diffuse recharge in areas altered by the project, all stormwater runoff from the proposed roadway would be treated by water quality best management practices prior to release. While some water may be diverted from recharging in subsurface features or upland areas, water would be released (following treatment) and would be able to recharge to the aquifer. In addition, it is expected that very little water reaches the aquifer via direct percolation through the ground within the state-

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	completion of all geological investigations, including particularly the completion of the City's current investigation to determine the extent of the subsurface drainage basin to Flint Ridge Cave, which is discussed below. 3. The Balcones Canyonlands Preserve system (BCP) was established by the City of Austin and Travis County to protect various rare, threatened, and endangered species. As partners in the BCP, the City and Travis County jointly hold an 'incidental take" permit under the federal Endangered Species Act. By providing species protection on preserve lands, private land development and public infrastructuredevelopment in other areas of Travis County is possible without site-specific mitigation and individual incidental take permits. 4. One of the sinkhole basins that the SH45 right-of-way traverses is the 50-acre catchment area for Flint Ridge Cave. The SH 45 SW ROW passes within 150 feet of the cave entrance and passes over portions of the known subsurface extent of the cave (see attached map of Flint Ridge surface catchment). The cave provides habitat for rare troglobitic karst invertebrates including Circurina bandida and Rhadineaustinica, both of which are listed as species of concern (SOC) under the Balcones Canyonlands Conservation Plan (BCCP) permit. Potentially other SOC have been observed in Flint Ridge Cave during faunal surveys, including Eidmannella reclusa and Speodesmus N. S., although further biological investigation is necessary to distinguish the specific species present in the cave. Because of the presence of these species, Flint Ridge Cave is one of 62 caves that are protected under the BCCP permit. If the BCP is unable to protect these species then future listing as endangered or threatened species by the U.S. Fish and Wildlife Service (USFWS) is a possibility. Importantly, the City and Travis County could also incur fines or other expenses for failure to comply with the BCP permit with a likely scenario being thatthe permit will require amendment, which, in addition to being a potentially lengthy and costly process, could have implications for private land development and public infrastructure development in a large area of western Travis County. 5. Until recently the proposed SH45 SW was not obligated to comply with the BCCP permit or the federal Endangered Species Act. This is because the species in Flint Ridge Cave are not currently listed by the federal government as endangered or threatened. However, as noted previously, TravisCounty, Hays County, and Central Texas	owned right-of-way owing to the comparatively thick covering of clayey terra rossa soils. More information is available in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report. 2. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. 3. Comment noted. 4. No direct impacts to the opening of Flint Ridge Cave would occur as a result of the proposed project. TxDOT has adjusted the proposed alignment to minimize impacts to the Flint Ridge Cave surface drainage basin. The revised alignment would impact 0.7 acre of the surface drainage basin. Drainage to the cave would be maintained by re-routing an equivalent acreage of natural runoff into the cave's surface drainage area. TxDOT has evaluated the potential effect of construction and use of SH 45SW on the ecological integrity of Flint Ridge Cave, including cave fauna and associated habitat. Based on site characteristics and proposed avoidance and minimization measures, the ecological integrity of Flint Ridge Cave is likely to be maintained. Further information is provided in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. 5. TxDOT is not aware of any reason why participation in the Balcones Canyonlands Conservation Plan is required; however, TxDOT is exploring the possibility of participating in the Balcones Canyonlands Conservation Plan program for conservation measures. 6. Comment noted. The design team continues to compile relevant scientific studies to better inform the design process. Should studies become available, they would be given the appropriate consideration. TxDOT is aware of the City of Austin study of the subsurface drainage area of Flint Ridge Cave. Given the drought conditions of the past several years and the forecast for the drought to continue it is unlikely that the study will be complete in time to be considered in the design of the roadway. The realignment of the roadway and the best

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	Regional Mobility Authority have entered into an agreement to jointly fund the proposed project. Because of this funding agreement, in combination with a 1996 agreement between Travis County and the City to create the BCCP, the proposed project appears to now be a County project that must comply with BCCP permit. 6. Prior to the initiation of the environmental review process for the proposed SH45 SW the City strongly suggested that TxDOT undertake or agree to participate in a study to better delineate the subsurface drainage area of Flint Ridge Cave. As the study was not included in the scope of work for the environmental review, in early 2014 the City decided to undertake the study on its own, which is being conducted by City personnel with specific expertise in this type of analysis. The study involves the use of dye tracers to map subsurface flow patterns in the vicinity of the cave. The City's primary interest in conducting the study is to ensure that both the City and Travis County remain fully compliant with the terms and conditions of the BCCP permit. The information to be obtained through the study, in combination with available information about surface drainage patterns, is considered essential to understanding the potential risks posed by implementation of the preferred alternative and it is essential to the identification of strategies to avoid, minimize, and/or mitigate potential adverse impacts from roadway construction and operation. While the DEIS proposes design concepts for the preferred alternative to avoid and minimize impacts to Flint Ridge Cave, the City cannot determine whether those concepts will be sufficient to achieve the very high level of protection that is required for a cave listed in the BCCP permit. 7. It is the City's position, therefore, is that a final EIS and record of decision should be delayed until this information is available and is fully considered and incorporated into the EIS. This should include development of more detailed engineering designs of the proposed impact avoidance measures that are described conceptually in the DEIS.	management practices proposed for the project, which would remove at least 90 percent of the incremental increase in Total Suspended Solids (TSS) load generated by the proposed project over the Recharge Zone, would provide sufficient protection to Flint Ridge Cave regardless of the findings of the City of Austin's study. 7. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.

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City of Austin	Potential Impacts to the Barton Springs Segment of the Edwards Aquifer: The City of Austin has previously expressed and continues to have serious concerns about the potential adverse impacts of the preferred alternative on the quantity and quality of recharge to the Barton Springs Segment of the Edwards Aquifer, and to nearby users of water supply from the aquifer and to endangered species at Barton Springs. While these concerns, which are further described below, are discussed in the DEIS, the City does not believe that the analyses represented in the DEIS are sufficient to support the finding that the preferred alternative can be implemented with minimal impact to the natural environment and with no impact to federally list endangered species. As previously noted, any such determination should be withheld until all geological field investigations are completed, particularly the aforementioned study to determine the subsurface drainage area of Flint Ridge Cave. And more specifically, it is premature to conclude that the proposed "avoidance" measures described in the DEIS can be adequately evaluated and properly designed before the completion of the Flint Ridge Cave study and without quantification of the overall loss of aquifer recharge from implementation of the preferred alternative or without quantification of the pollutant loads for constituents other than Total Suspended Solids (TSS). Recharge to Barton Springs - Studies have demonstrated that a high percentage of rainfall in the area of the SH45 SW right-of-way directly recharges the Edwards Aquifer. Roughly two-thirds of the 8,300 segment from MoPac South to Bear Creek cross internal sinkhole drainage basins that supply recharge to the Edwards Aquifer. There are at least fourteen identified caves within one-quarter of a mile of the proposed designated right-of-way (ROW). Additionally, the main channel of Bear Creek downstream of the SH45 SW right-of-way contains swallets (creek-channel sinkholes) that directly recharge the aquifer in the range of 10 to 20 cubic feet per second when the creek is flowing. These swallets are prone to plugging by fine-grained sediment, which reduces recharge and could be irreversible. None of this information was specifically incorporated into the DEIS; although it was provided to TxDOT during the Technical Work Group process. Proximity to Local Public and Private Water Supply Wells - The Barton Springs Zone of the Edwards Aquifer is a designated sole source aquifer under the Federal Safe Drinking Water Act. The SH45 SW right-of-way is also within the City's Drinking Water Protection Zone. There are	The Draft EIS relied upon a previous karst survey that identified 21 sensitive features. Results from the completed karst survey have revealed a smaller number of sensitive features (17). The potential for impact is actually less than described in the Draft EIS. In addition, the alignment of the roadway as depicted in the draft schematic was adjusted to further avoid the drainage basin to Flint Ridge Cave. Information regarding the project's potential impacts to Flint Ridge Cave is included in Appendix M: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW; Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas. The Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Dept. of Transportation Right of Way, Travis and Hays Counties also provides information on karst features within the state-owned right-of-way.

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	numerous public and private water supply well systems that lie down-gradient of the right-of-way. Contaminated stormwater runoff has the potential to impact drinking water supplies in portions of Shady Hollow, Copper Hills, SW Territory, and Marbridge Foundation (see attached map of well recovery from 2007 dye tracing). Of note is that the Edwards Aquifer is understood to provide little natural attenuation of contaminants, except by dilution with natural runoff sources (Hauwert, 2009). This information was not considered in determining protective measures outlined in the DEIS. Federally-Protected Endangered Species - As noted, the City of Austin holds an Incidental Take Permit from the U.S. Fish and Wildlife Service (USFWS) for the endangered Barton Springs Salamander (Eurycea sosorum) and for the recently listed Austin Blind Salamander (Eurycea waterlooensis). Dye tracer studies performed by the City in the vicinity of the SH45 SW right-of-way have demonstrated a strong hydraulic connection with Barton Springs. Four groundwater tracers injected in the vicinity of the intersection of SH45 SW and MoPac South in 2007 and initially arrived at Barton Springs within two to four days. Long-term monitoring indicates that there has been some decline in water quality in the Barton Springs Zone (Mahler et al., 2006; Herrington et al., 2010; Mahler et al., 2011). Any loss of recharge to the aquifer or degradation of water quality as a result of the proposed project would negatively impact these federally-listed endangered species. Any direct or indirect impacts to listed species or their habitat constitutes “take” under the federal Endangered Species Act, which requires authorization from the U.S. Fish and Wildlife Service.	

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City of Austin	Environmental Compliance Management Plan: The City is encouraged by the discussions presented in Appendix H (pp. H-20) of the DEIS with regard to an Environmental Compliance Management Plan (ECMP) for the proposed project. From this discussion it appears that TxDOT/CTRMA has embraced many of the elements of the City's Environmental Commissioning (EC) process for the design, construction, and start-up of Water Treatment Plant No. 4. The City's EC process for the water treatment plant was a topic of discussion in the Technical Work Group and in subsequent meetings with CTRMA staff. However, the discussion of the ECMP in Appendix H of the DEIS is lacking specificity and is missing several critically important elements including: • Acknowledgement that the ECMP is a process that will be employed throughout the design, construction, and start-up of the project that includes an environmental compliance "team" that is independent of but integrated with the design and construction team; • Acknowledgement that the environmental compliance team will possess the technical capabilities and expertise required to provide effective independent oversight; • Clearly defined environmental protection goals and measurable performance standards; • A clear process for incorporation of environmental protection measures into project design and in construction management; • Environmental monitoring during and after construction to ensure that environmental performance standards are being met; and An adaptive management process to adjust project plans when goals and standards are not being met or when unanticipated events or conditions occur. In addition to incorporation of the above elements into the discussion of the ECMP in Appendix H, the City would like to see this discussion in the body of the DEIS along with a commitment by the implementing agency (i.e., CTRMA) to develop and implement a robust environmental compliance process in collaboration with the City.	The issues mentioned in the comment are consistent with project development thus far and would be consistent with development principals moving forward.

Organization	Verbatim Comment	Response
City of Austin	Monitoring, Assessment, and Adaptive Management: If the proposed SH45 SW goes forward it is essential that there be a robust ongoing environmental monitoring, assessment, and adaptive management program with clearly defined goals for environmental protection that will ensure full protection of BCP permit caves, City of Austin Water Quality Protection Lands, and the quality of water in nearby water wells, creeks, and at Barton Springs. The purpose of environmental monitoring and assessment is to detect problems early so that adaptive management responses can be implemented in a timely manner. For example, sediment discharges from the roadway and its appurtenances, particularly during construction, may require alterations in temporary and/or permanent stormwater controls and could require periodic physical removal of accumulated sediment to restore impaired aquifer recharge volume. Similarly, hydrologic and habitat conditions in Flint Ridge Cave will need to be monitored in perpetuity to ensure that the cave is not being adversely impacted by the roadway. The need for and costs of an ongoing environmental monitoring, assessment, and adaptive management program must be addressed in the final EIS. Additionally, there should be a commitment by the implementing agency (i.e., CTRMA) that all reasonable measures will be taken to rectify any problems that are identified through monitoring and assessment, including modifications to facilities and/or alteration of roadway operations.	The construction practices will include a robust ongoing environmental monitoring, assessment, and adaptive management program with clearly defined goals for environmental protection that will ensure protection of Balcones Canyonlands Preserve permit caves, City of Austin Water Quality Protection Lands, and the quality of water in nearby water wells, creeks, and at Barton Springs. Construction protections will include erosion and sedimentation control best management practices to be detailed in a Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan. A full-time environmental compliance monitor will have authority to recommend additional or modified sediment controls during construction. Post construction, the removal of accumulated sediment is one of the multiple corrective actions available to construction inspectors and will be conducted as necessary. Water quality control measures will be monitored in accordance with TCEQ standards.

Organization	Verbatim Comment	Response
City of Austin	There is no reference to or discussion of the 1990 Consent Decree with the Barton Springs Edwards Aquifer Conservation District. The Consent Decree states that the Barton Springs/Edwards Aquifer Conservation District will have input on how SH45SW will be built, operated and maintained. There is no proposed mechanism in the DEIS to implement this requirement.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. TxDOT has been in communication with the Barton Springs/Edwards Aquifer Conservation District at various stages of development of the Environmental Impact Statement, and Barton Springs/Edwards Aquifer Conservation District has participated in the SH 45SW technical workgroup. TxDOT intends to continue to work with the Barton Springs/Edwards Aquifer Conservation District, even after the Environmental Impact Statement is complete, to ensure that SH 45SW is fully protective of water quality in the Edwards Aquifer and Barton Springs.
City of Austin	The project is acknowledged to be in an environmentally sensitive area by virtue of overlying the Edwards Aquifer, a karst aquifer system noted as being the most sensitive in the state to pollution by Texas Commission on Environmental Quality and a sole source aquifer. The karst features, which make the aquifer sensitive, included in the DEIS are from work conducted in 2007 and do not include results of the most recent efforts. Results of the most recent karst studies are to be included in the final EIS but that bypasses significant public input as REQUIRED for an EIS.	Recently completed (2014) scientific studies (geologic assessment, karst feature survey, endangered songbird surveys) were evaluated and, where appropriate, utilized to modify the proposed roadway design to avoid or minimize impacts to sensitive features, as reflected in the Biological Evaluation and the Final EIS as appropriate. The public was provided the opportunity to review and comment on the most recent karst studies, which were published on Nov. 7, 2014.
City of Austin	In the area of Flint Ridge Cave the road profiles show the road on up to 20 ft. of fill. This amount of fill raises the roadway above tree line in many places. The amount of fill should be reduced significantly by reducing proposed highway speed to reduce curvature values or elevating the multiuse path instead of the roadway. COA constructed a number of visual cross sections which indicate that the road, despite being relatively distant, will be highly visible from adjacent neighborhoods.	The roadway profile has been lowered approximately 5-12 feet north of Bear Creek. In coordination with the city of Austin and Hill Country Conservancy, the shared use path connection to the Violet Crown Trail has been relocated to the MoPac vicinity. This eliminates the need for the shared use path underpass, thus allowing the roadway profile to be lowered.
City of Austin	Will the roadway have lighting? If so how tall will the light poles be? Any lights used should be focused entirely downward to reduce light pollution.	Safety lighting would be utilized for the proposed project. Only the intersections would be lit; the rest of the roadway would remain dark. Lights may be installed along the shared use path in certain locations. This information will be added to the Visual and Aesthetic Qualities discussion in the Final EIS (Section 3.12).

Organization	Verbatim Comment	Response
City of Austin	There is a major problem with the references in the DEIS. The reference format in Section 8 makes it difficult to locate a specific reference, many examples of references that do not support the statements they follow, or the DEIS interpretation of the reference is totally incorrect.	The references in Section 8 are listed alphabetically, grouped by corresponding sections/subsections for ease. The section/subsection number are added prior to the section/subsection title in Section 8 of the Final EIS.
City of Austin	This document contains abundant usage of conditional wording which is misleading. Words like "should" and "would" should be replaced by action verbs such as "shall" and "will" so that the reader can be assured that CTRMA/TxDOT is going to do what is stated. This is necessary to determine what is a need versus a commitment.	As the project is proposed, the commitments are contingent on the project being approved for construction. Therefore, conditional language is appropriate based on the proposed nature of the project.
City of Austin	Given the MOU between TxDOT and the Texas Commission on Environmental Quality (Texas Commission on Environmental Quality) 43 TAC 2.305 it is not clear why Texas Commission on Environmental Quality was not invited to be a "coordinating agency" in the DEIS preparation. This would have given Texas Commission on Environmental Quality a chance to work more closely with TxDOT and CTRMA in preparation of the DEIS and have more of an impact on the project than simply being another "participating" agency. This would seem to be a requirement of the MOU in 2.305(b)(2)(B) since Texas Commission on Environmental Quality has "jurisdiction by law" over the project via the Edwards Aquifer Rules 30 TAC 213.	The Memorandum of Understanding between TxDOT and Texas Commission on Environmental Quality for the environmental review of transportation projects is contained in Subchapter I (sections 2.301-2.308) of Title 43 of the Texas Administrative Code. Title 43 Texas Administrative Code section 2.305(a) explains when TxDOT shall designate Texas Commission on Environmental Quality as a participating agency during the environmental review of a transportation project. In accordance with the Memorandum of Understanding, on July 2, 2013 (see Appendix K), TxDOT mailed Texas Commission on Environmental Quality a letter inviting Texas Commission on Environmental Quality to be a participating agency. The City suggests that Texas Commission on Environmental Quality should have been made a “coordinating agency,” but state regulations do not contemplate such a role. Rather, state regulations address participating agencies and coordination with those participating agencies. See 43 Texas Administrative Code § 2.305. Texas Commission on Environmental Quality was invited to participate and was afforded the same opportunity as other participating agencies to coordinate and comment during the SH 45SW Environmental Impact Statement environmental review process. These participation activities were conducted in accordance with sections 2.12 (project coordination), 2.84 (Environmental Impact Statements), 2.103 (coordination plan for Environmental Impact Statement), and 2.305 (Memorandum of Understanding coordination provision) of Title 43 Texas Administrative Code in order to obtain agency input in the review process. Please refer to Section 7.0, Comments and Coordination and Appendix K for documentation of participating agency coordination and participation.

Organization	Verbatim Comment	Response
City of Austin	Given their expertise in the subject area, jurisdiction by law and MOU with TxDOT, it is also unclear why the Texas Parks and Wildlife Department (TPWD) was not invited to be a "coordinating agency". The MOU in 43 TAC 2.206 would also seem to provide triggers for special coordination on the project with TPWD.	On July 2, 2013 (see Appendix K), TxDOT initiated coordination with Texas Parks and Wildlife Department by mailing Texas Parks and Wildlife Department a letter inviting it to be a participating agency in the SH 45SW project. Texas Parks and Wildlife Department was invited to participate and was afforded the same opportunity as other participating agencies to coordinate and comment during the SH 45SW Environmental Impact Statement environmental review process. These participation activities were conducted in accordance with sections 2.12 (project coordination), 2.84 (Environmental Impact Statements), 2.103 (coordination plan for Environmental Impact Statement), and section 2.22(d) (of the Memorandum of Understanding in place at that time between Texas Parks and Wildlife Department and TxDOT "Provisions" section) in order to obtain agency input in the review process. Although the Memorandum of Understanding in place at the time of initial coordination has since been replaced, the new MOU mandates that coordination be completed under the procedures of the prior Memorandum of Understanding because coordination was initiated before the new MOU's effective date of September 1, 2013. See 43 Texas Administrative Code 2.201(e). Thus, 43 Texas Administrative Code 2.206 did not govern the coordination procedures between TxDOT and Texas Parks and Wildlife Department for SH 45SW. The prior Memorandum of Understanding explained in section 2.22(d)(2) that coordination was to be conducted under certain circumstances, including but not limited to projects that are within the range and suitable habitat of any state or federally listed threatened or endangered species. The City suggests that Texas Parks and Wildlife Department should have been made a "coordinating agency," but the Memorandum of Understanding does not contemplate such a role. Rather, the Memorandum of Understanding in section 2.22(d)(2) provides for coordination between TxDOT and Texas Parks and Wildlife Department. Please refer to Section 7.0, Comments and Coordination and Appendix K for documentation of participating agency coordination and participation.
City of Austin	It is stated that impacts to geologic resources as a result of the Build Alternative are anticipated to be minor, but that additional karst investigations are currently underway. It is not possible to assess the potential impacts on geologic and karst resources until these investigations are completed.	Expectations of impact are based on the commitment to design the project with minimization and avoidance as principal driving influences and with mitigation as a commitment where appropriate. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final Environmental Impact Statement and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.

Organization	Verbatim Comment	Response
City of Austin	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft. contour intervals (versus 2 ft used by the TxDOT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the DEIS.	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed.
City of Austin	It is stated that 5.6 acres of Flint Ridge surface catchment will be covered by impervious surfaces but does not note how many acres of the catchment will be disturbed or diverted by the east side berm.	The proposed alignment has been shifted away from Flint Ridge Cave and the berm has been removed from consideration. Recent design changes would minimize impacts to the surface catchment basin (now estimated at 0.7 acres). The Flint Ridge Cave surface catchment has been addressed in the Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, which is appended to the Final EIS.
City of Austin	Text does not acknowledge that part of the cave underlies the ROW.	The Flint Ridge Cave footprint is acknowledged in the Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas. The footprint is also depicted on updated figures that are included in the Final EIS (Final EIS Figure 3.7-7 and Appendix H Figure 4.2-1 and in Attachment 3).
City of Austin	Direct impacts to the natural environment - do the 47.9 ac of impervious cover include the berm planned to divert polluted runoff away from Flint Ridge Cave, WQ Ponds, and the clay layer planned to be installed to prevent polluted runoff from infiltrating into Flint Ridge Cave?	Redesign of the roadway has eliminated the need for the berm. The proposed clay liners were not counted towards the impervious cover value. The clay liners would be covered with topsoil. Pond liners are not typically counted towards the amount of impervious cover.

Organization	Verbatim Comment	Response
City of Austin	Substantially is defined in TxDOT guidance for cumulative and indirect impacts. This should be in a glossary. From the TxDOT definition, this conclusion in not supported by the analysis provided. Further, surface and groundwater resources in the proposed project's AOI are not anticipated to be substantially adversely affected due to the large amount of preserved WQPLs and the implementation of BMPs. Additionally, several regulations are in place to protect water quality from the effects of induced development, including Texas Commission on Environmental Quality regulations requiring BMPs and preparation of SW3Ps, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the CWA.	According to TxDOT's Guidance on Indirect and Cumulative Impacts Analysis (2010), "The common definition of "substantial" is 'of ample or considerable amount, quantity, size, etc." Substantial impacts are those that are noteworthy. Most issues that are carried forward for further study involve substantial effects. Context and intensity play a role in determining which impacts are substantial. Substantial impacts are notable, but may not be significant. With regard to surface and groundwater resources, direct impacts from the project are limited and induced development is limited by Water Quality Protection Lands and water quality protection regulations that would apply to public and private land development by others within the Resource Study Areas. The current analysis meets the definitions in the TxDOT guidance including providing opportunities for public input and comment even though this is a state action rather than a "major federal action".
City of Austin	The report references COA ordinances and implies that these and other ordinances would protect the aquifer from future development when most of the area serviced by SH45 is outside COA jurisdiction.	Some of the area of influence is within the city of Austin jurisdiction, and some is within other jurisdictions. The sentence that references the city of Austin drainage/water quality requirements and ordinances is intended to include all pertinent regulations that apply to all or portion of the area of influence, which includes the city of Austin jurisdictional areas. Please refer to Section 4.0 for a discussion of the indirect impacts and Section 3.2 in Appendix D for a description of the area of influence.
City of Austin	How will discharge of treated runoff into Bear Creek affect overall recharge to the Barton Springs portion of the Edwards Aquifer?	Efforts to preserve recharge quantity despite the addition of increased impervious cover in the recharge zone are discussed in the Final EIS. Specifically, stormwater pulses would be detained in water quality ponds and slowly released. The slow release would increase the potential for recharge because during highflows, such as those associated with storm pulses, a smaller proportion of total flow is recharged. Therefore, delayed releases would allow for increased recharge potential.

Organization	Verbatim Comment	Response
City of Austin	Asserts that WQPL was acquired to mitigate for development that might occur because of SH45. There is no document from the City anywhere that establishes the public purpose of WQPL as mitigation for new development. Instead the public purpose is to preserve water quality and quantity by limiting limit new development over the aquifer by removing land available for development. Any new development associated with SH45 would be adverse to the purpose for WQPL.	Page ES 13 states: "...surface and groundwater resources in the proposed project's area of influence are not anticipated to be substantially adversely affected due to the large amount of preserved Water Quality Protection Lands and the implementation of best management practices. Additionally, several regulations are in place to protect water quality from the effects of induced development, including Texas Commission on Environmental Quality regulations requiring best management practices and preparation of Stormwater Pollution Prevention Plans, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the Clean Water Act." This statement does not state that the Water Quality Protection Land was acquired to mitigate for development that might occur because of SH 45. The existence of Water Quality Protection Lands which prohibit development, and regulations for best management practices where development is proposed, are both conditions that help manage potential adverse impacts to surface water and groundwater resources due to potential future development.
City of Austin	Does Last sentence of last paragraph in Water quality section imply that SH45 will be constructed to COA Water Quality standards (implied SOS)?	The project will commit to meeting the current regulatory requirements and will exceed these in several instances.
City of Austin	States there will be no direct impact to threatened and endangered species. However, ROW is within 100M of identified GCWA habitat on the Tabor and Edwards Crossing WQPL tracts. The USFWS standard of indirect effects on GCWA is development and disturbance within 100 meters of nesting birds. There may well be indirect effects to GCWA.	See Biological Evaluation report for discussion of potential indirect impacts to Golden-cheeked Warbler. Overall, it was determined that no indirect impacts to Golden-cheeked Warblers would be expected to result from presence and use of the proposed SH 45SW. The impacts to the Golden-cheeked Warbler are addressed in the State Highway 45SW: Golden-cheeked Warbler Technical Report.
City of Austin	Describes no direct effect to Austin Blind salamander, yet USFWS listing notice describes any impact to critical habitat would be considered take. Since runoff from site flows directly to Barton Springs assertions about WQ effects are questionable. There may be direct effects to ABS.	Impacts to the salamander species is addressed in the technical report Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. TxDOT's Biological Evaluation indicates there will be no impact to the Austin blind salamander or its critical habitat. The use of best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to this species would not occur. The Biological Evaluation is included as an attachment to the Final EIS.
City of Austin	Describes insignificant changes to WQ due to operations as being mitigated by potential future development in study area. USFWS listing notice does not provide for this.	Comment noted.

Organization	Verbatim Comment	Response
City of Austin	Vegetation - Does the 159 ac of vegetation impacted vegetation include areas disturbed by berms, bentonite cap, and diversion structure to Flint Ridge Cave?	No, the berm has been removed from the design and the amount of disturbed vegetation is addressed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas and in Section 3.8 of the Final EIS.
City of Austin	The No Build Alternative states that it is assumed that all other projects listed in the CAMPO 2035 RTP would be implemented. However, neither the benefits nor impacts of all of these other projects being implemented are analyzed as a part of the No Build alternative.	The intent of the analysis is to address the direct effects of the No Build Alternative as it pertains to the SH 45SW proposed project. The "no-build" alternative is always included as an alternative in order to assess the impacts of no action. Potential impacts to resources as a result of the No Build Alternative are discussed in the body of the Final EIS document by resource in Section 3.0.
City of Austin	The technical workgroup meetings were not long enough and did not occur frequently enough to enable participants to provide constructive input to reduce the environmental impact of the project.	Comment noted. Please refer to Section 7.0 for a summary of public and agency involvement.
City of Austin	The DEIS cites population growth figures for census tracts "surrounding the proposed project area" but does not specify these tracts to allow for verification. There is also a vague reference to a CAMPO forecast for the area without the necessary specificity.	The complete analysis was provided in the body of the Draft EIS. Section 3.2 and Figure 3.2-1 provide greater detail on the census geographies used for the analysis. Population forecasts are discussed in Section 1.4 and Section 3.2.
City of Austin	Based on the analysis of environmental, social, and economic impacts associated with both the Build and No Build Alternatives, the Build Alternative was identified as the Preferred Alternative for the proposed project. The evaluation of the Build and No Build Alternatives was based on the following criteria. The text goes on to provide bullet items of the criteria with no real attempt at analysis using an objective qualitative or quantitative method.	The complete analysis was provided in the body of the Draft EIS. The project justification in the Purpose and Need is provided in Section 1.0, the projects effect on the environment is provided in Section 3.0, and the project's indirect and cumulative impacts are provided in Section 4.0.
City of Austin	All alternatives except for the Build in Existing ROW and No Build were discounted. It is not adequate for an Environmental Impact Statement to only review the preferred alternative and a no build alternative.	As Title 43 Texas Administrative Code Part 1, Chapter 2, Subchapter D, Rule §2.84 states, "An Environmental Impact Statement must include...an evaluation of all reasonable alternatives satisfying the purpose and need, their associated social, economic, and environmental impact, an evaluation of alternatives eliminated from detailed study, and a determination of the preferred alternative..." All of the build alternatives were evaluated as part of the alternatives analysis; however, the preferred alternative was the only build alternative that was both reasonable and met the purpose and need. Therefore, it was the only build alternative carried forward through the Draft EIS.
City of Austin	Summary of Alternatives, Preliminary and Reasonable alternatives - discusses potential impacts to WQPL as reasoning to exclude potential alternatives. It does not discuss need to acquire land rights on WQPL for berms and additional "Flint Ridge Cave Watershed" and changes to natural surface and subsurface flows to divert un-affected flows into Flint Ridge Cave to replace diverted affected flows from the preferred alternative.	This section does not discuss the need to acquire land rights on Water Quality Protection Land because the right of way was purchased before the designation of any Water Quality Protection Land adjacent to it and all work would be done in existing right-of-way, not on Water Quality Protection Lands. Further, the design of the proposed project has been altered to further avoid impacts to Flint Ridge Cave: the berm has been removed from the design and now only water is being redirected from within the right-of-way to Flint Ridge Cave.
City of Austin	It is misleading to say that the project avoids direct impacts to WQPL since approximately 38 acres of WQPL was purchased for the ROW so WQPL has been impacted.	The right of way for SH 45SW was purchased before the Water Quality Protection Lands were purchased.

Organization	Verbatim Comment	Response
City of Austin	Preferred alternative cites impacts to preserve lands as reasoning for selecting build alternative as preferred, yet analysis does not speak to effects to preserve land for build alt.	For analysis of direct impacts and encroachment-alteration impacts to land use and preserve lands as a result of the Build Alternative, see Section 3.1. For analysis of indirect impacts, including induced growth, to land use and preserve lands as a result of the Build Alternative, see Appendix D.
City of Austin	This section states that the City of Austin et al. have stated that the road will have a limited influence on development in the area. Please provide a reference for each agency listed in which that statement is supported. 19.8% of the land in the study area may be developed in the future (see table 3.1-1). This contradicts what has occurred due to transportation projects elsewhere in the region.	This statement refers to responses to a questionnaire sent to local and regional land use planning agencies and organizations in November 2013. Information clarifying this will be included in this section in the Final EIS. The full list of respondents and their general responses are included in the Indirect Tech Report (Appendix D). The amount of developable land available in the study area was calculated using spatial information from the city of Austin, Capital Area Council of Governments, and Travis and Hays Counties. This percentage represents the amount of vacant land within the study area that lies outside the 100-year floodplain and is not protected or preserved from development. See Section 7.3.3 for results of Planning Expert Questionnaire and Responses discussion. Table 3.1-1 provides estimated quantities of land within the study area, represented on Figure 3.1-2, which is different from the area of influence or the Resource Study Areas analyzed in Indirect and Cumulative Technical Reports.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Indirect impacts associated with induced growth are not anticipated to be significant under the Build Alternative due to the limited access nature of the rate of growth already occurring in the area (even in the absence of the proposed facility).roadway, the large amount of protected lands in the proposed project's area of influence (AOI – area in which project-related impacts that are removed in time or distance from the proposed project site itself may still occur), and the high rate of growth already occurring in the area (even in the absence of the proposed facility).	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.

Organization	Verbatim Comment	Response
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. The proposed project's influence on development is not anticipated to be significant, especially given the Austin area's high rate of growth overall and within the study area.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. While induced growth can indirectly impact water quality and groundwater recharge primarily through increased impervious cover, induced growth as a result of the Build Alternative is not anticipated to be significant.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	States that direct project related impacts to land use would not occur. Yet, proposal to divert overland flow will divert runoff from one sub- watershed to another affecting not only the sub-watershed being substituted but also watersheds downslope and subsurface drainage downslope limiting their effectiveness as protected watersheds serving BSEA. The diversion facility would become a direct project related impact and development on WQPL.	Alignment, drainage, and profile design changes have been incorporated that result in no diversion of overland flow from one sub-watershed to another.
City of Austin	Insert this paragraph first - "the proposed project is in Hays and Travis counties, which is in an area in attainment or unclassifiable for all national ambient air quality standards (NAAQS), including ozone; therefore, the transportation conformity rules do not apply."	Sentence has been added into the Executive Summary of the document similar to Section 3.4 in the Draft EIS.

Organization	Verbatim Comment	Response
City of Austin	Modify this statement - "A quantitative analysis of air quality impacts resulting from the Build Alternative was not completed for this environmental impact analysis as traffic projections for the design year are 34,400 vehicles per day (vpd), well under the 140,000 vpd threshold for a Traffic Air Quality Analysis. " To read as - A quantitative analysis of air quality impacts resulting from the Build Alternative was not completed for this environmental impact analysis. Traffic projections for the design year are 34,400 vehicles per day (vpd), well under the 140,000 vpd threshold for a Carbon Monoxide (CO) Traffic Air Quality Analysis.	The current language comes from the TxDOT Air Quality Standard of Uniformity and remains unchanged.
City of Austin	Rather than stating that the VMT will be slightly higher under the Build Alternative, please provide a percentage to let the reader know how much higher the VMT is expected to be.	Modeling indicates that the vehicle miles traveled would be 15 percent higher under the Build Alternative than the No Build. This information has been incorporated into the Final EIS (Executive Summary and Section 3.4).
City of Austin	A quantitative analysis of air quality impacts was not done because the VMT was under a regulatory threshold for such an analysis. In keeping with the stated TxDOT goal of developing the most environmentally safe project given the sensitivity of the area, such analysis could have shown the superiority of the DEIS rather than business as usual. This is only an example of a common flaw in the DEIS and the inconsistency that is seen throughout the "analyses" in the document.	Comment noted. This comment is in reference to the Executive summary portion of the report. The complete analysis was provided in the body of the Draft EIS. Please refer to Section 3.4 in the Final EIS for a discussion on “Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis.” Projected traffic data for the design year 2035 is approximately 34,400 vehicles per day (vpd). A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an AADT below 140,000. The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required. Because of the limitations in the methodologies for forecasting health impacts described is Section 3.4, the results of such assessments would not be useful to decision makers, who would need to weigh uncertainties in results against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.
City of Austin	The study area should encompass more area, perhaps even as far east as Manchaca Lane (since the upgrade of Manchaca Road was considered in one of the preliminary alternatives.)	The study area was developed based on the purpose and need for the project and encompasses a large enough area to identify potential alternatives that could meet the purpose and need. Although the Upgrade of One or More Existing Roadways alternative was evaluated as one of the preliminary alternatives, it was not found to be reasonable; therefore, expanding the study area to encompass this alternative was not necessary.
City of Austin	Study area should extend to include Slaughter Lane and all of Brodie Lane south of Slaughter Lane	The study area was developed based on the purpose and need for the project and encompasses a large enough area to identify potential alternatives that could meet the purpose and need. Although the Upgrade of One or More Existing Roadways alternative was evaluated as one of the preliminary alternatives, it was not found to be reasonable; therefore, expanding the study area to encompass this alternative was not necessary.

Organization	Verbatim Comment	Response
City of Austin	Question: Will Preferred Alternative project predetermine location/type of improvements within FM 1626 corridor eastward to IH 35? If no, why not? (The extension of SH 45 SW is included in Hays County Transportation Plan.)	Proposed improvements on FM 1626 are already in the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan or are under construction and have been evaluated as having independent utility regardless of whether the proposed SH 45SW project is constructed. The environmental and engineering analysis of an extension of SH 45SW between FM 1626 and I-35 is also included in the Capital Area Metropolitan Planning Organization 2035 Plan. However, improvements extending to I-35 are not within the scope of this project; the project included in the Hays County Transportation Plan differs from the project under study in this Environmental Impact Statement.
City of Austin	Question: What impact has the purchase of project ROW and deeding to State by Hays & Travis Counties had on the selection of Preferred Alternative (New Tollway on Existing State-owned ROW Alternative)?	The state's ownership of the right-of-way purchased by Travis and Hays Counties was a factor in the selection of the preferred alternative only insofar as it affected the alternative's impacts to the environment compared to other build alternatives.
City of Austin	The purpose and need seems to be based on future travel delays and does not speak to the corridor within a system. It does not quantify the capacity needs, and does not speak to the system and how the roadways to the south are limited. FM 1626 is currently a 2 lane rural roadway, which generally could be upgraded to a 4 lane at-grade roadway. Assuming that there is not a plan to make it a freeway, and that signals will be needed at intersections along the road, the proposed SH 45 has twice the capacity of the linkage to the south. This does not include any potential operations changes to Brodie and Manchaca. If SH 45 is extended to Interstate 35, the full capacity could be used.	The proposed project is included in the Capital Area Metropolitan Planning Organization 2035 RTP, which identifies and evaluates projects within the context of the broader transportation system. FM 1626 from FM 967 to Brodie Lane is currently being widened from two to a four lane divided facility. Travis County is currently evaluating plans to widen FM 1626 from Brodie Lane to FM 2304 (Manchaca Road) to a four lane divided roadway. Section 3.2.2 of the Final EIS addresses the project's impact to travel patterns and access.
City of Austin	RTG 2014 formulas and calculations should be in Appendix	The calculations for observed travel times are included in the Final EIS Appendix N. The 2035 projected travel times are based on the Capital Area Metropolitan Planning Organization 2035 Travel Demand Model.
City of Austin	Please use compound annualized population growth rates in Paragraphs 1 & 2, not simple percentage increases, for both historic and future growth rates.	Current analysis adequately shows growth in the study area. Including compound growth rate will not change conclusion of assessment.
City of Austin	Brodie Lane is classified as a major arterial from US 290 to FM 1627	Change made as requested.

Organization	Verbatim Comment	Response
City of Austin	The Other Project Goals do not include reference to the terms of the judgment of the 1990 Consent Decree with the Barton Springs Edwards Aquifer, or discussion that the road will be consistent with the non-degradation requirement of the City of Austin Save Our Springs Ordinance. "Other Project Goals" should include "the preservation of the quality and quantity of recharge to the Edwards Aquifer."	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. The "Other Project Goals" section of the Final EIS (Section 1.5) adequately recognizes the project emphasis on water quality. No change has been made to the Final EIS.
City of Austin	The wording of the TxDOT environmental goals (Other Project-Related Goals, making it appear to be an afterthought) for the project have subtly changed from those discussed at numerous meetings on the project. Rather than a superior project and the most environmentally sensitive roadway designed, it is now to be constructed in a "environmentally sensitive manner that minimizes, to the maximum extent practicable, the potential impacts to the Edwards Aquifer from construction and operation of the roadway". It is clear that the written goals are a far cry from those in previous verbal commitments.	Comment noted.
City of Austin	Discussion of census blocks having more than 50% minority population is provided but with no direct citation of these census blocks.	Figure 3.2-2 provides the census blocks having more than 50 percent minority population and Appendix E provides minority populations by census block.
City of Austin	A general dismissal of any potentially negative impacts of the toll without any backup data or reference. The DEIS basically states that there will an annual impact of about $600 without any analysis of how this fee will affect the population of users.	Please refer to an analysis of the economic impact of tolls included in Section 3.2.2 ("Potential Economic Impact to Individuals"). This section includes Table 3.2-11 which displays the estimated annual toll cost as a percentage of median household incomes in Hays and Travis Counties and as a percentage of the poverty guideline for a family of four.
City of Austin	Discussion of census blocks having more than 50% minority population is provided but with no direct citation of these census blocks.	Figure 3.2-2 provides the census blocks having more than 50 percent minority population and Appendix E provides minority populations by census block.

Organization	Verbatim Comment	Response
City of Austin	Why wasn't a new non-tolled roadway on existing state-owned ROW a preliminary alternative?	Funding for new highways is extremely limited due to fully committed bond funds, the decreased purchasing power of highway funds, rising fuel efficiency, an aging highway system, and the uncertainty of federal funding. Legislatures and local planners have identified tolling as an option to address the mobility needs of a growing population. The Capital Area Metropolitan Planning Organization's most recent long range plan update, the 2035 Regional Transportation Plan (2010), identifies SH 45SW as a four-lane tolled freeway from MoPac to FM 1626.
City of Austin	Why didn't the "upgrade of one or more existing roadways" include a consideration of just upgraded arterials?	The analysis of the Upgrade of One or More Existing Roadways Alternative required assessing the potential upgrading of Slaughter Lane, Brodie Lane, and/or Manchaca Road to a four-lane highway with frontage roads in order that the alternative met the purpose and need (see Section 1.0 for purpose and need discussion). Other types of improvements to these roadways (roundabouts, adding additional lanes) would not meet the purpose and need.
City of Austin	State definition of "highway"; if frontage roads are included is highway assumed to be toll or non-toll? State typical total ROW required for 4-lane highway in text after "additional ROW would be required."	Added definition of "highway" and typical right-of-way required for the facility.
City of Austin	Question/Clarify in second sentence: would this alternative include frontage roads in ROW, in addition to stated main lanes and interchanges?	Due to the impacts associated with this preliminary alternative, the design was not developed to the point needed to determine if and/or where frontage roads would be needed.
City of Austin	Please identify the specific TSM strategies implemented on Brodie Lane, Manchaca Road and Slaughter Lane, and the level of mobility improvement achieved by the strategies prior to conclusion TSM Alternative cannot improve system connectivity or offer an alternative route to congested local roadways.	The Transportation System Management strategies implemented on portions of Brodie Lane, Manchaca Road and Slaughter Lane are listed in the first paragraph of Section 2.2.1: "The strategies described in Section 2.1.1 - such as optimization of signal timing, intersection improvements, and turn bays - have been implemented on portions of Brodie Lane, Manchaca Road, and Slaughter Lane, and these roadways remain congested." Information on travel times on area roadways is provided in Section 3.2.2.
City of Austin	Why is upgrading to a highway facility with frontage the only alternative? Why not arterial 4-lane or 5-lane cross section?	Upgrading local roadways to 4-lane or 5-lane arterials would not meet the purpose and need, as it would not provide an alternative route to congested local roadways or improve system connectivity and local mobility. City of Austin staff evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
City of Austin	The analysis presented removes improvements to Brodie and Manchaca as alternatives because it assumes that grade separated roadways in 300 feet of right-of-way would be needed to handle the need. It is difficult to tell if the need is met, because the need is based on delay and not on balancing system wide capacity. A simple analogy would be there is a 2 inch hose full of water coming north in the morning from Hays County, that feeds two 1 inch hoses (Brodie and Manchaca), and we are now going	Upgrading local roadways to 4-lane or 5-lane arterials would not meet the purpose and need, as it would not provide an alternative route to congested local roadways or improve system connectivity and local mobility. City of Austin staff evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014). Therefore, constraints

Organization	Verbatim Comment	Response
	to build a 4 inch hose to connect to MOPAC. It would reduce the pressure (delay) in the system, but would not increase the capacity of the system. DEIS did not look at combination of improvements to Brodie and Manchaca that could provide the needed capacity. The report just says widen either roadway to a freeway would cause too much disruption to the neighborhoods.	on improvements to existing roadways would also apply to suggested combination of improvements.
City of Austin	Please evaluate upgrade of Brodie Lane to 4-lane divided arterial with grade separated interchange at Slaughter & Brodie Lanes. Required ROW for MAD 4 is 100 - 120 feet.	Upgrading local roadways to 4-lane or 5-lane arterials would not meet the purpose and need, as it would not provide an alternative route to congested local roadways or improve system connectivity and local mobility. City of Austin staff evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…"(City of Austin, 2014).
City of Austin	The TDM Alternative discusses one TDM, transit. Please discuss TDM strategies and whether purpose and need can be met by common TDMs (bike, walk, flex schedules, mixed land use activity centers adopted in MPO Plan, alternative schedules, telecommute/tele- technologies). These approaches are mentioned on Page 15, "2.1.2 Travel Demand Management (TDM)".	The Final EIS has been updated to include information on additional Traffic Demand Management strategies, including bicyclist/pedestrian infrastructure and flex time, carpooling, etc. as part of Capital Area Metropolitan Planning Organization Commute Solutions program (Section 2.2.2).
City of Austin	Please evaluate upgrade of Manchaca Road to 4-lane divided arterial with grade separated interchange at Slaughter & Manchaca, if warranted. Required ROW for MAD 4 is 100 - 120 feet, less than 300 feet for Alternative eliminated from further consideration. (No additional Slaughter Lane ROW beyond Manchaca at Slaughter intersection/interchange. FM 2304 not in BS-EAR or BS-EAC zones.)	Upgrading local roadways to 4-lane or 5-lane arterials would not meet the purpose and need, as it would not provide an alternative route to congested local roadways or improve system connectivity and local mobility. City of Austin staff evaluated more extensive improvements to Brodie Lane and Manchaca Road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
City of Austin	Regarding the underpass for the Violet Crown Trail, will this underpass be large enough for a standard truck to pass through? Maintenance and security for the proposed trail may be hampered if this is not the case.	In a coordination meeting with the city of Austin, TxDOT, Hill Country Conservancy, and Central Texas Regional Mobility Authority it was agreed that the Violet Crown Trail would cross SH 45SW just east of MoPac instead of the underpass just west of Bear Creek.
City of Austin	Regarding the underpass for the Violet Crown Trail, this must be located much further north to avoid impacting the Flint Ridge Basin. The trail was always expected to join or cross the SH45 ROW as north as possible and then follow the ROW to where it connects to the trail continuation on the other side of the ROW.	In a coordination meeting with the city of Austin, TxDOT, Hill Country Conservancy, and Central Texas Regional Mobility Authority it was agreed that the Violet Crown Trail would cross SH 45SW just east of MoPac instead of the underpass just west of Bear Creek.

Organization	Verbatim Comment	Response
City of Austin	APPENDIX C: Safety concerns regarding shared use path (SUP) crossings of turn lanes, connectors, main lanes at intersections/interchanges at S. Loop 1, Bliss Spillar Road, FM 1626. Provide additional details on Schematics in Appendix C and evaluate bicycle, pedestrian, ADA safety at all SUP crossings of Build Alternative.	This level of detail is not shown on the schematic but will be included with the detail plans prepared during the Plan Specifications & Estimate phase. The Shared Use Path will be designed by a licensed engineer and appropriate safety measures and design will be included in the plans.
City of Austin	Why is a tolled facility the PA and not a toll free?	Funding for new highways is extremely limited due to fully-committed bond funds, the decreased purchasing power of highway funds, rising fuel efficiency, an aging highway system, and the uncertainty of federal funding. Legislatures and local planners have identified tolling as an option to address the mobility needs of a growing population. The Capital Area Metropolitan Planning Organization's most recent long range plan update, the 2035 Regional Transportation Plan (2010), identifies SH 45SW as a four-lane tolled freeway from MoPac to FM 1626.
City of Austin	Figure 2.4-1 does not depict areas outside ROW where runoff from highway will be diverted to and areas outside ROW where runoff will be diverted from to serve Flint Ridge Cave as areas of disturbance from SH45SW.	Figure 2.4-1 does not depict areas outside right-of-way because runoff from the highway would be diverted to water quality ponds and discharged to Bear Creek. Water Quality pond locations are provided in a separate figure in the Section 3.7 (Figure 3.7-6) Updated figures that include depictions of surface drainage basins (both inside and outside of the right-of-way) are included in Appendix H of the Final EIS. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas technical report Disruptions to cross-draining surface flow would be avoided to the maximum extent practicable. Furthermore, the commingling of offsite surface water and untreated roadway stormwater runoff would also be minimized. Surface water redistribution plans associated with protections for Flint Ridge Cave have been modified in response to public comment and new scientific information, resulting in a reduction of surface drainage area impacts from 5.6 acres to 0.7 acres.
City of Austin	There is no COA 2012 reference listed in Section 9	City of Austin 2012 refers to the Imagine Austin Comprehensive Plan, adopted by council in 2012. The citation listed in the references section has been updated from City of Austin 2010b to City of Austin 2012 to address this issue.
City of Austin	Mention of Census data on new residential construction within the study area without specific attribution or direct listing of these data.	This statistic was cited as (Census, 2012) and was included in reference section of the Draft EIS as: US Census (2012). "Housing Unit Estimates for the 100 Fastest Growing Counties with 5000 or more Housing Units: April 1, 2010-July 1, 2012" PEPCUMGRHU. 2012 Population Estimates.
City of Austin	Correct Fig. 3.1-1 to show Avana Full Purpose Annexation in southwest Study Area. http://austintexas.gov/department/annexation-extraterritorial-jurisdiction-planning.	The figure has been updated to show the most recent Austin jurisdictions shapefile (downloaded from city's GIS ftp site 10/2014) in Final EIS.

Organization	Verbatim Comment	Response
City of Austin	The map shows the entirety of the Grey Rock Ridge Subdivision as residential. The subdivision plan seems to set aside open space that is not shown.	Figure 3.1-2 was created using city of Austin land use and emerging projects shapefiles - these details are not reflected in those datasets. Whether the parcel is classified as entirely residential or partly open space, the amounts of vacant land and developable land are not altered.
City of Austin	The map shows a tract in Shady Oaks Estate, section 2 that is south of the neighborhood park as "Developable Land." This tract is a common area used for open space or drainage and probably not developable.	Parcel's land use designation was confirmed as undevelopable and has been changed to open space (undevelopable) in the Final EIS.
City of Austin	Table 3.1-1 shows different amounts of developable land than listed on page 41.	The amount of vacant land listed in Table 3.1-1 includes undeveloped land in the 100-year floodplain: "Undeveloped land not part of preserved land or parks (includes land within the 100-year floodplain)." The amount of vacant land cited in the 2nd paragraph on page 41 refers only to developable land (i.e. vacant land outside the 100-year floodplain): "Approximately 16.6 percent...of the study area is comprised of vacant, *developable lands outside the 100-year floodplain*..."
City of Austin	Imagine Austin, while incorporating adopted Neighborhood Plans, contains the Imagine Austin Growth Concept Map. The adopted Growth Concept does make future land use goals and recommendations; please correct third paragraph to reflect content of Concept. ftp://ftp.ci.austin.tx.us/GIS-Data/planning/maps/Fig_4.5_Growth_Concept_Map_24x36-2_Map.jpg Also, revise content of third paragraph to reference Imagine Austin Roadway Networks, Transit Networks, Bicycle & Pedestrian Networks (Figures 4.4, 4.3, 4.2 at http://www.austintexas.gov/department/our-plan-future)	Paragraph was edited as suggested. The Growth Concept Map and future roadway, transit, and bicyclist/pedestrian network references were added to this discussion.
City of Austin	This section acknowledges WQPL mission and goals but does not speak to the method of removing property from land available for development. This speaks to TxDOT expectation that WQPL will mitigate future development.	This comment is in reference to Section 3.1.1. (Land Use - Existing Conditions). This section is intended to provide the reader with a summary of the current conditions within the study area. The indirect impacts and effects associated with induced growth of the proposed project are discussed in Appendix D and summarized in Section 4.0.
City of Austin	Omitted material. Discuss goals of Travis County draft Land, Water, and Transportation Plan, approved for Public Review & Comment by Travis Co. Commissioners Court, July 1, 2014, Item 14. Access backup here: http://traviscountytx.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=1378&Inline=True	Goals from the draft Land, Water, Transportation plan were incorporated in Section 3.1.1. "Travis County," as suggested.
City of Austin	Omitted material. CAMPO 2030 Plan includes SH 45 SW, FM 1626 - IH 35, Sponsor Hays County, 100% Locally Funded Project. $8.2 million for environmental and preliminary engineering analysis, Open year 2020 - 2025.http://www.campotexas.org/wp-content/uploads/2013/10/CAMPO_2035_Plan_Adopted_May_242010wMods.pdf	2030 plan description of project was included as suggested.

Organization	Verbatim Comment	Response
City of Austin	Table 3.1-2: Veritas Academy is Expired as of July 7, 2014	A search of City of Austin's Emerging Projects database on 10/28/14 showed Veritas Academy as "In Review." (Application expiration date in online permit system shown as 1/3/15.)
City of Austin	If 19.8% of the study area is developable land accessible by the roadway, then encroachment effects are not insignificant and the impact of development of this land should be included in the surface water and groundwater water quality impacts associated with this project.	Encroachment impacts to various resources are summarized in Table 4-2 in the Indirect Impacts Technical Report. Threatened and Endangered Species and Water Resources (Surface Water and Groundwater) are assessed in detail in both the Indirect Impacts Technical Report and the Cumulative Impacts Technical Report, folding in encroachment as an aspect of Indirect Impacts. The potential impacts from induced development to these resources have been assessed in both Technical Reports.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. The direct impacts to land use associated with the Build Alternative are not expected to be significant. Further, any direct impacts that would occur outside the ROW would be anticipated to be temporary and associated with construction.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	States that no conversion of land use from non-transportation to transportation use will occur. This is inaccurate as the build alternative includes plans to divert water from outside ROW to Flint Ridge Cave. This should be considered a transportation land use that effects the overall amount of recharge (surface and subsurface).	Changes have been made to the proposed project design that result in no disturbance outside the right-of-way for water being diverted to Flint Ridge Cave or any other known sensitive karst feature. Additionally, no impacts to the Recharge Zone are expected because no runoff is being diverted off the Recharge Zone.
City of Austin	DEIS shows Table 3.2.1 and uses data for entire, whole census tracts giving populations and population growth from 1990 to 2000 and then to 2010. The actual study area is a rectilinear polygon and only partially overlaps with the five census tracts. The vast majority of the population growth that occurred from 1990 to 2010 within the set census tracts happened outside of the actual study area. Approximately about 15% of the growth listed on the table occurred within the actual study area. Table 3.2.1 is grossly misleading.	The intent of Section 3.2.1 and Table 3.2.1 was to show existing conditions of the general area. As the project area only includes one block group, the full bounds of the adjacent census tracts provides a better representation of the surrounding population; therefore, the Socioeconomic Study Area is comprised of the 5 census tracts shown on Figure 3.2-1 and described in the footnote to the table. The footnote to Table 3.2-1 was revised to clarify this point.

Organization	Verbatim Comment	Response
City of Austin	Using tract-level median household income (MHI) and then stating that no tract's MHI is below the federal poverty level and therefore there are no low income populations is a highly unorthodox way of testing for EJ issues, especially given the fact that in an earlier section the DEIS offers actual poverty rates for the collection of block groups in the area.	TxDOT follows Federal Highway Administration's approach when identifying low-income populations for environmental justice analysis. Federal Highway Administration defines "low-income" as "a person whose median household income is at or below the Department of Health and Human Services poverty guidelines" (Federal Highway Administration Order 6640.23A). U.S. Census poverty rates were presented in the Socioeconomic Affected Environment section (3.2.1) to provide additional economic background information, but are not used to identify low-income populations for purposes of environmental justice analysis.
City of Austin	Using tract-level median household income (MHI) and then stating that no tract's MHI is below the federal poverty level and therefore there are no low income populations is a highly unorthodox way of testing for EJ issues, especially given the fact that in an earlier section the DEIS offers actual poverty rates for the collection of block groups in the area.	TxDOT follows Federal Highway Administration's approach when identifying low-income populations for environmental justice analysis. Federal Highway Administration defines "low-income" as "a person whose median household income is at or below the Department of Health and Human Services poverty guidelines" (Federal Highway Administration Order 6640.23A). U.S. Census poverty rates were presented in the Socioeconomic Affected Environment section (3.2.1) to provide additional economic background information, but are not used to identify low-income populations for purposes of environmental justice analysis.
City of Austin	Extremely vague references to census data that give information on the number and type and wage rate of jobs within the study area. These must be estimates from a dataset known as Local Employment Dynamics that are produced by the Census Bureau--but this should be clearly attributed as such and not confused with the far more solid population data from the decennial census.	Census data estimates in the Economic Characteristics subsection are provided by the US Census Bureau's OnTheMap, a web-based mapping and reporting application that provides data on employment, earnings, industry distributions, and demographics obtained from the Longitudinal Employer-Household Dynamics program. This information is cited as coming from: U.S. Census Bureau, 2013b, "OnTheMap," Longitudinal Employer-Household Dynamics in the References section. In the Final EIS, a clearer differentiation of this information from decennial census data will be made.
City of Austin	There appears to be a typo or mistake of some sort as the DEIS states that 91% of the housing stock is occupied (this is correct) and that 91% of these units are owner occupied--the actual figure is closer to 80%.	According to the U.S. Census Bureau's 2012 American Community Survey 5-year estimates for the block groups cited (CT 17.70 BGs 2 & 3, CT 17.72 BG 1, CT 17.74 BGs 2 & 3, CT 17.75 BG 1), owner-occupied homes comprise 89.8 percent of occupied homes (Table B25003, "Tenure"). The 91 percent figure was changed to "approximately 90 percent."
City of Austin	The DEIS states that the Shady Hollow CDP overlaps some parts of the City of Austin--this is untrue as CDPs by definition are areas of population concentrations outside of incorporated jurisdictions.	The discrepancy was corrected in Figures 3.1-1 and 3.2-3, and in the text of Section 3.2.1, by adding the city of Austin boundaries from the 2010 Census to the figures so that the boundaries of the census designated place (also from the 2010 Census) do not overlap the city's boundaries from that time.
City of Austin	There is additional confusion about the owner occupancy rate…DEIS states Shady Hollow is 98% owner occupied when in fact the true figure is 93.5%.	According to the U.S. Census Bureau's 2012 American Community Survey 5-year estimates for Shady Hollow census designated place, owner-occupied homes comprise 98.8 percent of occupied homes (1787 owner-occupied/1809 occupied) (Table DP04, "Selected Housing Characteristics"). The Draft EIS states "over 98 percent...are owner occupied"
City of Austin	Existing travel patterns to primary destinations; The 41% of all through trips captured destined for MO Pac should be an absolute number, i.e. 41% is XX out of XXXXX	This section of the Final EIS has been updated to include the traffic volumes in calculating the percent of through trips. Additionally, the referenced study has been included in Appendix N.

Organization	Verbatim Comment	Response
City of Austin	Table 3.2-9 Daily Traffic Volumes do not match source data	Daily traffic volume information in Table 3.2-9 was obtained from TxDOT's Traffic Forecasting Methodology Memorandum (source was cited below the table). Figure 3 on page 3 of this memorandum contains the information cited in the Final EIS table. This memorandum is included in Appendix N in the Final EIS.
City of Austin	Clarify if the travel time estimates from the 2035 model included improvements to roadways (e.g., MoPac) other than the proposed SH45 SW	The travel time estimates created using Capital Area Metropolitan Planning Organization's travel demand model do assume that all other planned projects listed in the 2035 Regional Transportation Plan are constructed. This clarification will be added to Table 3.2-10 as a footnote.
City of Austin	Inconsistent definitions of low income…earlier sections equate low income with below the poverty level whereas in this section it is defined (more accurately) as 50% of the family population with income at or below 80% of county median or a poverty rate of 25%.	The definition of low-income provided on page 78 (TAZs with at least 50 percent of residents in families earning less than 80 percent county MFI…) was used by Capital Area Metropolitan Planning Organization to develop their regional toll analysis (Regional Toll Network Analysis, 2013). For purposes of identifying low-income populations for project-level environmental justice impact analysis, the Draft EIS uses the FHWA definition (described on page 55) of low-income (household income at or below DHHS poverty guideline). The Capital Area Metropolitan Planning Organization definition is provided to help readers understand how the EJ TAZs were determined in the regional toll analysis conducted by Capital Area Metropolitan Planning Organization (and attached to the EIS as Appendix F).
City of Austin	RTG,2014 formulas and calculations should be in Appendix	This information has been included in Appendix N.
City of Austin	Atkins, 2013 survey data and calculations should be in Appendix	This information has been included in Appendix N.
City of Austin	TxDOT, 2014 Traffic Forecasting Methodology Memorandum should be in Appendix	This information has been included in Appendix N.
City of Austin	Potential Users of the Toll Facility; The 2nd paragraph is misleading by saying 61% of drivers traveling north on FM 1626 use Brodie. From source data; 7,746 vehicles were counted going north at site #2, of those vehicles 1,588 were matched at destination locations, 790 of these vehicles passed through site #2A and #6 on Brodie, i.e. 10% of drivers (790 out of 7,746) traveling north on FM 1626 were matched at cameras on Brodie.	This section in the Final EIS has been updated to more accurately reflect the referenced study (SH 45SW/Brodie Lane Area Traffic Engineering Study, attached as Appendix B to the Draft Traffic Forecasting Methodology Memorandum completed for TxDOT in March 2013). The revised sentence states: "Based on the results of this survey, approximately 61 percent of the total through trips from/to FM 1626 at Site #2 (FM 1626 south of Brodie Lane) utilized Brodie Lane to conduct their travel".
City of Austin	AASHTO guidance suggest that the following be used for documenting cumulative impacts. The DEIS falls shore of following this guidance. Explain the Methodology. Just as important as selecting a reasonable methodology is the importance of clearly explaining why that methodology was selected. The advantages and disadvantages/drawbacks of the methodology should be acknowledged, not ignored. Provide Factual Support. The evaluation of trends and conclusions about environmental consequences should be based on up- to-date factual information. Graphs, tables, and other graphic elements should be incorporated, where appropriate, to aid readability. Use Clear Reasoning. The conclusions of the assessment should be supported by logical analysis and plausible reasoning, and not contain internal inconsistencies or	American Association of State Highway and Transportation Officials guidance was one of the documents used to form the foundation for both the Indirect and Cumulative Impacts Technical Reports. The Guidance sections of each Technical Report explain the organization and approach for preparing each analysis. Planning Judgment, Collaborative Judgment, and Cartographic Analysis are valid methodologies for conducting Indirect and Cumulative Impact Analyses, and were particularly useful for this project in order to capture professional feedback from more than a dozen entities who responded to the project questionnaires. Extensive mapping was conducted to measure and depict impervious cover over time in the Groundwater RSA, with a detailed methodology appendix included. Tables and Figures are used for assessment of all resource categories, and various planning and vision maps and tables are included in the Cumulative Impacts Technical Report to illustrate how this project was analyzed with respect to other projects and plans. Factual support has been provided as evidenced in the 100+ technical citations provided for the two reports. This analysis explains the methodology, provides factual support, uses clear reasoning, and meets the keys to legal

Organization	Verbatim Comment	Response
	contradictions that put the results into question. It also is important to document the uncertainties involved in the analysis, explain the importance of those uncertainties, and explain how they have been addressed. Legal Sufficiency Criteria. For a more detailed list of factors to consider in assessing the legal sufficiency of indirect effects and cumulative impacts analyses, refer to Appendix 1A (indirect effects) and Appendix 1B (cumulative impacts). These lists also are based on the recommendations in the NCHRP report, Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts.	sufficiency also identified in TxDOT's Guidance, including knowing the difference between indirect and cumulative impacts, making a good faith effort to explain impacts, engage partners, and have record support.
City of Austin	The DEIS notes that additional karst surveys are underway and results will be included in the final EIS. Because this geologic assessment is incomplete, the actual roadway alignment and BMPs necessary to prevent degradation of aquifer recharge quality and quantity cannot be determined. Inclusion in the final EIS does not provide sufficient opportunity for public and participating agency review and comment. Conclusions of the impacts of the project on the Edwards Aquifer in the DEIS are thus incomplete and not valid because of this missing data.	The public was provided the opportunity to review and comment on the most recent karst studies and Geologic Assessment when they were published on Nov. 7, 2014.
City of Austin	The surface catchment area shown for Flint Ridge Cave is not accurate, and does not reflect the most current City of Austin analysis of 58 acres (see Hauwert et al. 2014.)	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed.

Organization	Verbatim Comment	Response
City of Austin	The DEIS does not reflect the importance of sub-surface recharge to specific karst features like Flint Ridge Cave or the importance of upland recharge to the Barton Springs Segment of the Edwards Aquifer as previously documented (see for example the Cowan and Hauwert 2013 reference included in the DEIS). Impacts to Flint Ridge Cave and the Edwards Aquifer cannot be accurately assessed without analysis of the loss of upland recharge from the impervious cover associated with the project or the loss of subsurface recharge to features like Flint Ridge. See: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:9	Upland recharge rates vary between published studies, many of which are presented in the Draft EIS to establish a probable range of recharge rates. Regardless of the particular rate, the design team has proposed elements including best management practices that would increase the likelihood of recharge of treated stormwater runoff. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas technical report for further discussion of impacts and minimization of impacts to Flint Ridge Cave.
City of Austin	It appears that many of the citations to karst may not be the current and best available information	Latest, best available scientific data is included in the technical report Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.
City of Austin	For updated estimates on amount of precipitation that recharges the aquifer, see: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:10	Water budget analysis reveals that recharge rates outside major stream beds reported in Hauwert and Sharp 2014 are too high (see Slade, R.M. Jr., 2014, Documentation of a recharge-discharge water budget and main-streambed recharge volumes, and fundamental evaluation of groundwater tracer studies for the Barton Springs Segment of the Edwards Aquifer: Texas Water Journal, Vol. 5 No. 1). Based on Slade, 2014 the long-term mean percentage of direct precipitation that actually contributes to recharge is no more than 6.6 percent over the recharge area.
City of Austin	Impacts on geologic resources are not minor if at least 7 karst features are directly impacted. Surface catchment areas to point recharge features will be impacted by construction activities and paved over by the highway (e.g., Flint Ridge). Impacts to subsurface catchment areas to recharge features are not assessed in the DEIS.	The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of these sensitive karst features. The surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features. More information is available in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report.
City of Austin	Impacts to sensitive karst invertebrates are not considered, particularly as a result of Solenopsis invicta (fire ant) or tawny crazy ant invasion as a result of the large amount of soil importation that would be required for highway construction.	Given the nature of the species, there is no practical means of addressing the importation of tawny crazy ants with fill material. Plans will be developed for management of areas around karst features, including Flint Ridge Cave. TxDOT is discussing the management of the area around Flint Ridge Cave with the City of Austin.
City of Austin	What are the proper techniques that will be used to control erosion during construction	The Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan prepared during final design (plans, specifications and estimates, prior to beginning construction) will include a range of appropriate erosion control techniques.

Organization	Verbatim Comment	Response
City of Austin	Asserts that construction BMPs will effectively minimize soil loss. There is no design or specification information available in order to support this determination or evaluate its assertion.	The Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan prepared during final design (plans, specifications and estimates, prior to beginning construction) will include a range of appropriate erosion control techniques.
City of Austin	States no hydric soils are present. However, USACE and EPA recently issued an interpretive rule on Waters of the US. This DEIS does not address whether the project involves waters of the USA regarding Bear Creek.	Waters of the U.S. are described in the Final EIS (Section 3.7) and in Appendix J.
City of Austin	States that project will directly impact openings of 7 features. Will it impact the extent of the features, recharge value of these features, and/or water quality of these features. The 1990 BSEACD consent decree should be checked to determined how these new features were to be handled.	These and all other features will be handled in accordance with TCEQ standards and applicable requirements of the Consent Decree.
City of Austin	If features are permanently backfilled or covered by impervious surfaces, an equivalent amount of recharge should be added as mitigation for loss of recharge. The surface drainage area of multiple features will be negatively impacted by the roadway. Loss of recharge to the Edwards Aquifer would negatively impact and could constitute take of the federally endangered Barton Springs Salamander and Austin Blind Salamander species. Loss of spring recharge from development including alteration of subsurface flow paths and alteration of drainage areas to karst features is identified as a threat to endangered Austin Blind Salamander (see final rule for listing Austin Blind Salamander, FWS–R2–ES–2012–0035).	No significant features would be filled or covered. Appropriate efforts to preserve recharge quality and quantity have been included for each impacted sensitive feature. These protection measures are detailed in the Final EIS. Surface recharge areas for each potentially significant feature are illustrated in the Biological Evaluation and in the Final EIS. Additionally, best management practices have been designed to increase recharge potential in other areas.

Organization	Verbatim Comment	Response
City of Austin	Confirm if the highway will allow for transport of hazardous materials across the recharge zone. Hazardous material spills from roadways are identified as having the potential to cause take of federally endangered Austin Blind Salamander (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035). Identify the BMPs that will be used to prevent hazardous material spills from entering karst features directly, from infiltrating thru the porous friction pavement or entering the aquifer via subsurface infiltration.	Hazardous material cargo would not be explicitly prohibited from using SH 45SW; however, the Central Texas Regional Mobility Authority would prohibit permitted load hazardous material vehicles from driving on the facility. The project design also includes best management practices and protections for each sensitive karst feature impacted by the proposed project. Natural buffers and drainage controls would be established around sensitive features, including water quality ponds/hazardous materials traps. Refer to Sections 3.3, 3.6 and Appendix H of the Final EIS for discussion of best management practices. Refer to Section 3.11 for discussion of hazardous materials.
City of Austin	The list of structural stormwater BMPs does not include bioretention or City of Austin Save Our Springs Ordinance compliant stormwater control measures including retention-reirrigation ponds.	Retention/irrigation and biolfiltration are types of water quality ponds that were considered. Retention/irrigation was dropped from the list due to maintenance and pump issues. Batch detention was favored over biolfiltration or bioretention because it had higher total suspended solids removal efficiency. Retention reirrigation was dropped from the list due to maintenance and pump issues.
City of Austin	This section only address particulate pollutants like TSS and does not analyze dissolved pollutants including metals and hydrocarbons. Dissolved pollutants have been documented to be associated with declines in endangered salamander populations, and increase with increasing impervious cover (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035).	Total suspended solids is a regulated constituent under the Edwards Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final EIS (Appendix H--Water Quality and Aquatic Resource Protection Technical Report). TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation and report titled: Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
City of Austin	Evaluation of pollutant removal by stormwater structural control measures using a percent removal method is not consistent with the current state of practice. An effluent probability method as advocated by the International BMP Database that utilizes effluent concentration based methods would more accurately evaluate the effectiveness of stormwater BMPs in series. The conclusion that long- term stormwater runoff from the project post-construction would be of higher quality than the current undeveloped condition is patently false and should be removed.	Load determinations were made in accordance with the current regulatory methodology accepted by the Texas Commission on Environmental Quality.

Organization	Verbatim Comment	Response
City of Austin	Quantify the loss of recharge thru direct entry into the affected karst features as well as a result of loss of subsurface infiltration. The claim that there will be no adverse impact to listed species or the aquifer is unsubstantiated.	The surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features. Regarding the potential for loss of subsurface infiltration, all stormwater runoff from the proposed roadway would be treated by water quality best management practices prior to release. While some water may be diverted from recharging in upland areas, water would be released (following treatment) and would be able to recharge to the aquifer. In addition, it is expected that very little water reaches the aquifer via direct percolation through the ground within the state-owned right-of-way owing to the comparatively thick covering of clayey terra rossa soils. A discussion of the sensitive karst features within the state-owned right-of-way is located in Section 3.3. More information is available in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report.
City of Austin	Throughout the DEIS there are numerous mentions of importing materials to the site such as …"Examples of structural BMPs that would be used during project construction include mulch logs…", It appears that the DEIS has completely ignored the major threat of introducing invasive species such as the Tawny crazy ant (Nylanderia fulva) via the importation of offsite materials.	The design team has consulted sources regarding best management practices for the prevention of invasive species importation and no suitable techniques or approaches have been found. If practicable techniques are discovered they would be implemented as they are consistent with Integrated Pest Management strategies of avoiding site contamination.
City of Austin	Although contrary to this section, the proposal to treat runoff and dispose off-site will directly affect recharge.	Comment noted.
City of Austin	This section does not speak to direct or indirect impacts to discrete recharge that occurs through karst that is not visible on the surface. It does not at all address the fact that this site is one of the most karst rich areas in all of Travis and Hays Counties.	Comment refers to Soils and Geology, section 3.3. See also Section 3.6 Edwards Aquifer/Groundwater Resource and Section 3.8 Ecological Resources for discussion of karst features as recharge features and habitat. Indirect impacts to recharge are addressed in the Indirect Impacts Technical Report for State Highway (SH) 45 Southwest from State Loop 1 (MoPac) to Farm to Market (FM) 1626, Travis and Hays Counties, Texas
City of Austin	Provides no details on water quality measures. Defers to WPAP comment period and provides no opportunity for public review and comment as part of this DEIS process. Another example of where the DEIS is incomplete.	The Draft EIS and Final EIS include substantial details on water quality measures (see Appendix H, Water Quality and Aquatic Resource Technical Report). Further details on water quality measures will be included in the Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan to be prepared during the final design phase.
City of Austin	The current Texas Commission on Environmental Quality guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with Texas Commission on Environmental Quality regulations and guidance.	Infiltration via pervious concrete is not proposed as the road will be impervious. Rather a porous overlay is proposed that will filter stormwater. The subgrade of the pavement will be impervious.

Organization	Verbatim Comment	Response
City of Austin	Replace the statement - "In 2002, the Austin-Round Rock MSA, consisting of Bastrop, Caldwell, Hays, Travis, and Williamson Counties, voluntarily entered into an Early Action Compact (EAC) with the Texas Commission on Environmental Quality and the Environmental Protection Agency (EPA) to proactively address and implement emission reduction strategies before being designated nonattainment upon promulgation of new eight-hour ozone NAAQS. The Austin-San Marcos area participates in the EPA's eight-hour Ozone (O3) Flex Program and the Austin-Round Rock-San Marcos area participates in the EPA's Ozone Advance Program. Participation in these voluntary programs has resulted in the development and implementation of an emission reduction plan to assure attainment of the eight-hour ozone standard by 2007 and maintenance through 2015. " to read as "In January 2014 the Austin-Round Rock MSA, consisting of Bastrop, Caldwell, Hays, Travis and Williamson Counties, entered into the Ozone Advance Action Plan with the Texas Commission on Environmental Quality and EPA. The plan builds on the work of previous plans - the One Hour Ozone Flex Plan (2002), the Early Action Compact State Implementation Plan (2004), and the Eight Hour Ozone Flex Plan (2008) - and is intended to keep the region in attainment of the current ozone standard of 75 parts per billion, reduce ozone levels enough to remain in attainment of anticipated future standards, and improve public health, particularly for vulnerable populations. The Ozone Advance Action Plan is in effect until December 31, 2018." source: background section of Ozone Advance Plan http://www.capcog.org/documents/airquality/OzoneAdvanceOutreach/Austin- Round_Rock_MSA_OAP_Action_Plan.pdf	Change made as requested.
City of Austin	Replace the statement - "Due to the EAC efforts, the Austin-Round Rock area counties were designated in attainment for 8-hour ozone as of July 2012 (Texas Commission on Environmental Quality, 2013). " to read as "Due to the efforts of the Clean Air Coalition under the Eight Hour Ozone Flex Plan the Austin-Round Rock MSA was designated in attainment for 8-hour ozone as of July 2012 (Texas Commission on Environmental Quality, 2013).	Change made as requested.
City of Austin	Assertion that because of WQPL, impacts from encroachment are insignificant. The correct interpretation is that because WQPL has removed so much areas from development the impact from encroachment is very significant. Fundamental flaw in DEIS reasoning.	Because SH 45SW would be a limited access facility and the majority of adjacent lands would be preserved in perpetuity and not allowed to develop, encroachment-alteration effects are expected to be insignificant.

Organization	Verbatim Comment	Response
City of Austin	Modify this statement - "The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required. " to read as "The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Carbon Monoxide (CO) Traffic Air Quality Analysis was not required.	Sentence will remain as written. This language comes from TxDOT's Air Quality Standards of Uniformity (2013).
City of Austin	Rather that stating that the VMT will be slightly higher under the Build Alternative, please provide a percentage to let the reader know how much higher the VMT is expected to be.	The proposed project increases vehicle miles traveled by 15 percent over the no build option. Percentage is added to text in the Final EIS. Data is presented in report: Draft Traffic Forecasting Methodology Memorandum for SH 45SW (TxDOT 2014).
City of Austin	Correct "Under the each alternative there may be… "to "Under each alternative there may be…"	Change made as requested.
City of Austin	Does not identify values and effects of noise levels on protected undeveloped property and sensitive wildlife.	The noise analysis conducted for this project was done in compliance with TxDOT's 2014 Guidelines for Analysis and Abatement of Roadway Traffic Noise. A noise impact occurs when either the absolute or the relative criterion is met: Absolute criterion: The predicted noise level at the receiver approaches, equals, or exceeds the Federal Highway Administration Noise Abatement Criteria for the receiver's specific activity category. "Approach" is defined by TxDOT guidance as a predicted noise level of 1 dBA below the Noise Abatement Criteria. Relative criterion: The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the Noise Abatement Criteria. "Substantially exceeds" is defined as a more than 10 dBA increase in predicted noise levels over existing levels. The Water Quality Protection Lands have been identified as Activity Category G, for which there is not an absolute noise criteria. For impacts to be assessed under a relative noise criteria, a receptor point has to be established in order to determine impacts and assess abatement measures. Since a receptor point cannot be established for the undeveloped lands, an impact cannot be determined and therefore abatement measures were not considered. See Section 3.5 for an updated noise analysis.
City of Austin	Noise impacts to R8 should receive some sort of mitigation. Additional woody vegetation preservation and protection in the SH45SW ROW between the proposed roadway and the noise receiver should be considered at a minimum, but not as the only intervention.	TxDOT regulations specify that any mitigation for a noise impact must meet two criteria: 1) the noise abatement measure must be feasible in that it is able to reduce the noise level at greater than 50 percent of impacted 1st row receivers by at least 5 dBA, and 2) the abatement measure must be reasonable in that it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least 5 dBA and the abatement measure must be able to reduce the noise level for at least 1 impacted 1st row receiver by at least 7 dBA. The noise abatement measures considered did not meet the 2nd criterion for impacted receiver R8. Therefore, no noise abatement measures are proposed for this receiver.

Organization	Verbatim Comment	Response
City of Austin	DEIS states that karst aquifers have unique hydrogeology that results in aquifers that are highly productive but vulnerable to contamination yet does not include the most recent data on karst features within the ROW to help determine potential impacts of the roadway on the karstic Edwards Aquifer.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final Environmental Impact Statement and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. Based on these findings, 17 sensitive karst features are located within the state-owned right-of-way. The alignment has been adjusted to minimize impacts to sensitive features, as discussed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	Fig 3.6.1 shows water wells within the project AOI but ignores the well-known fact that in karst aquifers, like the Edwards, wells can be impacted quickly that are far (miles) downgradient of the project. This is supported by results from dye tracing in the area of the road project that reached wells miles away within hours. Reference is Hauwert 2013, COA SR-13-01.	No water wells would be impacted by the proposed project. Water quality and quantity would be maintained by implementing best management practices. Stormwater runoff from the facility would be captured and treated prior to be released. The treatment process would be in compliance with the Edwards Aquifer Rules.
City of Austin	Figure 3.6-1 does not depict the USGS NAWQA well on Edwards Crossing, does not depict the windmill well north of the pond on Tabor, does not depict wells on Weisbart and Yates conservation easements and does not identify springs in Bear Creek on Tabor and on Marbridge.	Updated well and spring data has been obtained from the Barton Springs Edwards Aquifer Conservation District and is included in the Final Environmental Impact Statement and associated technical reports (Appendix D - Indirect Impacts, and Appendix I - Cumulative Impacts). Based on the data, there are no wells or springs within the state-owned right-of-way.
City of Austin	The well inventory is incomplete. Barton Springs Edwards Aquifer Conservation District records indicate 150 wells in the area of influence. This section should be re-evaluated to consider all affected wells	Updated well data has been obtained from the Barton Springs Edwards Aquifer Conservation District and is included in the Final EIS, Indirect Impacts Technical Report (Appendix D) and Cumulative Impacts Technical Report (Appendix I).
City of Austin	Upland recharge has been identified as an important component of recharge to the Edwards Aquifer, and may be 26% of rainfall in upland areas. See: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:9; See: Hauwert. 2009. Groundwater Flow and Recharge within the Barton Springs Segment of the Edwards Aquifer, Southern Travis County and Northern Hays Counties, Texas: Ph.D. Diss., University of Texas at Austin	Based on TxDOT's studies and literature researched, the majority of the water that recharges the Barton Springs segment of the Edwards Aquifer enters the aquifer from the channels of six major creeks that cross the Recharge Zone, including Bear Creek in the state-owned right-of-way. The remaining recharge occurs as a result of infiltration from upland areas, including lesser drainages, probably some leakage from adjacent aquifers and, under extremely low flow conditions, influx from the San Antonio segment of the Edwards Aquifer. Within the state-owned right-of-way, it has been found that the majority of recharge occurs within Bear Creek. This may be partially influenced by the terra rossa clays found in some parts of the state-owned right-of-way, which have impeded the development of some drainage basins and limited the ability for water to recharge in upland areas. These findings

Organization	Verbatim Comment	Response
		are discussed further in the Final EIS and the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	Discussion on groundwater recharge needs to include recent work by Cowen and Hauwert (2013) that shows recharge to caves through soils and Hauwert and Sharp (2014) that shows a relatively high percent of rainfall can recharge the aquifer through soils.	The potential for recharge through upland soils is discussed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas, including a detailed site-specific investigation of soil conditions in the SH 45SW right-of-way. TxDOT considers the investigations conducted within the SH 45SW right-of-way to be the best available scientific data for analyzing potential effects of the proposed project in the SH 45SW right-of-way.
City of Austin	The study area should be enlarged to reflect well documented fact that water can move very rapidly though a karst aquifer and impact wells miles away quickly.	The study area developed for the project allows for adequate assessment of impacts, including indirect and cumulative impacts. See the Area of Influence map (Figure 3-1 in Appendix D, Indirect Impacts Technical Report, of the Draft EIS) and the Resource Study Areas maps (Figures 5-1 through 5-6 in Appendix I, Cumulative Impacts Technical Report, of the Draft EIS).
City of Austin	The time it takes for water from the general project area is not "estimated" but has been well documented to vary from 2-3 days to weeks.Statement is not clear if it applies to only the project area or the aquifer in general.	Language in the Final EIS has been changed from: "estimated" to "documented." The statement refers to the Barton Springs Segment of the Edwards Aquifer.
City of Austin	Text does not identify NAQWA well on Edwards Crossing	The Final EIS and associated technical reports (Appendix D - Indirect Impacts, and Appendix I - Cumulative Impacts) include additional water well data provided by the Barton Springs Edwards Aquifer Conservation District.
City of Austin	This section does not speak to WQ monitoring by COA associated with Bradley settlement. Mapping does not depict these wells.	The Final EIS and associated technical reports (Appendix D - Indirect Impacts, and Appendix I - Cumulative Impacts) include additional water well data provided by the Barton Springs Edwards Aquifer Conservation District.
City of Austin	As noted in the DEIS with the citation of Herrington and Hiers 2010 (incorrectly cited as 2009), water quality in Barton Springs is degrading over time. This is in spite of the existence of the Edwards Rules, and indicates that the Edwards Rules alone are not sufficient to maintain the quality of Barton Springs discharge.	Comment noted.
City of Austin	The closure of Barton Springs Pool after the Statesman article was focused specifically on PAH's in sediment in the pool and not just about "water quality" in general as the DEIS states. The PAH's in the sediment were later traced to a specific nearby source.	Comment noted.
City of Austin	DEIS should clarify that BSP is only closed after storm events that cause the pool to flood. As currently stated, the DEIS implies that BSP is negatively impacted by everyday storm/rain events requiring closure.	Comment noted.

Organization	Verbatim Comment	Response
City of Austin	This section only address particulate pollutants like TSS and does not analyze dissolved pollutants including metals and hydrocarbons that could originate from the project and enter the aquifer thru direct or diffuse recharge. Dissolved pollutants have been documented to be associated with declines in endangered salamander populations, and increase with increasing impervious cover (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035).	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation, which is included as an attachment to the Final EIS. Total suspended solids is a regulated constituent under the Edwards Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final EIS (Appendix H--Water Quality and Aquatic Resource Protection Technical Report).
City of Austin	This section does not address the impact of hazardous material spills on the quality of aquifer recharge or potential impacts to endangered salamanders at Barton Springs. Hazardous material spills from roadways are identified as having the potential to cause take of federally endangered Austin Blind Salamander (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035). Identify the BMPs that will be used to prevent hazardous material spills from entering karst features directly, from infiltrating thru the porous friction pavement or entering the aquifer via subsurface infiltration.	Permeable Friction Course pavement will be underlain by impervious layers. No direct recharge will be possible through the Permeable Friction Course. The majority of the roadway will be serviced by water quality treatment ponds that will have hazardous materials detainment capabilities. Roadway surface runoff would be captured and conveyed away from sensitive features to treatment ponds, this would allow for spill capture.
City of Austin	What analyses were conducted to conclude that impacts to aquifer recharge quality and quantity are minimal? No analyses are listed	Regarding water quality, calculations and analyses for anticipated total suspended solids annual loads are presented in Section 3.6.2 of the Final Environmental Impact Statement. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids. Regarding water quantity, a discussion of potential impacts is provided in Section 3.6.2 of the Final EIS.
City of Austin	Evaluation of pollutant removal by stormwater structural control measures using a percent removal method is no consistent with the current state of practice. An effluent probability method as advocated by the International BMP Database that utilizes effluent concentration based methods would more accurately evaluate the effectiveness of stormwater BMPs in series. The conclusion that long- term stormwater runoff from the project post-construction would be of higher quality than the current undeveloped condition is patently false and should be removed.	Load determinations were made in accordance with the current regulatory methodology.

Organization	Verbatim Comment	Response
City of Austin	Provide references and calculations for the percent removal of each type of BMP listed to support the claim of achieving 90% TSS removal. Also include removal efficiencies for nutrients and dissolved constituents.	Load determinations were made in accordance with the current regulatory methodology. References and calculations are given in Appendix H and in Section 3.7 of the Final EIS. Total suspended solids is a regulated constituent under the Edwards Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final EIS (Appendix H--Water Quality and Aquatic Resource Protection Technical Report).
City of Austin	Describe the void mitigation plan that will be used to address any voids encountered during excavation, trenching, drilling and boring activities.	The Final EIS has been updated to provide more details of the procedures that will be used in the event a void is encountered during construction. These void discovery protocols are described in Appendix H.
City of Austin	TSS in stormwater runoff during construction also has the potential to be a long-term impact as sediment deposited in karst aquifers during low flow periods can be remobilized during subsequent rain events or during periods of high groundwater velocities in the aquifer and migrate to discharge points.	This phenomenon is included as part of the rationale for and in support of the minimization of total suspended solids loading associated with the proposed project. This phenomenon is discussed further in the Draft EIS. The current design would be expected to result in a decrease in annual total suspended solids loading from the state-owned right-of-way. In other words, in terms of total suspended solids, the project would result in improved conditions through lessened loads.
City of Austin	DEIS states that the "proposed project would result in negligible impact to the Barton Springs segment of the Edwards Aquifer" without including the most recent karst data to evaluate those impacts or showing data to justify those conclusions.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final Environmental Impact Statement and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. Based on the findings, 17 sensitive karst features are located within the state-owned right-of-way. The alignment has been adjusted to minimize impacts to these sensitive features, as discussed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	Street sweeping is not typically a BMP used for operational highways. Road closures for this purpose would be difficult. The DEIS should provide references and analysis that demonstrate that sweeping is effective for maintaining the water quality function of pervious pavement.	Various forms of debris removal, including sweeping can be and are used in similar situations. Additional detail on street sweeping is available in Appendix H.
City of Austin	Is the multiuse trail included in the calculation of impervious cover? It would be very helpful if the DEIS explained how impervious was calculated for the roadway.	Yes, the impervious cover calculations include the trail. Impervious cover is defined on page 140 of the Draft EIS. The impervious cover calculations were calculated based on the placement of surfaces applied to the ground that are not penetrated by water.

Organization	Verbatim Comment	Response
City of Austin	Does not speak to changes in upland groundwater recharge from installations of berm to divert runoff to treatment and Bear Cr, direct impacts to recharge from installation of bentonite cap, and effects from installation of diversion to divert new flows to Flint Ridge Cave that will decrease levels of dilution.	Project design has been modified to eliminate the berm and its water diversion.
City of Austin	More details are necessary about the Environmental Compliance Plan. Will the plan manager be independent of the contractor, and have stop work authority? How frequently will BMPs be inspected? What are the water quality guidelines that will be used for assessment?	The environmental compliance plan will be developed during Plan Specifications & Estimate development. The manager would be independent and have the authority to stop work if necessary. Best management practices would be inspected as described in the Environmental Compliance Management Plan and applicable water quality guidelines would be followed.
City of Austin	Additional construction impacts not considered are the importation of fill material. Will fill material nutrient content match soil nutrient content of existing native soils?	The contractor will be responsible for obtaining fill material. The source will be coordinated with the environmental compliance manager and TxDOT personnel prior to bringing fill onto the project site. Nutrient content matching is not proposed.
City of Austin	DEIS should indicate what BMPs were used during the construction of existing SH45 where Barrett et al, 1995b detected increases in some pollutants.	The Final EIS has been updated to include the following information (Section 3.6.2): The monitored construction site included typical best management practices such as silt fence and rock berms. The study also noted the transitory nature of the effects by indicating that the stream conditions downstream of the site returned to preconstruction conditions soon after construction was completed.
City of Austin	Since concentrations of pollutants are presented in other sections of the DEIS they should also be presented here during discussions of pollutants in runoff during the construction of the existing SH45.	Studies are cited in the Draft EIS and Final EIS that discuss construction phase pollution concentrations from data collected at sites in the project area in Section 3.6.2 and 3.7.2.
City of Austin	A study of pollutants on rooftops adjacent to MoPac north of the Colorado River found significant atmospheric deposition of PAHs, arsenic, chromium, and copper over 300 ft. from the road surface (Mahler and Van Metre, 2003). Since 38 acres of the land for the ROW was purchase from blocks of land acquired for water quality protection and adjacent land still has that purpose, the DEIS should address impacts from airborne pollutants from the highway on these lands.	U.S. Environmental Protection Agency has identified under the Clean Air Act Amendments, their conformity rule, and the 2007 Mobile Source Air Toxins rule, the air emissions from transportation sources that are potentially significant, which does not include arsenic, chromium, or copper. Polycyclic aromatic hydrocarbon compounds are considered under Mobile Source Air Toxins. The conformity rule provides specific requirements for how to address National Ambient Air Quality Standards and their pre-cursors both regionally and through project-level hot-spot analyses. Since this project is located in area in attainment or unclassifiable for all National Ambient Air Quality Standards, U.S. Environmental Protection Agency does not require that this project be subject to the requirements of the conformity rule. A localized worst-case carbon monoxide analysis is often prepared for projects that meet a minimum traffic volume thresholds. This project does not meet this minimum threshold and therefore, even under worst-case conditions, would not be expected to result in a potentially significant carbon monoxide impact. In regards to Mobile Source Air Toxins, a qualitative analysis has been provided identifying that overall concentrations of Mobile Source Air Toxins are expected to decline significantly in the future, even with a significant increase in vehicle miles traveled, regardless of the build or no-build alternative.

Organization	Verbatim Comment	Response
City of Austin	It is encouraging to see the inclusion of the on-site full-time environmental compliance manager for this project. However, unless this manager is allowed and encouraged to enforce compliance and impose penalties on contractors the ECM will have little, if any, leverage over highway contractors.	Comment noted. The Environmental Compliance Manager would oversee construction activities and coordinate responses to environmental incidents. The Environmental Compliance Manager would be a third party not employed directly by the construction firm and would not be subject to removal without TxDOT/Central Texas Regional Mobility Authority concurrence. The Environmental Compliance Manager would have the authority to stop construction activity in response to emerging environmental situations on the proposed project site. The Environmental Compliance Manager would perform or oversee water quality monitoring in Bear Creek, and would perform or oversee inspection of best management practices to ensure proper function. The Environmental Compliance Manager would also provide adaptive management proposals to remedy perceived best management practice inadequacies including the authority to add additional best management practices as necessary.
City of Austin	More information is needed to evaluate the drill shafts including, number, location and width.	Detailed information regarding drill shafts is not available at this time. This information will be developed during the Plans, Specifications, & Estimates phase of the proposed project.
City of Austin	The void evaluation criteria referred to in Appendix H does not follow current Texas Commission on Environmental Quality guidelines. Given the sensitivity of this project, measures above and beyond Texas Commission on Environmental Quality guidelines should be conducted, including downhole camera surveys of all shafts and piers.	If the proposed project is constructed, it will be in compliance with state requirements concerning void evaluations.
City of Austin	Refueling and storage of vehicles is reported to not be done in the 100 year floodplain to avoid contamination through drill holes, however, if this is done over the recharge zone these risks are still present. Leak collection, using liners (and collecting any leaks collected on a regular basis) under parking and refueling areas would help reduce these risks, but additional BMPs should be considered.	Best management practices associated with hazardous materials and refueling sites are described in Appendix H. Further Hazardous Materials Management protocols would be finalized during later phases of project development. Impervious liners at storage and refueling sites have been considered and will be considered further as a secondary containment measure.
City of Austin	Referenced Text: "BMPs would be utilized to prevent, reduce, or capture and treat runoff from the proposed project site in order to minimize impacts to water quality from erosion and sedimentation. TxDOT and the Mobility Authority would utilize appropriate temporary, construction-phase BMPs to treat runoff from the proposed roadway and minimize impacts to water quality. These BMPs would provide for up-gradient overland flow prevention, slope stabilization, and on-site sediment retention. " - Case studies of current highway construction in association with TxDOT in the Austin area demonstrate that the aforementioned approaches are not practiced and that off-site discharge are frequent occurrences (see attached photos). All of the tools and approaches that are catalogued in 3.6.2 and Appendix H (A.2) are and have been available for use by TxDOT on current and past projects, yet they have not been regularly or adequately	Comment noted. The Environmental Compliance Manager would oversee construction activities and coordinate responses to environmental incidents. The Environmental Compliance Manager would be a third party not employed directly by the construction firm and would not be subject to removal without TxDOT/Central Texas Regional Mobility Authority concurrence. The Environmental Compliance Manager would have the authority to stop construction activity in response to emerging environmental situations on the proposed project site. The Environmental Compliance Manager would perform or oversee water quality monitoring in Bear Creek, and would perform or oversee inspection of best management practices to ensure proper function. The Environmental Compliance Manager would also provide adaptive management proposals to remedy perceived best management practice inadequacies including the authority to add additional best management practice as necessary.

Organization	Verbatim Comment	Response
	employed. COA has a catalog of photos from 2013 and 2014 to document current state of practice on TxDOT highway projects. As an agency, TxDOT primarily uses standard details of various erosion and sedimentation (E&S) BMPs in the plan sets (see Appendix H, Attachment 1). There is little to no design layout of the E&S measures on the plan set, nor are there systematic designs for the entire site, including the need for phasing or adaptation to changing conditions. The implementation of highway construction E&S controls is left to the contractor on TxDOT projects. Contractors are not typically certified or educated in appropriate layout of E&S controls. They are also driven to install the minimum controls necessary to save on expenditures and maximize profit. Additionally, TxDOT contract documents do not contain performance specifications (e.g. all controls shall contain runoff from 2-year storm; effluent concentrations shall be xx mg/l from the construction site). TxDOT has limited inspection capabilities to ensure compliance with the E&S plans or with Texas Commission on Environmental Quality/SWPPP requirements. Given the lack of up front design and the lack of any system performance standards, an inspection that occurs does not have a benchmark to determine compliance. Rather, it is left to other agencies to document sediment discharges and failed or inadequate E&S controls, bring this to TxDOT's attention, ask TxDOT to employ more robust controls, then monitor the performance of those controls. This seems to have been the historic model on TxDOT highway projects. The DEIS does not describe a process for design, installation and monitoring of temporary and permanent water quality controls that demonstrates that controls will be adequate for this project and provide results different than current and past TxDOT projects in the area. General references to an Environmental Compliance Management Plan does not provide details necessary to demonstrate this can or will happen. This report should have detailed the process, goals, and components of the referenced Environmental Compliance plan in order for the EIS.	
City of Austin	Simply evaluating voids based on investigation criteria does not guarantee that there will be no impacts.	Comment noted. The intent of void evaluation is to document the evaluation process and to minimize impacts.
City of Austin	Calculations of the TSS in runoff should also include what the loads are as well.	The projected final loads for the project area are provided in Final EIS Sections 3.6 and 3.7 and in several locations in the Appendices.

Organization	Verbatim Comment	Response
City of Austin	Page 141 references the Barrett et al 1995d study as being conducted during construction, Table 3.6.2 should clarify if the highways runoff values are during construction or operation of the highway.	Comment noted. Table 3.6-2 is included in the section titled "Post-construction Effects to Groundwater Quality," and therefore presents values during highway operation.
City of Austin	Referenced Text: "Table 3.6-3"- This table demonstrates the increases in pollutants other than TSS for highway runoff. Since Texas Commission on Environmental Quality pond sizing procedures are only geared towards TSS removal, and the stated design goal is to exceed 90% TSS load reduction, it should be quantified how much additional loading will occur for the other pollutants of concern, particularly Total Phosphorus, Total Nitrogen, Oil and Grease, COD, e coli and Zinc or Lead. As noted in Table 5.1-1 and in the City of Austin Environmental Criteria Manual, 1.6.5 C, the removal efficiency of BMPs for constituents other than TSS is significantly lower than TSS removal. And in the case of Nitrites and Nitrates, a local study (Barrett, 2010) showed the pond to export Nitrites and Nitrate. Please quantify the effective loading of all the pollutants shown in Table 5.1-1. At the very least, quantify loading for Total Phosphorus, Total Nitrogen and Lead. Since Texas Commission on Environmental Quality equations were not designed for load removal for pollutants other than TSS, please cite the methodology used to quantify loading, preferably a method that explicitly accounts for actual pond volume, contributing drainage area, orifice size and drawdown time and effluent concentrations on an average annual basis.	See Table 3.6-7 in the Draft EIS for pollutant removal data for a variety of constituents. Concerning the export of Nitrites and Nitrates, see footnote 6 in the table that addresses this comment. E-coli data is not available but we do know how much total coliform, fecal coliform and fecal streptococcus are present in highway runoff. Total suspended solids is a regulatory constituent, and the effects of total suspended solids removal on other constituents is discussed in the Draft EIS/Final EIS.
City of Austin	What is the removal mechanism for dissolved pollutants in porous pavement? Dissolved contaminants that infiltrate thru the porous pavement will recharge the aquifer with minimal attenuation by soil.	Permeable Friction Course would be the first water quality control. Vegetative controls (Vegetative Filter Strips and grassy swales) and batch detention would provide additional treatment. Permeable Friction Course will be underlain by impervious layers. No direct recharge will be possible through the PermeableFriction Course. Also, Permeable Friction Course benefits water quality by reducing pollutant loading to the roadway surface, as discussed in Appendix H of the Final EIS. The majority of the roadway will be designed to allow for spill capture.
City of Austin	The DEIS cites Driscoll et al. 1990 as stating that surrounding land use is the most important general factor influencing highway pollutant loads. No such analysis exists in the cited reference supporting that claim. The report specifically states "The site characteristics used in the evaluation procedure include information on drainage areas, area rainfall characteristics, the concentrations of pollutants in the highway runoff, the fraction of the total pollutant concentration that is in soluble form, and finally, the target receiving water concentration (against which the concentration produced by the highway runoff will be compared)."	Driscoll, Shelley, and Strecker (1990b, page 87) states that "Surrounding land use is indicated by the results of this study to be the most important general factor that influences the level of pollutant loads in highway runoff." The level of analysis requested is not appropriate for this phase of project development. TxDOT is committed to meeting state of Texas water quality standards as administered by the Texas Commission on Environmental Quality's Edwards Aquifer Rules. As discussed in the Final EIS, water quality treatment measures that are designed to remove total suspended solids also indirectly remove other constituents that are associated with roadway runoff.

Organization	Verbatim Comment	Response
	That citation does include procedures for estimating the impact of highway runoff on water quality. Please follow the procedures outlined in this reference for evaluating the potential impact to groundwater and surface water resources in the study area.	
City of Austin	No quantitative analysis is presented to validate the claim that there will be minimal impacts on the quantity and quality of groundwater recharge from the proposed project. Comparisons of percent impervious cover for the proposed project (which is higher than allowed by City of Austin Save Our Springs Ordinance requirements) to watershed levels of impervious cover are not an appropriate method to evaluate localized impacts to receiving waters and do not evaluate cumulative effects of impervious cover addition. The DEIS specifically states "While the general percentage of impervious cover within a watershed can be helpful in estimating effects of urbanization on the watershed, a more thorough examination of where impervious cover occurs and what other threats to water quality are present is necessary to fully determine effects on aquatic ecosystems (USFWS, 2013)."	As designed, the best management practices proposed for this project will exceed Texas water quality standards as administered by the Texas Commission on Environmental Quality's Edwards Aquifer Rules. As discussed in the Final EIS, water quality treatment measures that are designed to remove total suspended solids also indirectly remove other constituents that are associated with roadway runoff. Regarding water quantity, the proposed project would maintain the amount of water in the state-owned right-of-way. The project would divert some water to water quality ponds for treatment; treated water would then outfall to the creeks in the project area and have the potential to recharge the Edwards Aquifer within the streambeds.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. These protected lands are not expected to significantly contribute to pollutants in stormwater runoff.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	The DEIS mentions in several places the high removal rates of PFC pavement, particularly of TSS, but there is no discussion of the effective life of the pavement regarding TSS removal.	Permeable Friction Course life is addressed in the Biological Evaluation. Appropriate maintenance and replacement schedules will be developed as part of TxDOT's commitment to water quality protection. Replacement frequency is based on drawdown time threshold in TEX246-F (referenced in Biological Evaluation) typically 10 years.
City of Austin	The current Texas Commission on Environmental Quality guidance for compliance with the Edwards Aquifer rules notes that PFC pavement is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed PFC pavement will	No direct recharge will be possible through the Permeable Friction Course. Infiltration via pervious concrete is not proposed as the road will be impervious. Rather a porous overlay is proposed that will filter stormwater. The subgrade of the pavement will be impervious.

Organization	Verbatim Comment	Response
	comply with Texas Commission on Environmental Quality regulations and guidance.	
City of Austin	Cite the specific percent removal estimates of the proposed project BMPs for each of the pollutants (and concentrations) listed in Table 3.6-3, or otherwise provide references that TSS is a more protective surrogate than any of these pollutants such that only TSS removal needs to be calculated to evaluate impacts.	Total suspended solids is the constituent of regulatory focus, and information regarding the establishment of total suspended solids as such is provided in the Final EIS. Furthermore, effects of total suspended removal on other constituents of concern are discussed in the Draft EIS/Final EIS. Final calculations are provided in terms of total suspended solids in accordance with current regulatory framework.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. All ten pollutants were observed in runoff from the undeveloped watersheds, and six of these pollutants (including TSS and total organic carbon) were found at concentrations that were not significantly different from concentrations in runoff from developed watersheds. This study demonstrated that there are naturally occurring pollutants that may naturally recharge into the Edwards Aquifer through stormwater.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	The DEIS discusses the proposed project in terms of impervious cover the project would create but compares that value to the impervious cover in entire watersheds. As a rule, the amount of impervious cover for a construction project is a percentage of the land as net site area the project is constructed on. In this case, the only comparison of impervious cover should be the pavement or other impervious surfaces within the state-owned ROW (referenced as around 24%). It is not clear if that percentage includes water quality ponds and other impervious surfaces.	Net site area is not used to calculate impervious cover. Rather, gross site area (without subtracting floodplains or other natural buffers) is used to calculate impervious cover. Water quality ponds would have impervious liners but their area is not counted as impervious for the purposes of the calculation.
City of Austin	Are the percent removal efficiencies for the proposed BMPs applicable for both construction and post-construction activities?	There is no performance standard for temporary best management practices. A rigorous temporary best management practice design will be performed as the project moves forward. As discussed in the Technical Work Group, as many permanent best management practices as possible would be constructed early on and used during the construction phase. Water quality ponds would allow for consistent removal efficiency, regardless of construction phase.

Organization	Verbatim Comment	Response
City of Austin	The pollutant removal calculations used for TSS do not consider any bypass flow or bypass load. What is the load of TSS that will be bypassed around the proposed BMPs? What design storm was used to evaluate the percent removal of BMPs?	Current computations provide both existing and by-pass loads. According to the total suspended solids Removal Computations, the existing load is approximately 18,182 lbs. The by-pass load after all proposed best management practices are in place is approximately 14,075 lbs. Flow-through best management practices are designed and evaluated based on a 1.1 inch/hour event whereas "Capture and Treat" devices which are proposed for this project use a rainfall depth of 4" which is roughly equivalent to a 2 year design storm for Travis County.
City of Austin	"…The proposed roadway would be constructed on fill to limit natural ground disturbance…" Although fill does not necessarily disturb soil per se, large amounts of fill as proposed can significantly alter natural groundwater and surface hydrology. This is another example of imported materials that have the potential to introduce invasive species. The DEIS should provide a more thorough evaluation of the impacts of fill placement.	The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of sensitive karst features, based on the 2014 karst feature survey. As discussed in the Biological Evaluation, the surface drainage basins of three sensitive features (F-55, F-23 [Hat Sink], and Flint Ridge Cave) would be directly impacted by the proposed roadway. Compensating drainage area s would be graded to maintain flow to these sensitive features. Therefore, no loss of recharge volume is anticipated. Appendix H --Water Quality and Aquatic Resource Protection Technical Report and Sections 3.6 and 3.7 of the Final EIS provide discussions of how the proposed project would maintain the size of surface drainage areas to karst features and recharge. Attachment 3 in Appendix H includes figures illustrating protective measures at sensitive karst features, as well as measures taken to ensure that the size of surface drainage areas at these features is maintained.
City of Austin	Referenced Text: "In accordance with the Edwards Aquifer Rules regulating construction over the Recharge Zone, permanent BMPs and measures must be designed, constructed, operated, and maintained to ensure that 80 percent of the incremental increase in the annual mass loading of TSS from the site caused by the proposed project would be removed." - Previous discussions with TxDOT and CTRMA indicated that the agencies would be committed to implementing non-degradation standards for construction and post construction water quality. Previous conversations with the Technical Working Group defined the goal of nondegradation as no net increase in the average annual loading of pollutants as regulated in the City of Austin's Save our Springs Ordinance. The report does not acknowledge this commitment and instead states that Edwards Aquifer Rules are used to demonstrate water quality impacts, but that 90% TSS removal rates would be used instead of 80%. There is no statement of design goals for the control of the other stormwater pollutants that are acknowledge to be generated from this project. Please reconfirm commitment to non-degradation standards.	According to the Technical Work Group meeting notes, as stated, the permanent water quality controls will exceed the Texas Commission on Environmental Quality standard. The project will commit to meeting the current regulatory requirements and will exceed these in several instances.

Organization	Verbatim Comment	Response
City of Austin	Explain what "batch" detention ponds are.	Batch detention water quality ponds act like wet ponds and have better nutrient removal than a sand filter (Middleton and Barrett, 2008, Landphair et al., 2000).
City of Austin	Texas Commission on Environmental Quality 2012 Guidance for permeable friction course states that the 90% removal of TSS is only applicable when posted speeds are more than 50 mph. What is the posted speed of the roadway?	The posted speed of the roadway would be determined after the road is constructed. However, the posted speeds of other roadways in this area (MoPac, existing SH 45, FM 1626) all exceed 55 mph. Therefore, it is anticipated that the proposed project's speed limit would exceed 55 mph.
City of Austin	Texas Commission on Environmental Quality 2012 Guidance as cited specifies that permeable friction pavement requires "milling and replacement of the overlay at regular intervals, which entails significant expense." What is the planned maintenance program for the permeable friction course, and what is the planned replacement frequency for the proposed permeable friction course to ensure continued removal of pollutants over time? Are there plans for monitoring the performance of the pavement for water quality treatment and defining triggers for maintenance of the pavement?	Permeable Friction Course issue is addressed in Biological Evaluation. Replacement frequency is based on drawdown time threshold in TEX246-F (referenced in Biological Evaluation) typically 10 years.
City of Austin	Texas Commission on Environmental Quality 2012 Guidance as cited specifies that sand may not be used for de-icing, but de-icing salts may be used. How will the highway be operated during freezing conditions? Have de-icing salts and other chemicals been evaluated for potential surface water and groundwater impacts from the proposed project?	TxDOT has standard deicing practices it uses in inclement weather, typically involving application of a deicer prior to freezing conditions. TxDOT standard practice regarding deicing is only to deice bridges, which would not be constructed of Permeable Friction Course pavement. All runoff from the bridges would be treated through proposed best management practices before being released to creeks.
City of Austin	Assumptions used for background level TSS on undeveloped WQPL are questionable and should be explained.	Citations for background loading calculations are provided in Section 3.6.2 of the Final EIS.
City of Austin	Provide examples of greenfield road projects that have reduced TSS and other pollutant loads over undeveloped existing conditions to validate the claim that the proposed project will improve water quality. Also, it is not clear that the pollutant load analysis includes bypassed stormwater volumes in pollutant discharge analysis. Bypassed volumes are probably the most significant source of pollutant discharges from the project.	The project would be a unique example of the application of best management practices and regional regulations to meet the stated goal. The total suspended solids computations prepared for this project are comprehensive and take into consideration all total suspended solids load generated and all total suspended solids remaining for both existing and proposed conditions. The existing total suspended solids load generated is approximately 18,182 lbs. and the load generated after the project is approximately 14,075 lbs. with the currently proposed best management practices (designed for max of 4" rainfall). Any additional bypass volume analysis (rainfall more than 4") beyond that which is required for Texas Commission on Environmental Quality water quality regulations is not required.
City of Austin	The DEIS discusses that SH45 will have steep cross slopes which it anticipates would allow some stormwater to runoff the PFC surface thus reducing its effectiveness in TSS removal yet the DEIS touts the use of PFC pavement on page 145 without mentioning this limitation. The DEIS should evaluate the decreased effectiveness of cross slopes and adjust project efficiencies accordingly.	As stated in section 3.6.2, "Permeable Friction Course would be used in most areas but were not included in total suspended solids calculations where steep cross slopes would occur."

Organization	Verbatim Comment	Response
City of Austin	TSS is reported to be captured in pore spaces of the PFC pavement, however, at some point in time all pore spaces MUST be occupied thus rejecting any additional TSS. This means the TSS reduction associated with the PFC pavement has a limited lifespan of effectiveness and TSS will be expected to increase once this occurs. TSS is supposed to be removed for the lifetime of the roadway and this would appear to be in conflict with that requirement.	Appropriate maintenance and replacement schedules will be developed as part of TxDOT's commitment to water quality protection.
City of Austin	Percent removal for constituents other than TSS are frequently lower than 90% as shown in Table 3.6-7. No pollutant load calculations from the project are shown for constituents other than TSS. As such, the statement that "the analyses indicate that the proposed project would have a negligible impact on groundwater quality in the Barton Springs segment of the Edwards Aquifer" is not valid. Calculate loads for all constituents listed in Table 3.6-7 from the proposed project, with and without the proposed BMPs, and compare to aquatic life criteria for the protection of surface water and groundwater biological resources including the Barton Springs Salamander.	Total suspended solids is a regulated constituent under the Edwards Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final EIS (Appendix H--Water Quality and Aquatic Resource Protection Technical Report). TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs salamander would not occur. Further discussion is provided in the Biological Evaluation, which is included as an attachment to the Final EIS.
City of Austin	Table 3.6-7 shows pollutant removal estimates lower (less protective) than TSS for many stormwater constituents. As such, use of TSS as a design surrogate is not adequate to support claims that BMPs will mitigate impacts from the proposed project.	Total suspended solids is a regulated constituent under the Edwards Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final EIS (Appendix H--Water Quality and Aquatic Resource Protection Technical Report). TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements. Erosion control devices are inspected weekly on a day established by contractor and environmental compliance manager. Maintenance will be performed in a timeframe established in the contract, not to exceed 48 hours after notification.
City of Austin	No specifics are provided on how impervious cover is calculated. Does this include: roadway surface, shoulders, WQ ponds and facilities, diversion berms for Flint Ridge Cave, bentonite cap for Flint Ridge Cave?	Impervious cover calculations included the roadway surface and shoulders and the shared use path. Impervious cover is defined on page 140 of the Draft EIS. The impervious cover calculations were calculated based on the placement of surfaces applied to the ground that are not penetrated by water. Water quality ponds would have impervious liners but their areas are not typically counted towards the amount of impervious cover, and were not counted in these calculations. The berm and clay liners are no longer part of the proposed schematic in the Final EIS.

Organization	Verbatim Comment	Response
City of Austin	The evaluation generalizes impacts in the recharge and transition zones, but fails to identify this site as one of the most karst rich, and therefore, one of the most recharge intense sites in all of the Barton Springs Zone. It fails to factor the relative importance of this site compared to other less significant recharge sites.	The Draft EIS acknowledges that many surficial karst features are present within the study area and that these features can allow for rapid recharge to the underlying Edwards Aquifer. The presence of sensitive karst features and potential for aquifer recharge to occur in the state-owned right-of-way are discussed further in Section 3.3 of the Final Environmental Impact Statement and in the following technical reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report.
City of Austin	Temporary and permanent loss of recharge will occur as a result of the 4 karst features permanently filled as stated, or with loss of surface drainage area, or with loss of subsurface catchment area as a result of the project. What volume of recharge will be lost a result of the project to ensure that no take of endangered salamander species occurs?	The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of sensitive karst features, based on the 2014 karst feature survey. As discussed in the Biological Evaluation, the surface drainage basins of three sensitive features (F-55, F-23 [Hat Sink], and Flint Ridge Cave) would be directly impacted by the proposed roadway. Compensating drainage area s would be graded to maintain flow to these sensitive features. Therefore, no loss of recharge volume is anticipated. No runoff that falls within the Recharge Zone is being removed from the project or the Recharge Zone so no loss of recharge is expected.
City of Austin	Comparison of impervious cover from the proposed project to impervious cover of the entire recharge zone is not an appropriate method to validate a lack of impacts. What is the volume of infiltration that will be added as a result of the water quality BMPs as stated? Will water quality ponds be unlined and allow infiltration?	The Draft EIS presented impervious cover extent at various scales to describe the proposed project within those contexts. Water quality ponds would be lined. Only qualitative analysis of best management practice recharge effects is currently available.
City of Austin	The Texas Commission on Environmental Quality Edwards Aquifer Rules are not intended to be "non-degradation" and simply following them does not result in non-degradation.	The project will commit to meeting the current regulatory requirements and will exceed these in several instances.
City of Austin	Clarify where the 17.2 acres of impervious cover within state-owned ROW are. This value is not consistent with the values presented on page 147 and creates confusion as to what is being referred to.	Clarification was added in Final EIS.
City of Austin	No complete and valid assessment of the impact of the project can be completed without a completed karst survey and geological assessment.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas and the Geologic Assessment. These reports have been appended to the Final Environmental Impact Statement in Appendix M and Appendix O, respectively.
City of Austin	The DEIS should supply data to support the statement that "the retention of stormwater runoff and gradual release form water quality ponds may allow for greater recharge to the Edwards Aquifer" or remove the unsupported statement.	This is a qualitative statement based on the amount of stream flow that is recharged through particular features and is based on the observation that storm pulses result in a lower percent of streamflow being available for recharge. However, if the flow duration was extended, as would be the case with the application of the proposed best management practices, recharge potential would be increased.

Organization	Verbatim Comment	Response
City of Austin	The DEIS states that BMPs would maintain the flow to naturally occurring sensitive features to the extent practicable but then only mentions that the amount of (surface) water draining to Flint Ridge would be maintained. Since the DEIS does not contain the most recent karst data impacts on surface drainage to other karst features cannot be determined. However, COA calculations of the drainage areas cutoff to other karst features indicate a significant reduction in area draining to features such as Hat Sink, Jubilee Sink, F29 and F136.	The drainage areas to all sensitive karst features have been identified. Flint Ridge Cave is the most important karst feature adjacent to the project so a great deal of attention was given to maintaining its surface drainage area. Drainage details are now available that clearly show the sensitive karst features mentioned, their associated drainage areas and how the project would maintain the existing drainage area. No reduction would occur to any sensitive karst feature. Additional information pertaining to sensitive features and associated protection measures are provided in Section 3.7 of the Final EIS and in Appendix H. Information on sensitive karst features in the state-owned right-of-way and changes to the proposed roadway alignment are discussed in Section 3.3.
City of Austin	In addition, the DEIS does not address the potential loss of recharge from infiltrating rainwater to the karst groundwater system. A COA-funded study is currently underway to help define the subsurface catchment of Flint Ridge Cave.	A sub-surface map dated December of 1999 (Veni) has been utilized on this project to assign protective buffer areas around Flint Ridge Cave. The limits of construction for this project do not encroach within the established buffer. However, this project will not remove runoff from the Recharge Zone so no loss of recharge is expected.
City of Austin	The DEIS does not address the fact that a portion of the roadway overlies the Flint Ridge Cave system and what potential impacts that might have.	The subsurface footprint of Flint Ridge Cave is depicted in updated figures (3.7-7 and 4.2-1). Recharge potential is addressed in Section 3.6. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas technical report
City of Austin	States that recharge will still occur after treatment. Previous text describes that runoff in some cases will be treated, then diverted off site to avoid sensitive karst. Will recharge be contributing to the same flow paths as it would be in the no-build alternative?	Some flow paths would be modified, but water would not be exported from the recharge zone by currently proposed best management practices.
City of Austin	States that some recharge will be enhanced because BMPs will slow velocities. Fails to consider whether installation will destroy discrete recharge sites and negatively impact recharge.	These separate issues are discussed in the Final EIS in Section 3.6.
City of Austin	States that stormwater detention will hold more water onsite to increase opportunity for recharge. No data is provided to compare detention volumes to water holding capacity in the 4' deep soil profile that will be negatively impacted by soil compaction, impervious cover, and diversion of flows.	This is a qualitative statement based on the amount of stream flow that is recharged through particular features and is based on the observation that storm pulses result in a lower percent of streamflow being available for recharge. However, if the flow duration was extended, as would be the case with the application of the proposed best management practices, recharge potential would be increased.
City of Austin	Encroachment of impervious cover over the subsurface catchment area of karst features like Flint Ridge Cave will decrease recharge to these features and the aquifer. Specify the volume of recharge lost from diffuse infiltration to Flint Ridge Cave as a result of the project.	The roadway alignment has been relocated such that only 0.7 acres of watershed is being removed from Flint Ridge Cave. However, 0.7 acres of natural watershed will be re-directed to Flint Ridge Cave to compensate for this loss resulting in no loss of surface drainage to Flint Ridge Cave. No runoff from the Recharge Zone is being relocated offsite or away from the Recharge Zone so no loss to recharge is expected.
City of Austin	The potential loss of recharge due to sealing seven karst features should be addressed in the DEIS and not another document (sent to Texas Commission on Environmental Quality) that the general public will not be able to review.	The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of sensitive karst features, based on the 2014 karst feature survey. As discussed in the Biological Evaluation, the surface drainage basins of three sensitive features (F-55, F-23 [Hat Sink], and Flint Ridge Cave) would be directly impacted by the proposed roadway. Water from compensating drainage areas would be diverted to maintain flow to these sensitive features. Therefore, no loss of recharge volume is anticipated.

Organization	Verbatim Comment	Response
City of Austin	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft. contour intervals (versus 2 ft. used by the TxDOT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the DEIS.	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed.
City of Austin	The DEIS states that approximately 5.6 acres of the Flint Ridge surface drainage area will be covered with impervious cover but Figure4.2.1 on page H-29 indicates that 5.6 acres will be removed from the Flint Ridge drainage area but not necessarily covered with impervious cover. Clarification is needed.	The proposed alignment has changed in response to public comment and new information made available in the current Geologic Assessment. As stated in Section 3.6.2 of the Final EIS, the build alternative "would result in approximately 1.3 percent (approximately 0.7 out of approximately 55.5 acres) of the surface catchment basin being covered by impervious surfaces (see Figure 3.7-7 in Section 3.7)."

Organization	Verbatim Comment	Response
City of Austin	"…The Build Alternative would be located near Flint Ridge Cave and would result in approximately 13 percent (approximately 5.6 out of approximately 43.8 acres) of the surface catchment basin being covered by impervious surfaces… " TxDOT's figure for surface runoff, (43.8 acres) does not match WP's figure of 57.8 based on LIDAR aerial survey and ground truthing immediately after the major flood event of October 31, 2013	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed. The proposed alignment has changed in response to public comment and new information made available in the current Geologic Assessment. As stated in Section 3.6.2 of the Final EIS, the build alternative "would result in approximately 1.3 percent (approximately 0.7 out of approximately 55.5 acres) of the surface catchment basin being covered by impervious surfaces (see Figure 3.7-7 in Section 3.7)."
City of Austin	"The limits of the berm would extend far enough beyond the cave watershed to ensure that roadway runoff would not enter the cave. To prevent the possible infiltration of untreated roadway stormwater runoff through the soil matrix into Flint Ridge Cave, a bentonite (clay) liner would be installed up-gradient from and adjacent to the berm." Since we do not know where the subsurface catchment area is, it's hard to say if this would work, and if so, then it would alter the hydrological regime further drying out the cave, thus negatively impacting the cave fauna	The latest design of the roadway has removed the berm and restored the surface catchment basin of Flint Ridge Cave. Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices.
City of Austin	No design or data is provided to verify their calculation of impact to Flint Ridge Cave.	Figure 3.7-7 provides a graphic illustration of the project in relation to the Flint Ridge Cave surface and subsurface drainage areas.
City of Austin	Is diversion berm counted as impervious cover (2900" X 17'(est.) 1 acre)? Is bentonite Cap (perhaps another acre) counted? Is impervious cover from stormwater ponds and hazardous material pollution traps counted. No data is provided.	The berm has been removed from consideration in the latest alignment which was developed in response to public comment and the 2014 Geologic Assessment.

Organization	Verbatim Comment	Response
City of Austin	States that impacts to recharge by destruction of karst will be considered as part of geological assessment. This document previously stated that assessment is not part of this DEIS. There will be no opportunity for public review and comment on this data and the conclusions drawn from it.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final Environmental Impact Statement and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. The 2014 Geologic Assessment is also summarized in the Final EIS and the Biological Evaluation.
City of Austin	No quantitative analysis validating the preservation of aquifer recharge quality or quantity is presented. No consideration of pollutants other than TSS is presented in evaluating impacts to Barton Springs. Thus, the assertion that Barton Springs will be improved by SH45 SW is not supported. What is the volume of stormwater that will be recharged from the proposed project area, since that is qualitatively compared to Barton Springs discharge?	The complexities of recharge efficiency and the resulting variation in recharge rates on both upland and streambed areas prevents precise quantification of recharge impacts. The design team has proceeded with project development with the intent to protect the quality and quantity of potentially recharging water, and it could be argued that in some instances rechargeable water quantity and quality would be increased.
City of Austin	How is the distance of the project relative to Barton Springs relevant? What are the attenuation of the contaminants listed in Table 3.6-7 inside the Edwards Aquifer that would support this statement?	The distance of the project to Barton Springs is included to provide context to the reader. The text goes on to discuss the flow direction from the proposed project site toward the springs. The preceding paragraph provides additional information on flowpaths and recharge relative to the study area and Barton Springs. The intent of Table 3.6-7 is to provide information regarding pollutant removal efficiencies associated with four different types of water quality protection measures that would be included in the SH 45SW design. The level of treatment associated with the proposed project would exceed the Texas Commission on Environmental Quality's requirements for water quality treatment under the Edwards Aquifer Rules. A discussion of potential attenuation of contaminants is included in the Biological Evaluation of SH 45SW.
City of Austin	States no springs mapped in project area. A significant spring exists upstream of the dam on Bear Creek on WQPL Tabor tract. Also a significant spring on Bear Creek on Marbridge Ranch exists at southern end of study area. These spring sites are apparent on the Signal Hill and Oak Hill USGS 7.5 minute quads.	Spring data has been updated in Final EIS based on Texas Water Development Board and Barton Springs/Edwards Aquifer Conservation District databases.
City of Austin	Describes relatively small amount of water recharging from the project area. Again fails to recognize that this has been considered one of the most recharge intense sites in all of the BS Zone.	The Project Team recognizes the karst nature of the corridor and the role it plays in recharging the Edwards Aquifer which is why great consideration has gone into establishing the roadway alignment and design details in such a manner as to prevent and/or substantially lessen the impact on any sensitive karst features and all existing ground within the SH 45 SW

Organization	Verbatim Comment	Response
		right-of-way. No impacts to recharge are expected because no naturally occurring runoff is being removed from the Recharge Zone.
City of Austin	Use pumping numbers from the BSEACD Habitat Conservation Plan draft.	Change made in Final EIS.
City of Austin	Water stored in ponds is subject to evaporation. Evaluate evaporative losses from ponds to validate the conclusion that there will be no loss of recharge to the aquifer.	Evaporative losses would be negligible for individual rainfall events. In addition evaporative losses occur naturally and are assumed in the flow calculations. Potential losses are addressed in the Biological Evaluation.
City of Austin	The impacts to groundwater wells cannot be evaluated without evaluating all pollutants of concern, not just TSS, as the pollutant removals of other contaminants are not equivalent to TSS as stated in Table 3.6-7. Pollutant removal rates of constituents other than TSS would not be 90% over the recharge zone as stated. Additionally, hazardous material spills will impact groundwater well users.	Table 5.1-1 in Appendix H - Water Quality Technical Report provides reported removal efficiencies for other pollutants present in roadway runoff. According to TxDOT's review of the occurrence and statistics of hazardous material spill incidents from mobile sources along Texas highways, hazardous material spills large enough to impact private water wells are rare. State spill response rules require media notification in the event of a large spill (90 percent of all spill incidents are 820 gallons or less). The intent of these rules is to alert individuals about the potential for contamination.
City of Austin	The DEIS should present data on how many public water supply wells are downgradient from the project area. Tracing has already shown that water recharging in the general project area can rapidly reach wells miles downgradient of the project area.	Figure 3.6-1 provides locations of water wells in the study area, including public water supply wells. As impacts to groundwater quality and quantity are expected to be negligible due to the 48.9 acres of proposed impervious cover over the Recharge Zone and proposed water quality protection measures and best management practices, no impacts to public water supply wells are anticipated.
City of Austin	The project should not rely on dilution of water quality impacts from the project.	The design team is relying on committing to high efficiency water quality best management practices and their application in series over as much of the project area as practicable. The discussion of water quality is presented within a thorough representation of the aquifer system which includes existing stored water which would result in a diluting effect.
City of Austin	The current Texas Commission on Environmental Quality guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with Texas Commission on Environmental Quality regulations and guidance.	Infiltration via pervious concrete is not proposed as the road would be impervious. Rather a porous overlay is proposed that would filter stormwater. The subgrade of the pavement would be impervious.
City of Austin	The Texas Register 1998 is not a valid citation to support the statement that "TSS is a constituent of stormwater that is often measured as an indicator of overall water quality and is a focus of water quality regulations and performance standards in part because of its correlation to other pollutants that occur as particles (it serves as a surrogate in calculating removal efficiencies), the tendency of hydrophobic pollutants to adsorb to clay and silt particles, and the positive effects that TSS removal has on the	The Texas Register was included in the discussion to represent the state of scientific debate that led to the adoption of total suspended solids as the constituent of regulatory focus.

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	removal of other constituent pollutants". That citation was a comment made by TxDOT on the proposed rules. Please provide peer-reviewed references to support each of those contentions. Related comments on the same page of the Texas Register state "[TSS] works well for pollutants that adhere to soil particles, it is a poor measure of the effectiveness of controls to remove nutrients."	
City of Austin	What is the calculated nutrient load to surface water as a result of the proposed project? Dry stormwater controls have limited effectiveness at removing nutrients, with total phosphorus and total nitrogen removal estimated to be 13 to 40 and 10 to 35 percent, respectively. (Stanley, D.W. 1996. Pollutant removal by a stormwater dry detention pond. Water Environment Research 68(6):1076-1083)	Loads for each constituent were not calculated. A discussion of the effects of various best management practices on constituent loading is included in Appendix H.
City of Austin	Onion Creek and Bear Creek water quality conditions are summarized in these publications, which are not included in the DEIS: http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=203077 http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=186308	City of Austin Environmental Integrity Index reports were referenced in the discussion of the state and trends of each watershed in the study area. These discussions are included in Appendices H, J and I.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable.	It is unclear what the comment is referring to when it mentions “US Environmental Protection Agency guidance and case law.” The term “greatest extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	The text states that "a full-time ECM WOULD ensure strict adherence to environmental commitments..." The text should be reworded to be more affirmative to the commitment of TxDOT and CTRMA to strictly adhere to environmental commitments by rewording to read "a full-time ECM WILL ensure strict adherence...."	The use of "would" acknowledges the possibility that the No Build alternative could be selected.
City of Austin	Will the permanent BMPs be installed prior to earthmoving on this project?	Earth moving may be part of site preparation in advance of structural control construction. However, the commitment remains to install structural controls as early as practicable and to implement additional temporary best management practices to minimize erosion and prevent sedimentation (Section 3.6.2, 3.7.2, 3.7.3, Appendix H).

Organization	Verbatim Comment	Response
City of Austin	Referenced Text: "The proposed aquatic resource protection measures would, if fully implemented, result in negligible impacts to surface and groundwater quality during construction. Staged construction, limited soil disturbance and the preservation of natural vegetation would minimize erosion and decrease the likelihood of sediment discharges." - This statement lacks any supporting reference and is contradicted by the current performance of highway construction projects in Austin, Texas. The statements are misleading at best and closer to false. The soil disturbance will not be limited within the LOC, it will be almost complete, and there will most likely be very little if any vegetation preserved in the LOC, therefore resulting in significant erosion and an increased likelihood of sediment discharges. This paragraph should be replaced with a realistic description of the how construction is performed and an acknowledgement that there is a high probability of sediment discharges during construction.	Staged construction would limit the amount of soil disturbance and vegetation removed at any given time throughout construction. As the project progressed, best management practices would be installed that would reduce off-site sediment discharges until permanent stabilization measures were fully implemented.
City of Austin	Referenced Text: "These permanent BMPs would be installed as early as practicable during the construction phase of the proposed project to allow for the temporary detention and treatment of on-site stormwater. Ponds similar in design to those proposed have been shown to reduce TSS levels by 91 percent (Middleton et al., 2006) ." - The proposed sedimentation filtration ponds' performance of 91% removal does not consider construction phase influent concentrations in the removal. At the Technical Work Group meeting at TxDOT on July 25, Carlos Swonke stated that the >90% TSS removal applies equally to construction phase as well as post construction phase. First, % removal is an inappropriate and outdated methodology to characterize BMP performance. The significant increase in TSS concentration that would flow into a BMP will result in a very high concentration-3000 mg/l ("An evaluation of geotextiles for temporary sediment control. Barrett et al, WERF, 1998) - of TSS into any BMP and subsequent discharge load of TSS even after 90% removal, assuming the filtration media is not clogged. As noted in Texas Commission on Environmental Quality Edwards Aquifer technical guidance, typical influent concentration for stormwater into a BMP after construction is 170 mg/l. Please change the description to characterize BMP performance based upon influent/effluent concentration and describe the dichotomy between influent and effluent concentrations for construction and post construction phases. Please refer to the following reference: "An evaluation of geotextiles for temporary sediment control." Barrett et al., WERF,	Water quality ponds will allow for consistent removal efficiency, regardless of construction phase. Best management practices efficiency discussions were framed in the context of current regulatory guidance. Geotextiles may be one of the many best management practices that would be used to protect water quality. Should best management practices deficiencies be found, the Environmental Compliance Management Plan will provide for appropriate response through adaptive management to develop a remedy.

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	1998 page283-290). Second, published removal efficiency of a BMP (whether it is temporary or permanent) is not sufficient demonstration that the removal efficiency will result a certain load being captured. Without preliminary layout of a system of construction phase BMPs, it is not defensible to claim a load reduction or system removal based upon the efficiency of one or more stand-alone BMPs. Additionally, the effluent concentration method should be used to characterize load reductions. Please use 500 mg/l TSS (Barrett et al., 1998) as the published effluent concentration for silt fences when performing load reduction calculations. Please provide appropriate reference for effluent concentrations from other BMPs for the load reduction calculations. Please provide quantification for a theoretical Erosion & Sedimentation plan that: a) demonstrates that 90% of the TSS load generated during construction will be captured by the suite of BMPs; and b) based on the loads that will be generated and leave the site during construction, quantify the effluent concentration of TSS from each BMP , quantify the effluent concentration for the runoff that bypasses the BMPs and then quantify the TSS load in lbs. per year that will leave the site and compare to undeveloped conditions.	
City of Austin	Referenced Text: "Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable." - This language is overly optimistic. Avoiding off-site discharge is highly unlikely and minimizing sediment discharges has not been demonstrated on area TxDOT projects. All case studies of current highway construction in association with TxDOT demonstrate that the aforementioned approaches are not regularly practiced and that off-site discharge usually occurs. COA has a catalog of photos from 2013 and 2014 to document current state of practice on area state roadways.	Comment noted.
City of Austin	"Design goals" are mentioned in this section, but nowhere in the DEIS are all of the "Design Goals" explicitly enumerated. Please list and describe all of the design goals of the project.	This text has been removed from the Final EIS. Appendix H - The Water Quality Technical Report includes reference to three specific goals relating to impact avoidance, minimization, and mitigation including 1) installation of water quality ponds, 2) karst impact avoidance, and 3) Maximizing Hazardous Materials Trap detainment volumes. The use of the term "goal" is used to illustrate specific measures being taken to achieve the "Other Project-Related Goals" listed in Section 1.5 of the Final EIS, stating that "one of TxDOT's goals would be to construct the proposed project in an environmentally sensitive manner that minimizes, to the maximum

Organization	Verbatim Comment	Response
		extent possible, the potential for impacts to the Edwards Aquifer from construction and operation of the roadway.
City of Austin	Pollutant loads bypassing goals are not calculated. What pollutant load will bypass each of the series of stormwater BMPs?	Detailed consideration of efficiencies of best management practices in series (and inversely implied, the bypass load) are presented in Appendix H.
City of Austin	TSS values for Onion and Bear Creek are concentrations, not loads. Evaluation of TSS monitoring values available from the LCRA water quality website for Onion Creek below Bear Creek indicate that the calculated 12.8 mg/L TSS concentration from the proposed project would be equivalent to the 95.5 percentile of data. Only one of the 13 monitoring points exceeded 4 mg/L. The reported 23 mg/L is an outlier. The statement that the "The expected 12.8 mg/L TSS concentration shown in Table 3.6-6 is well within the typical range of surface water in streams near the state-owned ROW" is not supported by this data and should be removed.	The values were presented as a range of natural variation in pollutant concentrations and are legitimate as such.
City of Austin	COA 2006 reports event mean concentrations for stormwater runoff. The statement that "recommended that an average mean concentration of 153.7 mg/L be used to represent the mean watershed TSS concentration regardless of impervious cover or development condition (COA, 2006)." is not accurate. This is reflective of stormwater runoff concentrations of TSS citywide, not watershed mean concentrations. A more robust monitoring data set from the next upstream Onion Creek monitoring site, 12447, yields a median TSS value of 1.6 mg/L and a maximum value of 6.8 mg/L from the LCRA water quality webpage.	This statement was modified in the Final EIS to reflect that data were reflective of stormwater runoff concentrations of total suspended solids city-wide.
City of Austin	No assessment of nutrient pollutant loads are provided, or estimates of chloride or sulfate loads which are typically dissolved and poorly removed by sedimentation BMPs. As such, the statement "Based on the level of treatment expected for the proposed system of BMPs, water quality would not be degraded to a point that would jeopardize current use classifications as established by Texas Commission on Environmental Quality." is not valid and should be removed since no general use criteria are evaluated and no nutrient, dissolved oxygen or algae growth impacts are evaluated.	Sentence removed. Note that, while anticipated loads of specific nutrients were not calculated specifically for the proposed project, published data regarding pollutant removal efficiencies associated with various best management practices were presented in Table 3.6-7 of the Draft EIS.

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City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. A 2006 study by COA evaluating stormwater runoff quality and quantity from small watersheds in Austin showed no significant trends in TSS levels associated with impervious cover or development condition, and recommended that an average mean concentration of 153.7 mg/L be used to represent the mean watershed TSS concentration regardless of impervious cover or development condition (COA, 2006).	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	The City of Austin supports the prohibition on the use of pesticides (including herbicides) along the SH45 ROW. This prohibition should be stated in Appendix H and in the mitigation section (6).	TxDOT uses an integrated pest management approach to ensure healthy vegetative cover. TxDOT's pest management program addresses pest management issues. TxDOT conducted an environmental review of its pest management program (See Final Supplemental EIS for Roadside PMP). Vegetation management practices are operated according to TxDOT's Roadside Vegetation Management Manual. Separate manuals or guidelines are followed for herbicide operations, invasive species, and landscape inspection. TxDOT operates under a Memorandum of Understanding with the Texas Department of Agriculture to promote public safety, environmental protection, and the effective use of pesticides. Pesticides are defined by TxDOT as any chemical or biological agent that kills plant or animal pests, herbicides, insecticides, fungicides, rodenticides, etc. are all pesticides. TxDOT's roadside pest management program (PMP) addresses pest management issues. In general, pesticides are only used adjacent to the roadside. Pesticides would not be used within natural buffers protecting sensitive karst features.
City of Austin	Relationships between TSS and parameters of concern for endangered salamanders is not justification for use of TSS as the sole design surrogate since pollutant removal of other constituents is less than the stated removal of TSS, as shown in Table 3.6-8	Total suspended solids is a regulated constituent under the Edwards Aquifer Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final Environmental Impact Statement (Appendix H--Water Quality and Aquatic Resource Protection Technical Report).
City of Austin	Use of the word "would" makes it sound like TxDOT and CTRMA are conditional on abstaining from the use of pesticides and herbicides for maintenance. Should be changes to "will."	The use of "would" acknowledges the possibility that the No Build alternative could be selected.
City of Austin	The statement "Therefore, possible effects of heavy metal constituents would be reduced by the use of BMPs and further diminished by natural chemical processes." is not supported by the preceding text. The concentrations or loads of toxic metals from the proposed project has not been calculated, and thus cannot be evaluated in terms of potential impacts on aquatic life.	Table 3.6-7 in the Final EIS and Appendix H - Water Quality and Aquatic Resource Protection Technical Report provide quantitative information regarding pollutant removal efficiencies of proposed water quality protection measures.

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City of Austin	Sulfate would be contributed by the proposed project to adjacent surface waters, sulfate has direct detrimental impacts to aquatic life, and sulfate is assessed for general use in classified segments including Onion Creek. What is the pollutant load of sulfate from the proposed project to receiving surface waters?	No project-specific pollutant load for sulfate was calculated.
City of Austin	This section ignores impacts of changes in hydrology to aquatic life (see for example http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=196444). What are the impacts to the hydrology of the receiving water from the proposed project? Will the project result in any additional excess stream power in Bear Creek or other receiving waters?	The detention and slow release capabilities of the proposed water quality ponds would address the issue of intensified storm pulse typically associated with increased impervious cover.
City of Austin	The statement "and the chemical processes that limit the availability of heavy metals, the proposed project would not be expected to have a measureable effect on water quality-dependent sensitive aquatic resources such as the Barton Springs or Austin blind salamanders..." is not valid or supported by the analysis presented. Stating that high hardness precludes aquatic life impacts of heavy metals is not valid. Calculate the pollutant loads from the proposed project for metals and compare to aquatic life criteria, or remove this statement.	The statement is qualitative in nature and is supported by the previous discussion within Section 3.7.2.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. Sensitive features may serve as conduits to the aquifer below or may serve as habitat to troglobitic species. In each regard, the quality and quantity of the water that reaches these features would be protected to the greatest extent practicable to ensure that the aquifer's water and the potential habitat are protected.	It is unclear what the comment is referring to when it mentions "US Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. The risk of harm to the Barton Springs salamander from potential hazardous material spills associated with the proposed SH 45SW would be reduced to insignificant levels by the capture and detainment capabilities of the proposed HMTs.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact

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		on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge.	It is unclear what the comment is referring to when it mentions "US Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	No discussion of revegetation specifications or methods for disturbed areas is presented. All disturbed areas should be revegetated with species native to the area. The City recommends City of Austin standards specification 609s for revegetation or specify the method that will be used	Disturbed areas would be re-vegetated with TxDOT native seed mix (see Section 6.6.1 of Final EIS).
City of Austin	Describe the maintenance procedures to be used for the BMPs during construction and post-construction operation.	Erosion control devices are inspected weekly on a day established by contractor and environmental compliance manager. Maintenance will be performed in a timeframe established in the contract, not to exceed 48 hours after notification.
City of Austin	Describe environmental monitoring programs that would be used to validate the performance of the proposed BMPs and to ensure no adverse impacts occur as a result of the proposed project. Share monitoring results on a regular basis with the City of Austin.	TxDOT will follow Texas Commission on Environmental Quality rules on monitoring best management practice performance
City of Austin	How will the effectiveness of BMPS for removing TSS be monitored over time? What is the expected maintenance interval for the BMPs proposed for this project? What actions will be taken if effectiveness is less than 90%?	TxDOT will follow Texas Commission on Environmental Quality rules on monitoring best management practice performance
City of Austin	The Texas Commission on Environmental Quality 2007 Edwards Rules Optional Enhanced Measures state that streams draining more than 640 acres should have buffers of 300 feet from the stream centerline which should remain free from alteration. What stream buffers will be used by the proposed roadway project relative to Edwards Rules guidance?	A specific stream buffer is not proposed. The project schematic shows a bridge crossing Bear Creek. It is planned to cross the water body nearly perpendicular to the flow.
City of Austin	Texas Commission on Environmental Quality 2007 Edwards Rules Optional Enhanced Measures state "Lack of maintenance can be one of the primary causes of BMP failure". Describe the	TxDOT has a well-established maintenance program for permanent water quality controls. The program includes regular inspections that exceed the minimum frequency required.

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	maintenance plans that will be implemented to ensure continued operation of the proposed BMPs as designed to ensure no adverse impacts from long-term operation of the proposed project.	
City of Austin	This statement is not consistent with the research findings of the cited article "Further research into vegetative control measures such as VFS and grassy swales found that VFS can remove up to 99 percent of TSS and up to 97 percent of metals (Barrett, 2004)". The referenced article specifically concluded “The strips were generally less effective at removing dissolved metals and essentially no change in concentration was observed for nitrogen and phosphorus. Concentrations of organic carbon, dissolved solids, and hardness were observed to increase. “Further, the range of TSS removals for VFS reported by Barrett was -450% to 97%, not 99% as reported and with an overall average of only 24%. Please adjust the text to correctly reflect the citation. Please calculate the pollutant loads for the listed constituents predicted to not be removed or predicted to increase based on this report.	The cited study was reviewed and a change was made in the Final EIS text to reflect the finding that the best management practices (BMPs) in the discussion could remove up to 97 percent of Total Suspended Solids (TSS) and 99 percent of lead (as opposed to 99 percent of TSS and 97 percent of lead, as originally stated in the Draft EIS). This change brought the citation into alignment with the findings provided in the study. Since this discussion pertains to maximum capabilities of the BMPs, the discussion was not amended to include ranges or averages. With respect to the effect of various BMPs on highway-associated stormwater constituents, the Final EIS provides published removal efficiencies in Table 3.6-3 and Table 3.6-7; Appendix H provides additional data in Table 5.1-1 and Table A.5-1.
City of Austin	""little adverse impacts would be expected for all but the most sensitive receiving waters". Please evaluate the sensitivity of the receiving waters and the Edwards Aquifer. Onion and Bear creeks by City of Austin monitoring data are of the highest quality in the Austin area, and the Edwards Aquifer has been described by the Texas Groundwater Protection Committee as the most sensitive aquifer to contamination in Texas. As such, they are sensitive water bodies and would be adversely impacted by highway runoff.	The current state and trends of surface water resources are presented in Appendices D and I. This information is based on data collected in the project area and reported by various agencies in the region.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. Eleven water quality ponds/hazardous material traps are proposed for the treatment of stormwater throughout the SH 45SW corridor. These permanent BMPs would be installed as early as practicable during the construction of the proposed project to allow for the detention and treatment of on-site stormwater. Staged construction, limited soil disturbance/preservation of natural vegetation, and soil stabilization BMPs would be in place through construction to decrease erosion and ensure that off-site discharge of sediment is minimized to the greatest extent practicable.	It is unclear what the comment is referring to when it mentions “US Environmental Protection Agency guidance and case law.” The term “greatest extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Text touts the benefits of TSS removal from PFC pavement yet other parts of the DEIS (page 154) indicate that the relatively	Steep cross slopes are in limited areas of the overall project. Permeable Friction Course was not included in total suspended solids calculations where steep cross slopes would occur.

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	steep cross slope of the SH45 pavement will reduce its TSS removal benefits.	
City of Austin	DEIS does not address runoff that will infiltrate soils and recharge the aquifer and potentially enter local caves with karst fauna. Rainfall and runoff are known to infiltrate through soils (Hauwert and Sharp, 2014 and Cowen and Hauwert, 2013).	Discussion of infiltration is included in the Draft EIS.
City of Austin	Again, DEIS does not acknowledge that Flint Ridge Caves runs under part of the highway ROW.	The Flint Ridge Cave footprint is acknowledged in the Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas. The footprint is also depicted on updated figures that are included in the Final EIS (Figure 3.7-7, schematics in Appendix C).
City of Austin	Previous comments address difference in Flint Ridge surface catchment in DEIS versus determined by COA.	Comment noted.
City of Austin	Use of bentonite to reduce infiltration of runoff through soils is creative and indirectly acknowledges that runoff does infiltrate through soils. However, it does not address how the bentonite will stay hydrated to prevent cracking which would allow runoff to pass through the bentonite layer and into the vadoze zone.	The bentonite berm has been removed from the plans. Per RG-348, Page 3-38, Section 3.4.2: "Impermeable liners should be used for water quality basins (retention, extended detention, sand filters, wet ponds and constructed wetlands) located over the recharge zone and in areas with the potential for groundwater contamination. Impermeable liners may be clay, concrete or geomembrane." This would include the use of bentonite. The minimum thickness is 12" of clay. Topsoil and approved vegetation is desirable just so long as large bushes and trees are not allowed due to possibility of roots penetrating through the liner. Cracking or a compromised liner would be the target of a best management practice maintenance plan, so it will be addressed in the Water Pollution Abatement Plan. There are no requirements to keep a clay liner hydrated. If there is a long dry spell and the liner cracks, then it would be repaired and maintained according to the best management practice maintenance plan.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable, as would be the case at Flint Ridge Cave where the state-owned ROW intersects part of the cave's approximately 43.8-acre surface catchment basin.	It is unclear what the comment is referring to when it mentions "US Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	The re-routing of runoff to Flint Ridge Cave appears to consist of a culvert in coordination with the multi-use trail. Can it be relocated further south to allow a bigger area (of non-polluted, natural runoff) to be re-routed to Flint Ridge Cave?	The alignment has been shifted away from the surface expression of Flint Ridge Cave and the surface water capture plan has changed as well such that the current designs do not include many of the previous design elements.

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City of Austin	Figure 3.7-7 shows the surface catchment of Flint Ridge Cave. The area is smaller than that determined by COA and the main difference appears to be in the east side of the basin not impacted by the highway. The boundary on the west and north sides appear to be generally similar.	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed.
City of Austin	The DEIS should also examine restoring surface runoff to other karst features impacted by SH45.	The preservation of recharge water quality and quantity were important design considerations at each of the sensitive karst features identified.
City of Austin	Use of BMPs would reduce the impact of some constituents, potentially including TSS, but not all constituents including nutrients and dissolved contaminants thus resulting in adverse water quality impacts from the proposed project.	Batch detention water quality ponds act like wet ponds and have better nutrient removal than a sand filter (Middleton and Barrett, 2008, Landphair et al., 2000)
City of Austin	The DEIS reports no observation of oak wilt in the proposed ROW, but there is at least one very large oak wilt center between proposed SH45SW and the Shady Hollow neighborhood.	See the Biological Evaluation for discussion of oak wilt in the project vicinity. TxDOT follows Forest Service practices when clearing areas of oak wilt. Oak wilt training will be incorporated into Environmental Compliance Management Plan.
City of Austin	Table 3.8-2 states that the Barton Springs and Austin blind salamander have no potential to occur within the study area. Eurycea spp have been found in nearby springs and caves, and though it's still being debated as to what species they are (E sosorum, E nana, or a new species).	Potential impacts to Barton Springs and Austin blind salamanders are discussed further in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas and in the report titled: Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.

Organization	Verbatim Comment	Response
City of Austin	Data from ongoing biologic surveys of caves on the ROW is not included in this document and therefore the impact of SH45 construction and operation on cave biota cannot be determined. If included at a later date, the document needs to address how that data will be reviewed by interested parties.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
City of Austin	The description of the karst zones on p. 227 and in figure 3.8-3 shows the remapping of Veni's 1992 karst zone 2 as zone 3 for containing listed invertebrate karst species. However, it does not add that Veni (2007) stated " While Zone 2 in the South Travis County and Northern Hays County Karst Fauna regions have now been downgraded to Zone 3, non-listed rare species have been found in the South Travis Karst Fauna Region, and a high potential for rare species exists in the Northern Hays County Karst Fauna Region. Nineteen caves with rare species occur in the Rare Karst Species Zone 1 area in the South Travis County Karst Faunal Region. The study area is also mapped as Karst Zones 1 & 2 on the BCCP detailed maps and will require mitigation if the project utilizes the Balcones Canyonlands Conservation Plan permit to address potential impacts to threatened and endangered species.	Comment noted. Information regarding the project's potential impacts to karst invertebrates is included in Appendix M: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
City of Austin	There is a record of Texella reyesi for Barker Ranch Cave that is thought to be an error in identification, but has not yet been resolved.	Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas addresses the record of Texella reyesi as an errant determination of the specimen. As discussed in the Biological Evaluation, the standing expert on the species, Darrell Ubick of the California Academy of Sciences, has studied specimens from Barker Ranch Cave No. 1 and concluded that these specimens likely belong to Texella mulaiki. Based on this result it was concluded that the listed species, T. reyesi, does not occur in the project area.

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City of Austin	The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.	It is inappropriate to discuss the amount of potential Golden-cheeked Warbler habitat from the Texas A&M University habitat map without examining the demographic model. Texas A&M University estimated the amount of mixed woodland patches using remotely-sensed imagery and Geographic Information Systems layers. This map – it is not a model – is independent of any warbler surveys used to obtain the occupancy and abundance estimates. This map delineates all potential mixed woodland that could serve as warbler habitat during the breeding season. The original objectives of the Texas A&M University occupancy and abundance models were to estimate breeding population size of male warblers across the species' breeding range using a predictive model that incorporated range-wide predictor variables. Texas A&M University provided city of Austin with patch-specific abundance estimates for properties within the Balcones Canyonlands Preserve with several caveats about the proper use of these estimates. Texas A&M University explained that the predicted density estimates are based on a regression model that was developed at a much larger scale than the Balcones Canyonlands Preserve. As such, predictions from the model at a local scale will result in some bias in point estimates, causing estimates from other methods to be either higher or lower. See the Final Draft: State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report for further discussion of the Golden-cheeked Warbler and its habitat in the vicinity of the project.
City of Austin	Table 3.8-3 For Species of Greatest Conservation Need (SGCN) Stygobromus russelli is confirmed for Flintridge cave (quite abundant in the stream passage and pools). Cave Myotis bat (Myotis velifer) is also confirmed for Flintridge cave as well as several other caves within the study area, however, in recent years the numbers of bats have been in a severe decline.	Comment noted. Based on the design, there will be no net loss of recharge to Flint Ridge Cave.
City of Austin	The section on the BCP should discuss the 62 caves and the protection that is required by the BCCP permit for them. It also mistakenly states that Travis County, COA, and LCRA are the entities responsible for this regional habitat conservation plan. Travis County and the City of Austin hold the permit and there are multiple partners such as LCRA who manage mitigation lands within the Balcones Canyonlands Preserve.	Changes made.
City of Austin	Figure 3.8-4is not current and needs to be updated due to acquisitions of Hudson, Searcy, Spillar golf, and the Ruby Ranch conservation easement. That coverage is available upon request from COA either the Environmental Resources Management Division of Watershed Protection Department or the Wildlands Conservation Division of the Austin Water Utility.	Figure 3.8-4 has been updated in the Final EIS.

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City of Austin	This statement "Soil studies (Wilding, 1993, 1997) have shown that the Flint Ridge Cave surface drainage basin is relatively impermeable and potential pollutants would be unlikely to impact Barton Springs via surface infiltration…" is not supported by the citations and is invalid. Wilding 1997 is a general review of Brackett soils and is not a site specific evaluation of Flint Ridge Cave or its surface drainage area. Soils around Flint Ridge Cave have been documented to be permeable, and upland recharge through soil infiltration has been documented (see Hauwert and Sharp 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration in Journal of Water Resource and Protection) and Cowen and Hauwert, 2013.	The Environmental Impact Statement has been updated to refer to site specific soil studies such as TxDOT, 2005 and other technical reports (Sections 3.3.1 and 3.8.1).
City of Austin	There are numerous inaccuracies in the information presented on Flint Ridge Cave: surface drainage presented is smaller than determined by COA, the COA 2012 references is a short summary of activity and did not "delineate" the subsurface basin for Flint Ridge Cave but simply stated it was greater than 100 acres, the DEIS errors in the observations made during a runoff event at the cave in which the runoff from undeveloped ground was so clear that it states "Note how rocks and vegetation are clearly visible below the surface of the runoff."	There is an update to the Flint Ridge Cave watershed (from the Draft EIS version) which was delineated using numerous versions of LIDAR and aerial topographic survey. To remove the subjective nature, the actual watershed boundary was delineated using CADD/Civil Engineering software with "Upstream Trace" tools that automatically identify the high ridges or watershed boundary (as shown in the LIDAR and aerial) around Flint Ridge Cave. The Project Team believes that the City of Austin version of the Flint Ridge Cave watershed does not take into consideration a clearly defined natural swale that conveys a great deal of area away from the Cave's entrance. The latest Flint Ridge Cave drainage area is 55.5 acres and it is the project team's stance that this version does not contain errors based on numerous versions of LIDAR survey that all agree with the same result. Figure 3.7-7 shows Flint Ridge Cave's surface drainage basin and proposed best management practices.
City of Austin	For a more thorough discussion of soil characteristics, the DEIS should also reference other reports such as Cowen and Hauwert (2013) that indicate the soil is more permeable than reported by Wilding.	Comment noted.
City of Austin	Soil studies by Wilding (1993, 1997) conflict with Hauwert's recharge data in the Flint Ridge Cave basin that demonstrates the majority of water in the basin recharge diffusely, not just through the discrete cave opening.	Comment noted. Additional information pertaining to recharge potential associated with various pathways is presented in the Final EIS.
City of Austin	The Flint Ridge Cave subsurface contributing basin is reported as over 100 acres in area, but this area has not been mitigated or addressed elsewhere in the DEIS, only the surface drainage basin. If the work by Wilding (1993, 1997) is being used to reject impacts here, this would be in conflict with other science prepared by Hauwert regarding recharge in this area.	The sub-surface nature of Flint Ridge Cave has been identified (Veni, Dec 1999) and was used to establish its protective buffer. A 105 meter radius around Flint Ridge Cave has been provided for cave cricket foraging.
City of Austin	This determination is supported by a study conducted by Paquin and Hardin that suggests that C. cueva, C. bandida, and C. reyesi may all be variants of a single species (Paquin and Hardin, 2005). The study was conducted by Paquin and Hedin, not Hardin.	Hardin was revised to Hedin.

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City of Austin	The federal permit for the BCCP requires that the surface and subsurface drainage basins for caves used as mitigation are protected. It also requires the preservation of the ecological integrity of the cave. The subsurface drainage basin of Flint Ridge cave is not yet known. Also, the U.S. Fish and Wildlife Service developed karst preserve design criteria in 2012 which should be reviewed and referenced. USFWS 2012. Karst Preserve Design Recommendations. Austin Ecological Services Field Office, Austin, TX. They require protection of the cave cricket foraging area.	Protective Buffers have been established for each sensitive karst feature and are shown in details that will be included in subsequent reports. The surface drainage area for each sensitive karst feature is maintained so ecological integrity will not be impacted. The sub-surface nature of Flint Ridge Cave has been identified (Veni, Dec 1999) and was used to establish its protective buffer. A 105 meter radius around Flint Ridge Cave has been provided for cave cricket foraging.
City of Austin	This section indicates that the surface drainage basin for Flint Ridge Cave has been delineated by topographic survey and covers approximately 43.7 acres. This is not correct, the actual acreage is 57.8 acres.	There is an update to the Flint Ridge Cave watershed (from the Draft EIS version) which was delineated using numerous versions of LIDAR and aerial topographic survey. To remove the subjective nature, the actual watershed boundary was delineated using Computer-aided Design/Civil Engineering software with "Upstream Trace" tools that automatically identify the high ridges or watershed boundary (as shown in the LIDAR and aerial) around Flint Ridge Cave. The Project Team believes that the city of Austin version of the Flint Ridge Cave watershed does not take into consideration a clearly defined natural swale that conveys a great deal of area away from the cave's entrance. The latest Flint Ridge Cave drainage area is 55.5 acres and it is the project team's stance that this version does not contain errors based on numerous versions of LIDAR survey that all agree with the same result.
City of Austin	The DEIS briefly mentions the fact that Flintridge cave has species of concern (species that the permit attempts to adequately protect in an effort to preempt the need for future listing.) The DEIS does not mention the fact that Flintridge cave is one of 62 karst features that the BCCP permit is tasked with protecting. According to the latest FWS Karst preserve Design Recommendations (U.S. Fish and Wildlife Service. 2012. Karst Preserve Design Recommendations. Austin Ecological Services Field Office, Austin, TX.), the surface, subsurface, cave footprint and cave cricket foraging area should be protected. If SH 45 SW is built and the cave environmental integrity is not protected, this may prompt the listing of the species of concern.	Balcones Canyonlands Preserve section has been updated in Final EIS to explain that Flint Ridge Cave is one of 62 protected karst features under the Balcones Canyonlands Conservation Plan. Environmental integrity of Flint Ridge Cave would be protected as discussed in the Biological Evaluation. The sub-surface nature of Flint Ridge Cave has been identified (Veni, Dec 1999) and was used to establish its protective buffer. A 105 meter radius around Flint Ridge Cave has been provided for cave cricket foraging.
City of Austin	No analysis of the impacts as a result of highway lighting at night are included in this section. Impacts to existing unlit conditions as a result of the proposed project should be included in the assessment of wildlife impacts.	Safety lighting would be utilized for the proposed project. Only the intersections would be lit; the rest of the roadway would remain dark. Lights may be installed along the shared use path in certain locations. This information has been added to the Visual and Aesthetic Resources section in the Final EIS.
City of Austin	Cannot locate the Wilding 2007 reference. The Wilding 1997 reference does not support statement in DEIS. Source of the sediment contribution mass cannot be verified.	Discussion of Wilding 2007 has been removed.

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City of Austin	No discussion of impacts to deer population as a result of vehicle collisions is presented in this section.	No special accommodations would be made for wildlife under the proposed project. Wildlife could cross the roadway at the Bear Creek bridge. Collision mortality of wildlife as a result of the operation of SH 45SW is discussed further in the Biological Evaluation. TxDOT and Central Texas Regional Mobility Authority are considering fencing, provided adjacent landowners agree and that it is compatible with adjacent land use.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Fish species would not be significantly impacted by the proposed project. Bear Creek, the only water body indicated on published maps as being perennial in the proposed project area (though it has been observed to be intermittent with perennial pools), would be bridged to avoid or minimize impacts to the creek and wildlife species in the creek.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	Table 3.8-5 states that there is no take for the Barton Springs Salamander Eurycea spp have been found in nearby springs and caves, and though it's still being debated as to what species they are (E sosorum, Enana, or a new species.)	Potential impacts to Barton Springs and Austin blind salamanders are discussed further in the Biological Evaluation.
City of Austin	Table 3.8-5 states that there will be no take of Austin Blind Salamander, however karst and groundwater studies that would be necessary to support this statement are not yet completed.	Updated information regarding potential impacts to Austin blind salamander provided in Biological Evaluation.
City of Austin	Table 3.8-5 states that there will be no take of Barton Springs Salamander, however karst and groundwater studies that would be necessary to verify this are not yet completed.	Updated information regarding potential impacts to Barton Springs salamander provided in Biological Evaluation.

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City of Austin	Table 3.8-5 - The table states that no take of GCWAs will occur from the proposed SH45. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas. Also, indirect effects could occur to GCWAs adjacent to the ROW.	It is inappropriate to discuss the amount of potential Golden-cheeked Warbler habitat from the Texas A&M University habitat map without examining the demographic model. Texas A&M University estimated the amount of mixed woodland patches using remotely-sensed imagery and Geographic Information Systems layers. This map – it is not a model – is independent of any warbler surveys used to obtain the occupancy and abundance estimates. This map delineates all potential mixed woodland that could serve as warbler habitat during the breeding season. The original objectives of the Texas A&M University occupancy and abundance models were to estimate breeding population size of male warblers across the species' breeding range using a predictive model that incorporated range-wide predictor variables. Texas A&M University provided city of Austin with patch-specific abundance estimates for properties within the Balcones Canyonlands Preserve with several caveats about the proper use of these estimates. Texas A&M University explained that the predicted density estimates are based on a regression model that was developed at a much larger scale than the Balcones Canyonlands Preserve. As such, predictions from the model at a local scale will result in some bias in point estimates, causing estimates from other methods to be either higher or lower. Furthermore, Texas A&M University made no assertions that the predictor variables used at the range-wide scale are the best models to describe the species-habitat relationship at this local scale. See the Final Draft: State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report for further discussion of the Golden-cheeked Warbler and its habitat in the vicinity of the project.
City of Austin	Table 3.8-5 states that there will be no take of listed endangered karst invertebrates however karst investigations are still underway.	The technical report, Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas, is complete and was provided to the Technical Work Group. Karst invertebrate surveys have been completed and results are provided in the Biological Evaluation and Final EIS. No listed karst invertebrates were observed in karst features in the state-owned right-of-way and no impact to these species is anticipated.
City of Austin	Table 3.8-5 states that there is no suitable habitat within the ROW and no take of the Golden-cheeked Warbler based on SWCA 2014. However previous studies by SWCA and others have documented suitable habitat and Golden-cheeked Warblers within 300 feet of the ROW and this information was provided to TxDOT. The ROW and portions of the study area are also mapped as Zones 1 and 2 on the BCCP Golden-cheeked Warbler habitat maps. These areas require mitigation for take of habitat even if Golden-cheeked Warblers have not been documented.	The State Highway 45SW: Golden-cheeked Warbler Technical Report summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. According to the Balcones Canyonlands Conservation Plan Fee Zone Map, the project lies within "Unconfirmed Golden-cheeked Warbler Habitat (Zone 2)" and "Not known to be

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		Golden-cheeked Warbler Habitat (Zone 3)". TxDOT is looking into the possibility of participating in the Balcones Canyonlands Conservation Plan.
City of Austin	Impacts to the quantity of water recharging the Edwards Aquifer would constitute take of endangered salamanders. The proposed project will reduce diffuse recharge as a result of increased impervious cover, reduce diffuse recharge thru subsurface connections to known karst features, and will directly impact the surface catchment areas of known karst features. Comparison of the total impervious cover of the proposed project to the impervious cover for the entirety of the recharge zone is not a valid method to conclude no take of the effected species unless documentation of previous similar actions by the US Fish and Wildlife Service can be referenced. As defined by the endangered species act, an action that directly or indirectly impacts endangered species or their habitat constitutes take and requires consultation and approval from the US Fish and Wildlife Service.	A technical report "Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas" and the "SH 45SW: Biological Evaluation" address the water quality and quantity effects of the roadway, all design and best management practices employed to protect the water as well as any impacts the roadway may have on the salamanders. These two reports are appended to the Final EIS. TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules regarding water quality. As designed, the proposed best management practices would exceed treatment requirements. In addition, the retention of stormwater runoff and gradual release from water quality ponds would maintain the quantity of water recharging to the aquifer. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation, which is included as an attachment to the Final EIS.
City of Austin	Observations of Texella reyesi has not been dismissed, the work looking into this question is ongoing	The standing expert on the species, Darrell Ubick of the California Academy of Sciences, has studied specimens from Barker Ranch Cave No. 1 and concluded that these specimens likely belong to Texella mulaiki. Based on this result it was concluded that the listed species, T. reyesi, does not occur in the project area. This is discussed further in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.

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City of Austin	The draft EIS states that SWCA observed GCWA habitat within the ROW and GCWAs adjacent to the ROW in 2013. Acreage estimates and number of GCWAs observed prior to 2014 should be presented, along with a map of the locations. The draft then states that the same consulting firm did not observe habitat or GCWAs in 2014. The change in habitat conditions from 2013 to 2014 should be explained. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.	It is inappropriate to discuss the amount of potential Golden-cheeked Warbler habitat from the Texas A&M University habitat map without examining the demographic model. There is obvious confusion in this statement by city of Austin about the origin of the potential habitat map and the demographic model. Texas A&M University estimated the amount of mixed woodland patches using remotely-sensed imagery and Geographic Information Systems layers. This map – it is not a model – is independent of any warbler surveys used to obtain the occupancy and abundance estimates. This map delineates all potential mixed woodland that could serve as warbler habitat during the breeding season. The original objectives of the Texas A&M University occupancy and abundance models were to estimate breeding population size of male warblers across the species' breeding range using a predictive model that incorporated range-wide predictor variables. Texas A&M University provided City of Austin with patch-specific abundance estimates for properties within the Balcones Canyonlands Preserve with several caveats about the proper use of these estimates. Texas A&M University explained that the predicted density estimates are based on a regression model that was developed at a much larger scale than the Balcones Canyonlands Preserve. As such, predictions from the model at a local scale will result in some bias in point estimates, causing estimates from other methods to be either higher or lower. Furthermore, Texas A&M University made no assertions that the predictor variables used at the range wide scale are the best models to describe the species-habitat relationship at this local scale. See the Final Draft: State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report for further discussion of the Golden-cheeked Warbler and its habitat in the vicinity of the project.
City of Austin	It is stated here that SWCA documented habitat sharing the basic characteristics of Golden-cheeked Warbler habitat in 2013 and that GCWA's have been observed immediately adjacent to the ROW, but goes on to state that there is no take. This is inaccurate.	TxDOT took into consideration all Golden-cheeked Warbler surveys and habitat assessments in the vicinity of the state-owned right-of-way since 2000 along with the best available scientific and commercial data and concluded that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. In addition, habitat sharing some of the basic characteristics of Golden-cheeked Warbler habitat was observed within the state-owned right-of-way during field surveys conducted in 2013. For the sake of thoroughness, SWCA Environmental Consultants surveyed all the wooded portions of the state-owned right-of-way for Golden-cheeked Warblers in 2014. The 2014 survey indicates that Golden-cheeked Warblers do not occur in the state-owned right-of-way and that the species occurs intermittently at best in general proximity to the right-of-way on lands owned by the City of Austin. Therefore, TxDOT has concluded that no direct or indirect impacts to the Golden-cheeked Warbler are anticipated and there is expected to be no take of this

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		species from the proposed project. Additional information is provided in the following technical reports: State Highway 45SW: Golden-cheeked Warbler Technical Report and Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	The COA 2011 reference does not appear to address the statement in the DEIS. The statement in the DEIS appears to be another misstatement from the COA 2012 summary report that actually states that the runoff into the cave was clear enough to see rocks and other debris on the ground through the runoff.	Revised this paragraph to provide info from the Balcones Canyonlands Conservation Plan Status of Flint Ridge Cave (City of Austin, 2012). Paragraph now reads: Runoff into Flint Ridge Cave even after intense storm events has been shown to be clear and of good quality (City of Austin, 2012). The analyses of potential impacts to groundwater recharge as a result of the proposed project show that the water quality of runoff entering Flint Ridge Cave would be maintained (Section 3.6)
City of Austin	How will the maintenance of the 2900 ft. berm and bentonite liner routing roadway runoff away from Flint Ridge Cave be managed over the lifetime of the project?	The berm and bentonite liner have been removed from the project design.
City of Austin	Regarding impacts to the hydrology of Flint Ridge Cave, this only addresses the surface drainage issues, does not touch impacts to the subsurface drainage basin	Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices. TxDOT has evaluated the potential impacts of the proposed project on Flint Ridge Cave and determined that the project would not impact the ecological integrity of the cave. More information is available in Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas.
City of Austin	States that rare karst invertebrates are not expected to occur within the state-owned ROW. This is inaccurate.	Changes have been made in the Final Environmental Impact Statement to correct that statement.
City of Austin	This section briefly discusses potential impacts on Flint Ridge Cave related to water quantity and quality, but does not address impacts related to the cave cricket foraging area, vegetation and nutrient impacts, introduction of invasive species and changes in the cave microclimate.	TxDOT has evaluated the potential impacts of the proposed project on Flint Ridge Cave, including issues such as cave cricket foraging area, vegetation and nutrient impacts, introduction of invasive species, and changes in the cave microclimate, and determined that the project would not impact the ecological integrity of the cave. More information is available in Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas.

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City of Austin	Several recent peer-reviewed studies with large sample sizes of color-banded GCWAs and GCWA nest monitoring clearly show negative effects of edge on GCWA density and reproductive success, including Peak and Thompson 2013 (not included in the citations), Peak 2007, and Reidy et al. 2009. The draft EIS cites other studies "reportedly showing no significant effects from edge habitat." Coldren 1998 is one of the studies cited; however, Coldren's dissertation found "positive relationships of patch size with pairing success and reproductive success.... Reproductive success was greatest in territories farther than 100 m from edge....Territorial placement within a patch appeared to be influenced by adjacent land uses, with warblers selecting agriculture and grasslands as the nearest land use, and selecting against commercial development, entertainment, forested non-warbler habitat, and high-density transportation...Distance to the edge and territory size were greatest for territories closest to land uses with the highest levels of human disturbance." The draft EIS also cites Kroll 1980 as finding no significant effects from edge. According to the 1992 GCWA recovery plan (not included in the citations), the number of GCWAs on Kroll's study site were reduced from 24-28 territories to 5 territories in 1991 following extensive cutting of the oak-juniper woodlands into narrow strips. This information suggests Kroll's study site did experience negative effects from edge and is consistent with the findings of Peak 2007, Reidy et al. 2009, and Peak and Thompson 2013. Citations: U.S. Fish and Wildlife Service. 1992. Golden- cheeked Warbler Recovery Plan. Albuquerque, New Mexico. 88 pp.; Peak, R. and F.R. Thompson. 2013. Amount and type of forest cover and edge are important predictors of Golden-cheeked Warbler density. The Condor 115(3):659-668.	Comment noted. TxDOT has evaluated the possible effect of edge to the Golden-cheeked Warbler and description of the existing conditions at the SH 45SW right of way include edges of the woodland habitat created by others as existing for several years. No changes to the effects of edge upon the Golden-cheeked Warbler are expected based on the existing conditions with edge at the right of way line and recent studies showing that roadways and construction activity do not affect the Golden-cheeked Warbler. See the State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report for additional information.
City of Austin	We were unable to find a copy of the Horne and Anders 2001 annual report for Fort Hood. The draft EIS should rely on peer-reviewed scientific literature; if grey literature is cited, it should be readily available to the public. We do have a copy of an annual report by Horne in 2000, which found that "openings as narrow as 10-20 m may result in loss of breeding habitat for Golden-cheeked Warblers." This would appear to contradict the findings of no significant effects of edge as reported in the draft EIS. Further, the peer-reviewed findings of Peak 2007 and Peak and Thompson 2013 should supersede the earlier findings presented in annual reports for Fort Hood.	Horne and Anders 2001 is available from the Natural Resources Management Branch, Building 1939, Directorate of Public Works, Fort Hood Garrison, Department of the Army, Fort Hood, Texas 76544. The best available scientific and commercial data is being used in the Environmental Impact Statement.

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City of Austin	The draft EIS seems to suggest that the LCRA utility easement provides a sufficient buffer against indirect effects of the proposed SH45. This appears to assume that all edges have the same effects. However, Coldren 1998 found that GCWAs select agriculture and grassland edges and against high-density transportation and other edges with high levels of human disturbance. Sperry 2007 also found that GCWAs were detected with greatest frequency along a utility easement compared with a housing development and woodland meadows. Based on the best available information, the proposed SH45 can be expected to have greater impacts on the GCWA and its habitat than the existing LCRA utility easement.	TxDOT has evaluated the potential for SH 45SW to have an impact upon the Golden-cheeked Warbler through the analysis of all the best available scientific and commercial data, including all surveys in the area since 2000, and concluded that SH 45SW would not alter the manner in which the Golden-cheeked Warbler would use the surrounding woodland from the manner in which the Golden-cheeked Warbler has been using the habitat since 2000. The technical report, State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report, provides additional information.
City of Austin	The draft EIS states that "predation does not appear to be a major process affecting the presence of warblers or the relationship between nearby land uses and patch size" based on a report by Arnold et al. 1996. This study used artificial nests, which are not necessarily representative of actual nest predation. In contrast, Peak 2007 and Reidy et al. 2009 are peer-reviewed publications based on relatively large sample sizes of GCWA nests and color-banded individuals, so are more appropriate to cite in the draft EIS.	The State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report updates the information used to make the determination of the potential for SH 45SW to affect the Golden-cheeked Warbler. This information is incorporated in the Final EIS.
City of Austin	The draft EIS cites studies that appear to show little to no effect of road construction and road noise on GCWA densities or reproductive success. However, Benson 1995 and Lackey et al. 2011 were not based on monitoring of color-banded individuals or GCWA nests, which would provide more compelling conclusions. Further, the Vickery method used to determine reproductive success in Lackey et al. 2011 is a reproductive index based on behavioral observations rather than nest fate and was developed for grassland birds. Morgan et al. 2012 found that although the Vickery method "may function as a coarse indicator of habitat suitability (e.g., documenting production in potential ecological traps), in our study the index exhibited neither internal consistency nor the ability to predict nest fate at the plot or territory level and functioned poorly as a substitute for nest searching and monitoring." The reliability of the Vickery method also needs to be field tested on woodland birds such as the GCWA. Based on preliminary data from the Balcones Canyonlands Preserve, we have found that the Vickery method does not provide reliable productivity data compared with color-banding and nest monitoring. Color-banded individuals would also provide more accurate data on territory size and placement, as well as age	All of these statements are based on two incorrect assumptions – 1) that one cannot infer territory density or reproductive success using unbanded birds, and 2) that the Vickery Index is an unreliable method for assigning territory-scale productivity. Color-banding is a useful technique when there is a high degree of overlap among territories or if the research question of interest requires specific demographic information about individual birds. However, researchers have used spot-mapping techniques to examine the spatial distribution and reproductive status of unbanded, territorial birds for decades and research conducted on unbanded birds is frequently published in peer-reviewed journals. Given the Environmental Impact Statement reviewer's insistence that banded birds are a necessary component of Golden-cheeked Warbler research, it is important to note that studies with banded birds are not without their own set of limitations. Bands can be misidentified, the process is time consuming, and because of the number of banded birds necessary to conduct a thorough study, banding generally restricts the study and inferences to a small geographic area with very specific ecological conditions. As indicated by the response to the Environmental Impact Statement draft, Golden-cheeked Warblers exhibit high site fidelity and males can be repeatedly relocated in the same areas using auditory and visual cues throughout the course of the breeding season. While it is true that more information on the age structure or population turnover along roadway corridors

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	structure and population turnover. GCWAs tend to exhibit high site fidelity, so it would be helpful to know whether this holds true for areas along the roadway corridors as well. Citation: Morgan, M. R., C. Norment, and M. C. Runge. 2012. Evaluation of a reproductive index for estimating productivity of grassland breeding birds. Auk 127:86–93.	could be obtained if Golden-cheeked Warblers were banded on the site, those were not objectives of the highway studies and the argument that the research is inaccurate or unreliable simply because data were collected on unbanded individuals is without merit, especially since estimates of territory density and territory size in this study are similar to values reported by other research groups in Austin and at Fort Hood (Groce et al. 2010). With regards to Golden-cheeked Warbler productivity, the Vickery Index (Vickery et al. 1992) represents the reproductive success of a territory, specifically the males' pairing and fledging success. It is a method used to avoid potential biases associated with non-randomly collected nest data (Martin and Geupel 1993), to collect data when females or nests are difficult to locate and monitor (Craft 1998), to sample a large geographic area (Villard and Part 2004, Althoff et al. 2009), and to limit disruption of nesting pairs (Gotmark 1992, Mass 1998), which is critical for studies that involve rare or endangered species. Effectiveness of the Vickery method has been tested on a wide-range of species, including small songbirds that inhabit woodland vegetation. Christoferson and Morrison (2001) conducted research in a forest system and correctly predicted the breeding outcome of a pair 80-92 percent of the time for the avian species included in their study. Other studies have found that nest searching or territory-scale indices are both appropriate for determining reproductive success (Bonifait et al. 2006, Marzluff et al. 2007) Studies on grassland birds have found that the reproductive index might not be effective for such species, attributing much of the reasoning to species-specific or individual behaviors that reduce observer detection of nesting activity. One study on grassland birds suggested a failure of the index because the focal species had uniparental nest care and the species is wary of observers, which reduced the ability of the observers to detect females performing nesting activities (Rivers et al. 2003). Morgan et al. (2010) noted that their focal species displayed defensive behaviors when observers were present, which reduces the observer's ability to detect nesting behavior. GCWA have biparental care of the nest, increasing the likelihood of detecting nesting activity, and rarely do they exhibit alterations in behavior using protocols that reduce such disturbances. Texas A&M University observers adhere to a strict protocol to reduce behavioral changes in the warbler under observation. Rivers et al. (2003) noted that reproductive indices might also not accurately estimate productivity in systems with high Brown-Headed Cowbird parasitism; however, Brown-Headed Cowbird parasitism is low for GCWA across multiple study areas (see Groce et al. 2010). GCWA nests are cryptic and time-consuming to search for and monitor. When nests are difficult to locate, observers are more likely to miss nesting attempts resulting in a biased sample of nests (Villard and Part 2004, Nocera et al. 2007). When a study spans multiple years or study areas, nest crypticity can introduce considerable bias among years and study sites; whereas a reproductive index can eliminate this source of variation (Bolger et al. 2005). As mentioned above, Golden-cheeked Warblers exhibit high site fidelity and maintain

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		territorial boundaries during the breeding season. There can be overlap around the edges of territories. However, an incursion of neighboring birds into adjacent territories does not negatively affect our ability to assign a productivity outcome to a territory. Extreme care is taken when assigning reproductive outcome by making repeated visits to the territory and restricting assigning reproductive success to territories that have only recently fledged young. Additionally, productivity is compared across locations (i.e., control and treatment plots) and not individual territories, so we are confident in assuming that any error in assigning reproductive outcome to a territory is similar across sites. Studies comparing across land management treatments concur that a reproductive index is appropriate (Nocera et al. 2007, Althoff et al. 2009). There are several other methods used to assess the reproductive activity of birds, including the nest searching and monitoring methods described in the Environmental Impact Statement reviewer's comments. However, as with banding, no methods are without limitations (e.g., repeated visits to nests can increase nest mortality, nest searching and monitoring can influence bird behavior, nest searching and monitoring can limit the amount of time available to collect data for other important questions, even when a high percentage of birds are banded researchers must sometimes infer reproductive success from behavioral observations).While nest searching and monitoring would provide specific information about individual nesting attempts, we chose to address a completely different variable, territory-scale productivity over the course of the breeding season. Detailed estimates of fecundity are not needed to meet our project goals, thus we chose methods that would enable us to include more territories and larger study areas without depending upon locating cryptic nests (Althoff et al. 2009). Because warbler's can renest several times over the course of the breeding season (Groce et al. 2010), our chosen response variable represents a minimum indicator of reproductive success. Again, our estimates for Golden-cheeked Warbler pairing and fledging success using the Vickery method are similar to values reported by other research groups in Austin and at Fort Hood and have been accepted for publication in the peer-reviewed literature.
City of Austin	No suitable habitat for GCWA is reported to be within 300ft of the proposed project, but this is in conflict with the SWCA (2013) report on GCWA habitat on the WQPL which shows habitat for this species within 300 ft. This document was provided to TxDOT and is in the references section (Section 8) on page 343 of the DEIS.	Surveys conducted in 2014 indicated that Golden-cheeked Warblers do not occupy any areas within 300 feet of the SH 45SW right-of-way. TxDOT has evaluated the potential for SH 45SW to have any impact upon the Golden-cheeked Warbler through the analysis of all the best available scientific and commercial data, including all surveys in the area since 2000, and concluded that SH 45SW will not alter the manner in which the Golden-cheeked Warbler would use the surrounding woodland from the manner in which the species has been using the habitat since 2000. The State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report and the Biological Evaluation of State Highway 45 Southwest by TxDOT et al, 2014, provide additional information.

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City of Austin	We were unable to find a copy of the Pruett et al. 2014 annual report for Texas A&M. The draft EIS should rely on peer-reviewed scientific literature; if grey literature is cited, it should be readily available to the public. We were able to find a 2013 report by Pruett et al., which appears to have a similar study design as Lackey et al. 2011, but includes a small number of color-banded individuals and GCWA nests. Preliminary findings suggest higher density in the control site, and the map of GCWA territories and nests suggest avoidance of the roadways.	The reference in question is Pruett et. al. 2014. Study of the Potential Impacts of Highway Construction on Selected Birds with Emphasis on the Golden-cheeked Warbler: Annual Report 2013. This annual report shows the placement of nests and territories at the Highway 71 study site in 2013 (see aerial photo in Appendix 3 of Pruett et. al. 2014). The authors located nests opportunistically and, thus, the distribution of nests does not reflect all the nests across the area. Given this, no inferences can be made as to whether the nest site locations are avoiding the roadways or construction. In Pruett et al. 2014, the authors clearly state in the results section that there was no significant difference in nest success among the sites and years. In addition, one cannot infer avoidance of an area by examining density between the control and the treatment site in a single year. In Pruett et al. 2014, the authors used a before-after-control-impact design for impact assessment studies (pages 11–14 in Pruett et al. 2014). This study design relies on comparisons among sites and study years. It is inappropriate to conclude an impact from a single year of data because it does not take in to account the underlying topography, habitat, or other variables that might drive territory placement. The only way to conclude that differences in density are a result of an impact (construction) is to compare across years with and without the impact. It is clearly stated in the results section of the report that there was no statistically significant effect of distance from right-of-way on territory placement (page 31). The authors also state that for all years of the study, density of territories was consistently higher in the control study site but that there was no effect of year (page 32).
City of Austin	The draft EIS states that there is no suitable GCWA habitat within 300 feet of the ROW. Also, the majority of the proposed SH45 ROW is within Travis County, and over half of the ROW falls within the Balcones Canyonlands Conservation Plan's Zone 2 GCWA habitat. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is	Surveys conducted in 2014 indicated that Golden-cheeked Warblers do not occupy any areas within 300 feet of the SH 45SW right-of-way. It is inappropriate to discuss the amount of potential Golden-cheeked Warbler habitat from the Texas A&M University habitat map without examining the demographic model. Texas A&M University estimated the amount of mixed woodland patches using remotely-sensed imagery and Geographic Information Systems layers. This map – it is not a model – is independent of any warbler surveys used to obtain the occupancy and abundance estimates. This map delineates all potential mixed woodland that could serve as warbler habitat during the breeding season. The original objectives of the Texas A&M University occupancy and abundance models were to estimate breeding population size of male warblers across the species' breeding range using a predictive model that incorporated range-wide predictor variables. Texas A&M University provided City of Austin with patch-specific abundance estimates for properties within the Balcones Canyonlands Plan with several caveats about the proper use of these estimates. Texas A&M University explained that the predicted density estimates are based on a regression model that was developed at a much larger scale than the Balcones Canyonlands Preserve. As such, predictions from the model at a local scale will result in some bias in point estimates, causing estimates from other methods to be either higher or lower. Furthermore, Texas A&M University made no assertions that the predictor variables used at the rangewide scale are the best models to describe the species-habitat relationship

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	to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.	at this local scale. See the Final Draft: State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report and the Biological Evaluation of State Highway 45 Southwest by TxDOT et al, 2014 for further discussion of the Golden-cheeked Warbler and its habitat in the vicinity of the project.
City of Austin	States that encroachment-alteration effects on karst species will be determined based on results of the ongoing karst surveys. The impacts cannot be assessed if the surveys are not yet complete.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations.
City of Austin	One site that was worthy of SAL designation was exhausted of research potential, but was the site also salvaged?	One of the historic components of the site 41TV1051 was determined eligible for inclusion in the National Register of Historic Places and State Archeological Landmark designation. Test excavations, extensive archival research, and data recovery excavations (i.e., mitigation) occurred on the parts of the site within the state-owned SH 45SW right-of-way at different times from 2007 to 2009. Based on these data, the significant parts of 41TV1051 within the SH 45SW right-of-way have been mitigated and no additional investigations at the site within the existing SH 45SW right-of-way are warranted, as per a TxDOT and Texas Historical Commission coordination letter dated Aug. 31, 2009.
City of Austin	A windmill or well associated with historic sites 41TV1049 or 41TV1051 may be present. No wells were shown on the well map (Figure 3.11-3) in the vicinity of these sites.	Figure 3.11-3 in the Final Environmental Impact Statement has been updated to include well information from the Barton Springs/Edwards Aquifer Conservation District.
City of Austin	No analysis of the aesthetics impacts as a result of highway lighting at night are included in this section. Impacts to existing unlit conditions as a result of the proposed project should be included in the assessment of visual and aesthetic impacts.	Safety lighting would be utilized for the proposed project. Only the intersections would be lit; the rest of the roadway would remain dark. Lights may be installed along the shared use path in certain locations. This information has been added to the Visual and Aesthetic Resources section in the Final EIS (Section 3.12)
City of Austin	The Lady Bird Johnson Wildflower Center has a lookout tower that was not used as a viewpoint in the study, but perhaps is the most frequently visited sited with established views of the proposed project. Although it is just outside of the study area, this would have been the appropriate site to analyze view impacts and it should be used based on current usage and impacts to those users.	The Lady Bird Johnson Wildflower Center's lookout tower has been included as an additional key viewpoint in the visual impacts analysis (Section 3.12).
City of Austin	Based on the amount of developable land available in the AOI; does this analysis characterize WQPL as developable? It is not.	Water Quality Protection Lands are not characterized as developable land; they are classified as protected open space (undevelopable land).
City of Austin	Please identify the local planning experts that "maintain that much of the planned development in the area will occur regardless of	This statement refers to responses to a questionnaire sent to local and regional land use planning agencies and organizations in November 2013. Information clarifying this has been included in this section in the Final Environmental Impact Statement. The full list of

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	whether or not the proposed project is constructed" and provide their justification for that statement.	respondents and their general responses are included in the Indirect Impacts Technical Report (Appendix D).
City of Austin	"Based on the amount of developable land available in the AOI"; does this analysis characterize WQPL as developable? It is not.	Water Quality Protection Lands are not characterized as developable land; they are classified as protected open space (undevelopable land).
City of Austin	Pollutant removal for parameters other than TSS has not been quantified, and stated pollutant removals for other constituents of concern in Section 3.6 are lower than those for TSS. Thus, the statement that the project is "predicted to improve the existing quality of recharge entering the aquifer..." is not supported and not valid.	Total suspended solids is a regulated constituent under the Edwards Aquifer Rules, and is thus the focus of the regulatory discussion. The effects of total suspended solids removal best management practices on other constituents is discussed in the Final Environmental Impact Statement (Appendix H--Water Quality and Aquatic Resource Protection Technical Report).
City of Austin	Not all of the area of influence are within the areas regulated by the City of Austin under the Save Our Springs Ordinance, and the Balcones Canyonland Permit only applies within Travis County and the City of Austin. The assertion that these regulating tools will result in no additional water quality impacts from induced development within the area of influence (which includes area in Hays County) is thus not supported and not valid.	Section 4.1 of the Environmental Impact Statement states, "Existing regulatory processes would provide controls to minimize potential adverse water quality-related impacts to threatened or endangered species. Impacts to individuals or habitat of federally listed species are subject to federal regulations under the Endangered Species Act. The City of Austin and Travis County's Balcones Canyonlands Conservation Plan, in addition to the Hays County Regional Habitat Conservation Plan, are potential permitting mechanisms available to developers to facilitate compliance with the Endangered Species Act in the area of influence. In addition, the Save Our Springs ordinance limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites by others in the Barton Springs Zone." These regulations apply to areas within the area of influence and provide protections as regulatory requirements applicable to future potential developers that propose projects within the area of influence. This statement does not assert that all of the area of influence is within the areas regulated by all of these processes. This statement also does not assert that these regulating tools will result in "no additional water quality impacts". Editorial clarifications added.
City of Austin	As identified in the referenced Herrington and Hiers 2010 (see Groundwater Impacts section), the water quality of Barton Springs is degrading over time. This indicates that the existing regulations including Texas Commission on Environmental Quality Edwards Rules are not sufficient to preclude impacts to sensitive aquatic resources including the Edwards Aquifer. The proposed project would have direct and indirect impacts to the Edwards Aquifer and would exacerbate on-going water quality degradation of endangered species habitat and thus constitute unpermitted take of endangered species.	The cited reference shows degrading trends for several, but not all, water quality parameters. Many of the constituents with degrading trends are associated with the geochemical dynamics of the aquifer and contributions from the saline zone. See detailed analysis in Appendix D - Indirect Impacts Technical Report and Appendix I - Cumulative Impacts Technical Report with regard to water quality and endangered species issues.

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City of Austin	The proposed project includes addition of a level of impervious cover that does not comply with the City of Austin's development regulations over the Edwards Aquifer, which are the only non-degradation development ordinance in effect over the Edwards Aquifer. Additionally, area within the AOI is not regulated by the City of Austin. Thus, assertions that the proposed project would not contribute directly to substantial cumulative impacts is not supported. Additionally, the proposed project impact assessment does include the potential impacts of the other planned roadway projects over the Edwards Aquifer, and thus the DEIS is not a complete analysis.	The proposed project would take place within state-owned right-of-way and is not required to comply with the City of Austin Land Development Code. A Water Pollution Abatement Plan would be prepared for the proposed project and would address potential impacts to water quality and quantity associated with karst features. Approval of the Water Pollution Abatement Plan by the Texas Commission on Environmental Quality would be required before initiation of project construction. As shown in Figure 5-1 (Indirect Impacts Technical Report), some of the area of influence is governed by City of Austin Land Development Code regulations should development be proposed by others, and additional municipalities have regulations that would apply within their jurisdictional boundaries (See Section 8.4 of the Indirect Impacts Technical Report - Appendix D for various surrounding municipal codes). Additionally, the proposed project itself has limited direct impacts and has limited potential to induce development especially due to the extensive Water Quality Protection Lands surrounding the project area. Other projects considered in the analysis are detailed in Section 7.0 of the Cumulative Impacts Technical Report. This information was based on the best available data. The impervious cover analysis was an extensive investigation of change over time and acknowledges that growth in impervious cover did occur between 1970 and 2012. The project analysis recognizes some minor contribution to cumulative impacts.
City of Austin	The statement "These regulations and plans would apply to all other developments occurring within the AOI, providing regulatory means by which significant environmental impacts caused by development would be minimized." is not valid. Only the City of Austin has a non- degradation development ordinance in place, which does not cover the entire area of influence for the project.	The statement "These regulations and plans would apply to all other developments occurring within the area of influence, providing regulatory means by which significant environmental impacts caused by development would be minimized" was be edited to state "These regulations and plans would apply to developments proposed by others occurring within the area of influence and Resource Study Areas, where applicable, providing regulatory means by which substantial environmental impacts caused by development would be minimized."
City of Austin	The DEIS correctly identifies that the proposed project would contribute to cumulative impacts. Because of the lack of quantification of impacts for constituents of concern other than TSS, the statement that the project will not contribute to significant cumulative impacts is not supported and invalid.	The Draft EIS states the following: "...may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Golden-cheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable projects." Total suspended solids is the constituent used to determine compliance with current applicable water quality protection regulations. The Draft EIS and Final EIS include discussion of the effects of total suspended solids treatment on other constituents of concern.

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City of Austin	The DEIS notes that incremental impacts will occur to endangered species. Any impacts constitute take of endangered species and are subject to regulation under the federal Endangered Species Act.	The referenced section of the Draft EIS notes that, based on the analysis in the Cumulative Impacts Technical Report, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Golden-cheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable future projects. See the following technical reports for additional information: Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report; Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas; and Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. These regulations and plans would apply to all other developments occurring within the AOI, providing regulatory means by which significant environmental impacts caused by development would be minimized.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Based on the analysis in the Cumulative Impacts Technical Report, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Goldencheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable projects. This determination is supported by several	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural

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	factors, including: limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction; the incremental contribution the proposed roadway would make toward induced development in the AOI; and the continuing trends of land use development and conservation initiatives underway within the RSAs.	resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	The preferred alternative does not meet the non-degradation goal stated by TxDOT staff during meetings with the City of Austin and early technical work groups and expressed as a critical requirement by the City of Austin and other stakeholders.	The Texas Commission on Environmental Quality's standards are non-degradation of water quality. TxDOT will exceed the Texas Commission on Environmental Quality's Edwards Aquifer Rules requirements regarding water quality.
City of Austin	The preferred alternative does not minimize the impacts to water quality protection lands and karst features to the maximum extent practicable. Significant karst features will be directly impacted by the project. The project will contribute to degradation of water quality and quantity in the Edwards Aquifer and thus constitutes unpermitted take of endangered Barton Springs and Austin Blind salamander species.	The project would not require any right of way, easements, or disturbance on City of Austin Water Quality Protection Lands. Impacts to sensitive karst features have been minimized. Based on karst feature surveys, the proposed alignment has been adjusted to avoid direct impacts to any sensitive karst features and to minimize impacts to surface drainage basins of these features. TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements. These best management practices combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Storm Water Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the following technical reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
City of Austin	Impacts to water quality protection lands and surrounding neighborhoods are not mitigated by placement of the road within existing right-of- way. Visual and noise impacts extend beyond the right-of-way.	Noise impacts were modeled for receivers adjacent to the proposed project right-of-way. The results of this analysis are discussed in Section 3.5. Visual impacts are analyzed in Section 3.12. The key viewpoints analyzed for visual impacts are also located outside the right-of-way.
City of Austin	This section needs to include information about how long the construction process may take and the air emissions from construction equipment operation, specifically NO2.	Much of the information needed to perform construction emission modeling is unavailable at the time of the project decision and is therefore not reasonable or feasible to predict; however, construction contractors must comply with all local, state and federal laws, which can include getting individual air quality construction permits. The construction contractors are responsible for complying with all of TxDOT's specification requirements (which incorporate dust suppression activities). TxDOT also encourages contractors to apply for Texas Emissions Reduction Plan funding to reduce diesel exhaust emissions; however, TxDOT cannot mandate the use of this voluntary program or they become ineligible to use it. Overall, due to the temporary and transient nature of construction activities in association with the mitigations measures specified, no significant emissions of any National Ambient Air Quality Standards or Mobile Source Air Toxins are anticipated from these construction activities.

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City of Austin	Noise impacts to R8 should receive some sort of mitigation <$25,000 in value.	TxDOT regulations specify that any mitigation for a noise impact must meet two criteria: 1) the noise abatement measure must be feasible in that it is able to reduce the noise level at greater than 50 percent of impacted 1st row receivers by at least 5 dBA, and 2) the abatement measure must be reasonable in that it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least 5 dBA and the abatement measure must be able to reduce the noise level for at least 1 impacted 1st row receiver by at least 7 dBA. The noise abatement measures considered did not meet the 2nd criterion for impacted receiver R8. Therefore, no noise abatement measures are proposed for this receiver.
City of Austin	No details are provided on the type or frequency of water quality monitoring that would be included in the Environmental Compliance Management plan. Please provide details of what monitoring will occur and how monitoring data will be used to validate or adaptively manage construction activities to eliminate impacts to water quality.	Monitoring and maintenance plans would be developed as part of the project's Plans, Specifications, & Estimates phase and included in the resulting documents (e.g. Storm Water Pollution Prevention Plan, Water Pollution Abatement Plan, Environmental Permits, Issues, and Commitments, and Environmental Compliance Management Plan).
City of Austin	What authority will the independent compliance manager have to stop or modify work? What are the goals of the Environmental Compliance Management program?	The Environmental Compliance Manager would oversee construction activities and coordinate responses to environmental incidents. The Environmental Compliance Manager would be a third party not employed directly by the construction firm and would not be subject to removal without TxDOT/Central Texas Regional Mobility Authority concurrence. The Environmental Compliance Manager would have the authority to stop construction activity in response to emerging environmental situations on the proposed project site. The Environmental Compliance Manager would perform or oversee water quality monitoring in Bear Creek, and would perform or oversee inspection of best management practices to ensure proper function. The Environmental Compliance Manager would also provide adaptive management proposals to remedy perceived best management practice inadequacies including the authority to add additional best management practices as necessary.
City of Austin	Void mitigation protocols used for the proposed project should follow those in the Optional Enhanced Measures for complying with the Edwards Rules (RG-348a) to be protective of sensitive karst features.	The project will carry out void mitigation in accordance with current regulatory requirements. The measures to protect sensitive features encountered during construction in Texas Commission on Environmental Quality's RG-348a (Optional Enhanced Measures) are the same as those in RG-348 (Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices). The measures require encountered features to be filled with gravel and at least 18 inches of concrete. TxDOT would evaluate each feature that is encountered during construction in compliance with Texas Commission on Environmental Quality guidance. Additionally, the likelihood of encountering a feature during construction has been minimized as excavation would be limited.
City of Austin	No discussion of the type of vegetation that will be used in the vegetative filter strips or in disturbed areas requiring revegetation is presented. The City recommends all areas be revegetated with native species and recommends the City of Austin standards specification 609s for revegetation or specify the method and type of native vegetation that will be utilized.	Vegetated filter strip and re-vegetation policies are discussed separately. The vegetated filter strip discussion focuses on studies that cite treatment efficiencies. Largely, these studies do not specify species composition. Re-vegetation would be carried out in accordance with TxDOT standard guidance, design goals, and native species use as described in Appendix H of the Environmental Impact Statement.

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City of Austin	Inconsistent specifications for pesticide use appear in the document. In some sections, it is stated that no pesticides will be used but in other sections state application is limited. Please clarify. Please prohibit the application of any pesticides and fertilizers within the project area.	Pesticides are mentioned as a pollutant and avoidance of using pesticides is discussed in several places (Sections 3.7.2, 6.5.1, Appendix D, Appendix H). Discussion of pesticides in the Final EIS has been edited for consistency. Pesticides are defined by TxDOT as any chemical or biological agent that kills plant or animal pests, herbicides, insecticides, fungicides, rodenticides, etc. are all pesticides. TxDOT's roadside pest management program addresses pest management issues. In general, pesticides are only used adjacent to the roadside. Pesticides would not be used within natural buffers protecting sensitive karst features.
City of Austin	This bullet statement is confusing and appears to be contradictory: "Mowing schedule according to native and non-preferred vegetation seed propagation"	Bullet statement has been deleted in Final EIS.
City of Austin	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable.	It is unclear what the comment is referring to when it mentions "U.S. Environmental Protection Agency guidance and case law." The term "maximum extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	"In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1, per the plan sheets." How would they prevent birds from building nest? This might constitute harassment of a listed species which is prohibited by the Endangered Species Act.	Existing structures can be protected from nest establishment by various measures, such as netting or other means of interference with establishment of nests that does not result in death or injury to adults. Nesting deterrents should be placed in appropriate locations by February 15. Contractors would be allowed to use exclusion devices, nesting prevention measures, or removal and disposal of partially constructed and unoccupied nests of migratory birds on a regular basis to prevent their occupation. All methods would be approved by the Austin District Biologist well in advance of planned use.
City of Austin	The project as stated in the DEIS impacts the quality and quantity of water recharging the Edwards Aquifer and thus impacts the endangered Barton Springs Salamander and the endangered Austin Blind Salamander species. This could constitute take of federally protected species.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules regarding water quality. As designed, the proposed best management practices would exceed treatment requirements. In addition, the retention of stormwater runoff and gradual release from water quality ponds would maintain the quantity of water recharging to the aquifer. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Storm Water Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas and report titled Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.

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City of Austin	Because of the lack of quantification of impacts for constituents of concern other than TSS, the statement that the project will improve the quality of water recharging the Edwards Aquifer is not supported and invalid.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for the proposed project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements and decrease loads of total suspended solids to levels below those recognized as background for undeveloped areas (i.e. existing conditions). Therefore, the statement is factual as stated. Additionally, there is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described in the Environmental Impact Statement for pollutants other than total suspended solids.
City of Austin	The stated void inspection procedures do not include mitigation procedures, and are not compliant with the Texas Commission on Environmental Quality Optional Enhanced Measures for the Edwards Aquifer (RG-348a)	The project would carry out void mitigation in accordance with current regulatory requirements. The measures to protect sensitive features encountered during construction in Texas Commission on Environmental Quality's RG-348a (Optional Enhanced Measures) are the same as those in RG-348 (Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices). The measures require encountered features to be filled with gravel and at least 18 inches of concrete. TxDOT would evaluate each feature that is encountered during construction in compliance with Texas Commission on Environmental Quality guidance. Additionally, the likelihood of encountering a feature during construction has been minimized as excavation would be limited.
City of Austin	The draft EIS states that there is no suitable GCWA habitat within the ROW, based on the 2014 surveys. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance	It is inappropriate to discuss the amount of potential Golden-cheeked Warbler habitat from the Texas A&M University habitat map without examining the demographic model. Texas A&M University estimated the amount of mixed woodland patches using remotely-sensed imagery and Geographic Information Systems layers. This map – it is not a model – is independent of any warbler surveys used to obtain the occupancy and abundance estimates. This map delineates all potential mixed woodland that could serve as warbler habitat during the breeding season. The original objectives of the Texas A&M University occupancy and abundance models were to estimate breeding population size of male warblers across the species' breeding range using a predictive model that incorporated range-wide predictor variables. Texas A&M University provided City of Austin with patch-specific abundance estimates for properties within the Balcones Canyonlands Preserve with several caveats about the proper use of these estimates. Texas A&M University explained that the predicted density estimates are based on a regression model that was developed at a much larger scale than the Balcones Canyonlands Preserve. As such, predictions from the model at a local scale will result in some bias in point estimates, causing estimates from other methods to be either higher or lower. Furthermore, Texas A&M University made no assertions that the predictor variables used at the range-wide scale are the best models to describe the species-habitat relationship at this local scale. See the Final Draft: State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report

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	within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.	for further discussion of the Golden-cheeked Warbler and its habitat in the vicinity of the project.
City of Austin	Section 6.6.2 does not address mitigation of impacts to Golden-cheeked Warbler habitat and BCCP karst zones 1 and 2.	The project is in Balcones Canyonlands Conservation Plan karst zones 3 and 4. No Golden-cheeked Warbler habitat nor Balcones Canyonlands Conservation Plan karst zones 1 and 2 areas would be impacted by the proposed project; therefore, no mitigation is required. See State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report and Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas for additional information.
City of Austin	States that no habitat ranges for listed karst species overlap with the project area. There is currently a collection of Texelis reyesii from Barker Ranch Bat cave within the evaluation area.	The standing expert on the species, Darrell Ubick of the California Academy of Sciences, has studied specimens from Barker Ranch Cave No. 1 and concluded that these specimens likely belong to Texella mulaiki. Based on this result it was concluded that the listed species, T. reyesi, does not occur in the project area. Additional information provided in Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas and Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.
City of Austin	No mention of the contractor providing hazardous materials "awareness training" for all staff performing grading and/or excavation on how to identify and manage suspected contaminated soil or groundwater that might be encountered. Only a small reference is made to training under Hazardous Materials Spill Protocols (App. H 4.1.5 Spill and Hazardous Materials Management)	Details of the Environmental Compliance Management Plan would be further developed in the Plan Specifications & Estimate phase of the project.
City of Austin	The project would be constructed on fill and thus elevated, which would result in visual and aesthetic impacts to surrounding areas which were not evaluated by the DEIS.	Section 3.12 of the Draft EIS addresses the project's potential visual impacts. The visual impacts analysis in the Final EIS has been updated to reflect the fact that the roadway would be constructed on fill.
City of Austin	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered Impacts to visual and aesthetic resources would be minimized to the maximum extent practicable during the final design of the proposed project.	It is unclear what the comment is referring to when it mentions “U.S. Environmental Protection Agency guidance and case law.” The term “maximum extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc. Analysis of and mitigation for visual and aesthetic impacts follows Federal Highway Administration guidelines (Section 3.12).
City of Austin	Priority viewpoints do not include a frequently used viewpoint at the Lady Bird Johnson Wildflower Center.	The visual impacts analysis (Section 3.12) has been updated to include the San Antonio Tower at the Wildflower Center.
City of Austin	There is no typical section for the segment(s) that will include the diversion berm and bentonite soil cap near Flint Ridge Cave.	The berm has been removed from the project design. The roadway design has been modified to move the alignment further away from Flint Ridge Cave such that the berm will not be required. The Final Environmental Impact Statement includes a discussion of the redesign in Section 3.3.1.

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City of Austin	Sheet 5 depicts diversion berm with a breach for wildlife /pedestrian crossing within Flint Ridge Cave basin and ~ 500' from Flint Ridge Cave opening. How will this effectively divert polluted roadway runoff away from Flint Ridge Cave?	The berm has been removed from the project design.
City of Austin	AASHTO guidance suggest that the following be used for documenting indirect impacts. The DEIS falls short of following this guidance. Explain the Methodology. Just as important as selecting a reasonable methodology is the importance of clearly explaining why that methodology was selected. The advantages and disadvantages/drawbacks of the methodology should be acknowledged, not ignored. Provide Factual Support. The evaluation of trends and conclusions about environmental consequences should be based on up- to-date factual information. Graphs, tables, and other graphic elements should be incorporated, where appropriate, to aid readability. Use Clear Reasoning. The conclusions of the assessment should be supported by logical analysis and plausible reasoning, and not contain internal inconsistencies or contradictions that put the results into question. It also is important to document the uncertainties involved in the analysis, explain the importance of those uncertainties, and explain how they have been addressed. Legal Sufficiency Criteria. For a more detailed list of factors to consider in assessing the legal sufficiency of indirect effects and cumulative impacts analyses, refer to Appendix 1A (indirect effects) and Appendix 1B (cumulative impacts). These lists also are based on the recommendations in the NCHRP report, Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents (2008).	American Association of State Highway and Transportation Officials guidance was one of the documents used to form the foundation for both the Indirect and Cumulative Impacts Technical Reports. The Guidance sections of each Technical Report explain the organization and approach for preparing each analysis. Planning Judgment, Collaborative Judgment, and Cartographic Analysis are valid methodologies for conducting Indirect and Cumulative Impact Analyses, and were particularly useful for this project in order to capture professional feedback from more than a dozen entities who responded to the project questionnaires. Extensive mapping was conducted to measure and depict impervious cover over time in the Groundwater Resource Study Area, with a detailed methodology appendix included. Tables and Figures are used for assessment of all resource categories, and various planning and vision maps and tables are included in the Cumulative Impacts Technical Report to illustrate how this project was analyzed with respect to other projects and plans. Factual support has been provided as evidenced in the 100+ technical citations provided for the two reports. This analysis explains the methodology, provides factual support, uses clear reasoning, and meets the keys to legal sufficiency also identified in TxDOT's Guidance, including knowing the difference between indirect and cumulative impacts, making a good faith effort to explain impacts, engage partners, and have record support.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Table 4-2 EJ groups are comprised of vulnerable populations, including minorities and low income persons. TxDOT follows principles in E.O. 12898 and Title VI to provide protections for EJ populations. Project-induced growth is not anticipated to have a significant effect on neighborhoods, including those in EJ communities. Displacements from project induced growth are not anticipated.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural

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		resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	The proposed project would directly impact the subsurface catchment area for Flint Ridge Cave and thus directly impact the species of concern that live in Flint Ridge Cave. Additional karst features would be directly impacted by the project, thus indirectly impacting Barton Springs. Expand the Area of Influence to include Barton Springs and evaluate the impacts on that valued and unique environmental resource.	The project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave and other sensitive features through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection Best Management Practices. A report titled Ecological Integrity of Flint Ridge Cave has been completed for this project and is included in the Final Environmental Impact Statement. The report evaluates the potential for adverse effects to the ecological integrity of Flint Ridge Cave from the construction and operation of the proposed SH45 SW project. Based on site characteristics and proposed avoidance and minimization measures, the ecological integrity of Flint Ridge Cave is likely to be maintained. In addition, it is unlikely that significant impacts to the Flint Ridge Cave surface or subsurface drainage basins would occur. The findings indicate that construction of the proposed project is not likely to impact the Balcones Canyonlands Conservation Plan and species of concern found within Flint Ridge Cave. The area of influence developed for this project is appropriate. A description of how the area of influence was developed is included in the Indirect Impacts Technical Report included in the Draft EIS and the Final EIS.
City of Austin	The proposed project would indirectly impact the Barton Springs and Austin Blind salamander species by decreasing recharge to the aquifer and by increasing pollutant loading to the aquifer.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules regarding water quality. As designed, the proposed best management practices would exceed treatment requirements. In addition, the retention of stormwater runoff and gradual release from water quality ponds would maintain the quantity of water recharging to the aquifer. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation and report titled Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
City of Austin	Table 4-2 Does not consider cumulative impacts with respect to other TxDOT/CTRMA projects including Mopac intersections, Mopac South, and Oak Hill Parkway because the AOI is inadequately defined. Nor does it address changes to runoff and recharge in connection with other development in the AOI or provide a robust AOI. Instead it seems to describe effects as diminimus because of other development.	Table 4-2 in the Indirect Impacts Technical Report is not intended to cover cumulative impacts. The table "includes a description of resources analyzed for potential indirect impacts from induced development, including consideration of encroachment issues." The table identifies whether or not a resource is at risk and if so, that resource is analyzed in detail in subsequent sections of the Indirect Impacts Technical Report (including surface and groundwater resources). Subsequent sections especially Section 7.0 include a robust analysis of potential development within the area of influence including the results of the expert questionnaire, followed by minimization and mitigation techniques and regulatory requirements in Section 8.0. The area of influence is defined as the area most likely to be subject to indirect impacts such as induced development and none of the experts interviewed recommended that the area of influence boundaries be changed. Larger Resource Study Areas are addressed in the Cumulative Impacts Technical Report.

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City of Austin	Include a statement about air quality impacts resulting from construction equipment - PM and NO2.	Much of the information needed to perform construction emission modeling is unavailable at the time of the project decision and is therefore not reasonable or feasible to predict. The construction contractors are responsible for complying with all of our specification requirements (which incorporate dust suppression activities). TxDOT also encourages contractors to apply for Texas Emissions Reduction Plan funding to reduce diesel exhaust emissions, but we cannot mandate the use of this voluntary program or they become ineligible to use it. Also, construction contractors must comply with all other local, state and federal laws, which can include getting individual air quality construction permits. Due to the temporary and transient nature of construction activities in association with the mitigations measures specified, no significant emissions of any National Ambient Air Quality Standards or Mobile Source Air Toxins are anticipated from these construction activities. In addition, a hot-spot analysis required under the Clean Air Act, which would only apply to a nonattainment area, construction emissions are only modeled if the construction activities are anticipated to last more than 5 years. We would not expect this construction to last nearly that long. TxDOT would not expect that we would be subject to more stringent requirements in an attainment area than we would be in a nonattainment area. However, since the area is attainment or unclassifiable for all National Ambient Air Quality Standards, including nitrogen dioxide, none of U.S. Environmental Policy Act's conformity rule requirements apply to this project.
City of Austin	Obtain more updated well locations from the Barton Springs Edwards Aquifer Conservation District	Project team has obtained this data and incorporated it into the Final EIS.
City of Austin	Figure 4.1 Spring data is incomplete. Springs on Marbridge and on WQPL Tabor tract are not depicted.	Updated spring data has been obtained from the Barton Springs/Edwards Aquifer Conservation District and incorporated into the Final Environmental Impact Statement. These data include the springs on the Marbridge and Water Quality Protection Land Tabor tracts, as shown on Figure 4.1 in the Indirect Impacts Technical Report (Appendix D of the Final EIS).
City of Austin	The DEIS cites Imagine Austin and City of Austin water quality regulations, but the proposed project does not conform to those regulations. Explicitly note that the proposed project does not conform to the City of Austin comprehensive plan or Land Development Code.	The Draft EIS acknowledged that the proposed project was removed from the Imagine Austin plan (see Land Use, Local Plans and Policies section).
City of Austin	The DEIS cites the City of Austin Habitat Conservation Plan for the Operation and Maintenance of Barton Springs Pool, and identifies a goal of that plan is to reduce anthropogenic pollutants impacts to salamanders and their habitat. The proposed project does not comply with this goal as it will reduce the quantity and quality of recharge to the aquifer, and this should be identified in the DEIS.	See Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. The suite of best management practices included in the proposed project would act to decrease stormwater pollutant loads and increase recharge as described in the Final EIS/Appendix H.

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City of Austin	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered Maintain or restore natural ecosystem characteristics of Barton Springs and the Austin blind salamanders habitat to the maximum extent practicable	It is unclear what the comment is referring to when it mentions "US Environmental Policy Act guidance and case law." The term "maximum extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered Restore and maintain natural flow regimes in Barton Springs Pool, Eliza Spring, Old Mill Spring, and Upper Barton Spring to the maximum extent practicable	It is unclear what the comment is referring to when it mentions "US Environmental Policy Act guidance and case law." The term "maximum extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Section on BCCP does not describe permit commitment to protect 62 caves, including Flint Ridge.	The following statement was added to Section 5.1 in Appendix D: "The Balcones Canyonlands Conservation Plan includes the goal of protecting 62 caves including Flint Ridge Cave."
City of Austin	Documents BCP efforts to protect 30,428 ac of bird habitat but fails to address BCCP goal of protecting 62 caves and karst feature that provide habitat for 6 listed Karst invertebrates and 26 karst species of concern.	The following statement was added to Section 5.1 in Appendix D: "The Balcones Canyonlands Conservation Plan includes the goal of protecting 62 caves including Flint Ridge Cave."
City of Austin	Include impacts to karst features resulting in loss of recharge quantity as an impact causing activity	See Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of sensitive features through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices. In table 6-1, impacts to karst features with respect to recharge capacity is included in "modification of regime - alteration of surface drainage."
City of Austin	Include visual impacts from elevation of the roadway because construction will occur on substantial amounts of fill material as an impact causing activity	The visual impacts analysis (Section 3.12) has been updated to include fact that roadway would be elevated on fill.
City of Austin	Sand cannot be used as a de-icing material on permeable friction course without adverse impacts to pollutant removal efficiencies.	Comment noted. Permeable Friction Course used on the proposed SH 45SW would be maintained as appropriate. TxDOT standard practice regarding deicing is only to deice bridges, which would not be constructed of Permeable Friction Course.
City of Austin	Figure 7.1 inaccurately depicts WQPL. Does not include 500 +/- acre acquisition from Avana.	Figure has been updated with most recent Water Quality Protection Land acreage.
City of Austin	The Area of Influence defined for the project is not adequate. The project directly and indirectly affects the Barton Springs Segment of the Edwards Aquifer as stated in the DEIS. AOI boundaries should be expanded to include all of the Edwards Aquifer	The area of influence is limited to the area where induced development could potentially occur. The Resource Study Area is much larger and includes these areas of concern; cumulative impacts analysis is focused on the resource in question so the cumulative impacts section is the appropriate place for this larger analysis area.

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	recharge zone from the project area north to Barton Springs and the Colorado River (Lady Bird Lake). Adjust the AOI accordingly, and reevaluate the indirect impacts.	
City of Austin	Table 7.2. Describes Obar ranch as 1500 ac of potential development. Does not acknowledge that this tract is encumbered with a conservation easement that limits impervious cover to 1.7% gross area and only allows it to be subdivided into 15 parcels.	Table 7-3 shows O-Bar Ranch as "New subdivision – 15 lots (100 acres each) in accordance with City of Austin and Nature Conservancy development restrictions". The table is intended to disclose general information about known potential developments rather than the details of those developments. The table indicates projects that are known that could potentially increase impervious cover, acknowledging that there is a continuing trend of development in the study area.
City of Austin	This section does not address loss of recharge due to directly impacted karst features and loss of subsurface catchment area. Loss of recharge to the aquifer constitutes take of endangered salamander species.	See the following technical reports: Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. Geologic Assessment of the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Texas Department of Transportation Right of Way, Travis and Hays Counties, Texas. Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices.
City of Austin	Klenzendorf et al. 2011 is a PowerPoint presentation, and should not be cited as a technical reference.	Data cited are from the published source: Eck, B.J., et al. 2012. Water Quality of Drainage from Permeable Friction Course. Journal of Environmental Engineering, volume 138. no. 2.
City of Austin	Klenzendorf et al. 2011 shows less than 96% removal rates for permeable friction course for some metals, and shows export of nitrate from permeable friction course which is not addressed by the DEIS. This suggests that TSS alone is not an appropriate surrogate for all runoff constituents of concern.	Total suspended solids is the constituent used to determine compliance with current applicable water quality protection regulations. Therefore, its use in this setting is appropriate. The Draft EIS includes discussion of the effects of total suspended solids treatment on other constituents of concern.
City of Austin	"Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Standard, 2008) can be removed from highway runoff as it passes through these permeable road layers". What is the fate of these contaminants once they are removed by PFC. At what point does PFC become "saturated" with filtered contaminants? Does PFC ever discharge filtered contaminants. Is TxDOT assuming that PFC will continuously and perpetually accumulate contaminants without reaching capacity? When maintenance is done to the road surface what are the plans to	All future maintenance (construction activities) would be subject to water quality protection regulations. Maintenance plans would be further developed in the Plan Specifications & Estimate phase of the project.

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	capture and retain contaminants held in the PFC so that it is not discharged as a slug of accumulated pollutants at one time? These issues should be addressed before assuming the long term benefits of PFC.	
City of Austin	That conclusion that no adverse impacts to Barton Springs will occur is not supported. The distance of the project from Barton Springs is not relevant as City of Austin dye studies indicate rapid travel times from the project to Barton Springs and little to no subsurface attenuation of contaminants. Additionally, analysis only of TSS and not of other pollutants or loss of recharge was conducted in the DEIS to support this conclusion.	See Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. As described in the Draft EIS, the suite of best management practices included in the proposed project would act to decrease stormwater pollutant loads and increase recharge. The effects on numerous constituents of concern of stormwater treatment for total suspended solids reduction are also described.
City of Austin	The DEIS correctly identifies that some pollutants including metals would not be removed by the proposed BMPs. The DEIS incorrectly concludes that these will have no adverse impacts because of the hardness of Barton Springs water. Only a quantitative analysis of the pollutant concentrations relative to the Texas Commission on Environmental Quality aquatic life criteria for toxic substances can be used to make such an assertion.	Information is provided regarding published studies of the effects of best management practices (BMPs) on metal concentrations in stormwater runoff. Table 3.6-7 and Table A.5-1 in Appendix H show that BMPs lower metal concentrations. Possible toxic effects of remaining metal loads are discussed in the Final EIS and, as part of that discussion, information is presented regarding the effects of water hardness on the bioavailability of metals, specifically that as hardness increases, bioavailability decreases. In this discussion, the EIS states that “possible effects of heavy metal constituents would be reduced by the use of BMPs and further diminished by natural chemical processes.” Each statement is valid as presented.
City of Austin	"Because of the engineered BMPs that would allow for a TSS removal rate of at least 90 percent, the distance from the proposed project to Barton Springs, and the relatively small amount of stormwater that would recharge from the project area to the Edwards Aquifer, no adverse impact to springs would be expected with the proposed project." Where are the calculations/estimates on recharge occurring relative to project. Because this area has a very high concentration of karst, its relative contribution to recharge is likely higher than the assumptions used to generate this statement.	See Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas and the Biological Evaluation. Given the uncertainties of diffuse, upland recharge efficiencies, the project team has focused on developing a suite of best management practices that would act to decrease stormwater pollutant loads and increase recharge potential in the interest of protecting recharge water quality and quantity.
City of Austin	No subsurface catchment area impacts for Flint Ridge Cave are assessed by the DEIS.	See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas. The subsurface catchment area has been studied and results are included in the report titled: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. This report is included as an attachment in the Final EIS. The results indicate that the ecological integrity of Flint Ridge Cave would be maintained. Construction of the proposed project is not likely to impact the Balcones Canyonlands Conservation Plan Species of Concern found within Flint Ridge Cave.

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City of Austin	The project is not compliant with the City of Austin Save Our Springs Ordinance and does not achieve non-degradation standards.	The project would comply with applicable regulatory standards and would exceed those standards in many instances. TxDOT is committed to adhering to state regulations, including state water quality standards. The proposed project, if constructed would be in compliance with the Texas Commission on Environmental Quality Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements.
City of Austin	No evaluation of the dilution of pollutants in the aquifer was conducted in the DEIS. The conclusion that minimal amounts of pollutants would enter the aquifer is not specific and should be quantified. What are acceptable amounts of pollutants that can enter the aquifer?	The discussion of water quality is presented within a thorough representation of the aquifer system which includes existing stored water which would result in a diluting effect; however, the project has been designed to decrease pollution loads and increase recharge potential. In section 3.1.2of Appendix H of the Draft EIS, the following is provided: "The goal of the Edwards Aquifer Rules is that the existing quality of groundwater not be degraded, a goal which is consistent with the goal of groundwater policy in the state of Texas (Texas Water Code §26.401). The Texas Water Code also states that the goal of non-degradation does not mean zero-contaminant discharge." The proposed project if constructed would be in compliance with the Edwards Aquifer Rules. As designed, the proposed best management practices would exceed treatment requirements.
City of Austin	The goal of the Edwards Rules is non-degradation of existing groundwater quality (30 TAC 213.1). The project does not comply with this goal as existing groundwater quality will be degraded by the proposed project.	In section 3.1.2 of Appendix H of the Draft EIS, the following is provided: "The goal of the Edwards Aquifer Rules is that the existing quality of groundwater not be degraded, a goal which is consistent with the goal of groundwater policy in the state of Texas (Texas Water Code §26.401). The Texas Water Code also states that the goal of non-degradation does not mean zero-contaminant discharge."
City of Austin	"The limits of the berm would extend far enough beyond the cave watershed to ensure there is no chance for untreated runoff to enter the cave. In addition, since the Build Alternative would remove a portion of its watershed, surface flow from an equivalent area would be re-routed to the Flint Ridge Cave drainage area to mitigate for the area being removed. “there has been no discussion of the indirect effect of covering the surface and disrupting very discrete recharge that is not attributable to visible features and openings.	The berm has been removed from the project design. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas. Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices.
City of Austin	"Chances of contaminated water from a spill reaching Barton Springs are unlikely due in part to the implementation of hazardous material traps and filtration ponds, the distance between Barton Springs and the proposed project, and the vast volume of water in the aquifer (TxDOT, 2014)." This appears to assume that natural process in the karst aquifer will serve to remove pollutants for water recharged from the surface. This assumption is not substantiated by research and modeling included in the City of Austin's Barton Springs Catastrophic Spill Plan which was accepted by the U.S. Fish and Wildlife Service. It	The Final Environmental Impact Statement's Appendix D has been revised to state that the chances of contaminated water from a spill reaching Barton Springs are unlikely due to proposed project drainage controls (retaining wall, roadside ditch, hazardous material traps and valves on batch detention ponds). Spills on the roadway or along the roadside would be cleaned up to background levels.

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	also assumes dilutions will mitigate contamination. Since BSS and ABS are very sensitive receptors this assumption should be substantiated by calculations and data.	
City of Austin	"There are several relevant points with regard to dilution of pollutants in the groundwater: The COA "has enacted policies and made significant investments in the protection of water quality in the Barton Springs Zone of the Edwards Aquifer." So is TxDOT assuming that since COA does this elsewhere they are not obligated to?	Because much of the area of influence and the largest Resource Study Area fall within the City of Austin and their extraterritorial jurisdiction, the City's initiatives for water quality protection are recognized as effective measures to protect sensitive resources within its jurisdiction. TxDOT proposes a series of best management practices that would serve to minimize adverse water quality impacts caused by the project. In consideration of potential indirect and cumulative impacts due to this project and others in the area of influence and Resource Study Area, designers repeatedly undertook redesign efforts and technical studies to understand the environmental context of the proposed project and as a result, moved the roadway farther away from sensitive resources. These mitigated actions are part of TxDOT's concerted efforts to reduce potential contributions to indirect and cumulative impacts.
City of Austin	"The use of PFC overlays has proven to yield water quality benefits. Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008) can be removed from highway runoff as it passes through these permeable road layers." The current Texas Commission on Environmental Quality guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with Texas Commission on Environmental Quality regulations and guidance.	Infiltration via pervious concrete is not proposed as the road would be impervious. Rather a porous overlay is proposed that would filter stormwater. The subgrade of the pavement will be impervious Permeable Friction Course is an approved Texas Commission on Environmental Quality best management practice and is not the pervious concrete that is shown in RG-348.
City of Austin	"Texas' application to administer NPDES. EPA states:" - This section discusses increased monitoring and improved standards expected from the state but does not reveal whether those changes have ever been used successfully to achieve the level of protection proposed. This assumption by TxDOT is not backed by data.	This section describes that the US Environmental Policy Act, via consultation the US Fish and Wildlife Service, agreed that construction activities, as regulated by the Texas Pollutant Discharge Elimination System permit, would be unlikely to jeopardize listed species. And furthermore describes how the Clean Water Act can and will act to increase the protection of listed species in Texas.
City of Austin	This section inadequately describes indirect effects on Golden-cheeked Warblers. It does not address indirect effects on habitat adjacent to the ROW, habitat fragmentation, introduction of predators and other invasive species, and noise impacts.	See State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report, which is an attachment to the Biological Evaluation (Appendix M of Final EIS).
City of Austin	"Golden-cheeked Warbler habitat within the AOI, approximately 13,223 acres of which fall outside of the proposed project ROW and thus have the potential to be indirectly impacted. However, 4,363 acres of this habitat, or 33 percent of it, fall within COA WQPLs and are therefore protected." There are portions of the SH45 alignment that are within 100M of occupied habitat. USFWS regulations consider this indirect effects on GCWA.	Quoted text refers to estimated/modeled habitat in area of influence outside state-owned right-of-way. See State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report which is an attachment to the Biological Evaluation (Appendix M of Final EIS) for additional information on indirect impacts to this species.

Organization	Verbatim Comment	Response
City of Austin	"potential effects to groundwater resources include short-term potential for pollutants in stormwater runoff… "- Is this transient impact quantified anywhere?	Precise quantification is confounded by the complexities of the system and its elements. The proposed project includes design elements that reduce pollutant loads and increase recharge potential. This qualitative analysis is developed in the Final EIS.
City of Austin	"indirect impacts to surface water resources are not expected to be substantial." - This is not substantiated anywhere and no attempt is made to quantify indirect impacts.	Precise quantification is confounded by the complexities of the system and its elements. The proposed project includes design elements that reduce pollutant loads and increase recharge potential. This qualitative analysis is developed in the Draft EIS. The document states the following: "Given that Section 401 and Section 404 requirements under the Clean Water Act are generally applicable to public and private developments, as well as additional protections and permitting requirements over the Edwards Aquifer Recharge Zone and those promulgated by municipalities for local protection, indirect impacts to surface water resources are not expected to be substantial. However, because surface water features are located in the area of influence and convey water into groundwater recharge features, the resource will be carried forward to cumulative impacts analysis." Surface water resources are discussed in detail in the remainder of the Indirect Impacts Technical Report.
City of Austin	"...constraining the amount of growth possible in the area… "If development potential is constrained by land preservation and lack of infrastructure how are population growth projections discussed previously justified?	The population growth projections were cited from published sources. This analysis does not attempt to directly connect those projections with land use development or physical growth conditions in the study area.
City of Austin	"There are several ongoing or planned roadway projects in the AOI (FM 1626, Frate Barker Road, Manchaca Road, Old San Antonio Road bridge, proposed Escarpment Blvd extension into Hays County)" - are these considered as part of cumulative effects assessment?	These projects are mentioned in an effort to disclose reasonably foreseeable past, present, and future projects that could impact the Resource Study Area.
City of Austin	"Hill Country Conservancy (HCC) is considering purchasing certain parcels for conservation," - do they have funding to accomplish this. Does this in anyway contribute to the analysis of the DEIS.	Information from this section was provided to TxDOT by the landowner and was disclosed based on the information provided. The Draft EIS includes best available information but may be superseded over time.
City of Austin	"The BCCP was a plan written by COA and Travis County in order to obtain an incidental take permit for Golden-cheeked Warblers, Black-capped Vireos, and six species of federally-endangered karst invertebrates under section 10(a)(1)(B) of the ESA. The take covered by the permit would include take associated with..." - This section seems to infer that this project and/or new development induced by the project are mitigated by BCCP. At this point in time none are, and they are not required to participate in BCCP by any regulation. This assumption is inaccurate.	Section 8.1.1 of the Indirect Impacts Technical Report introducing the Balcones Canyonlands Conservation Plan, was revised to clarify status of Balcones Canyonlands Conservation Plan participation. The following is revised text: "The Balcones Canyonlands Conservation Plan is a permitting mechanism for compliance with the Endangered Species Act, and is one potential compliance avenue for development projects that apply and are deemed eligible to participate in the Balcones Canyonlands Conservation Plan."

Organization	Verbatim Comment	Response
City of Austin	Insufficient analysis is presented in the DEIS to support the conclusion of no take of endangered salamanders. The project would reduce the quantity of recharge to the aquifer. Only TSS load reduction was quantitatively evaluated, despite citing references that show pollutant removal for nutrient and metal constituents to be less than TSS removal. The actions could constitute take of salamanders.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules regarding water quality. As designed, the proposed best management practices would exceed treatment requirements. In addition, the retention of stormwater runoff and gradual release from water quality ponds would maintain the quantity of water recharging to the aquifer. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Stormwater Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation and report titled Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas (Appendix M of Final EIS).
City of Austin	Water Quality Protection Lands purchased by the City of Austin are not for mitigation of the proposed project impacts.	In Section 8.1.2, Draft EIS document states: "Furthermore, the City of Austin has set aside more than 26,000 acres of Water Quality Protection Lands specifically to protect the water quality within the Edwards Aquifer, which will also indirectly benefit and protect the Austin blind salamander and the Barton Springs salamander. These existing protections will help to mitigate for future impacts to the listed salamander species." This does not state that Water Quality Protection Lands were purchased to mitigate for the current project.
City of Austin	"...land set aside for the BCCP protects groundwater quality in the Barton Springs segment of the Edwards Aquifer". There is no land set aside for BCCP in the current delineation of the AOI. There is no analysis that shows that the BCCP is all that is needed to protect groundwater quality in the BSEA.	Document states: "However, land set aside for the Balcones Canyonlands Conservation Plan protects groundwater quality in the Barton Springs segment of the Edwards Aquifer, which indirectly benefits the salamanders." Statement remains true. Document does not contain a statement that the BCCP is all that is needed to protect groundwater in the Barton Springs Edwards Aquifer. The paragraph is about existing conservation lands and regulations that are beneficial to salamander species.
City of Austin	The DEIS does not specify if the proposed project will comply with the two Optional Enhanced Measures guidance documents for complying with the Edwards Rules as cited in this section. The DEIS does not specify a goal of achieving non-degradation of the Edwards Aquifer.	The project would comply with Edwards Aquifer Rules and water quality treatment would be in exceedance of 90 percent for total suspended solids. However, the project would not adhere to the Optional Enhanced Measures. The non-degradation standard as defined by the Texas Water Code and adopted by the Edwards Aquifer Rules would be met. Texas Water Code (Title 2, Subtitle D, Chapter 26, Subchapter J) states that is it the goal of groundwater policy in this state that the existing quality of groundwater not be degraded. This goal of non-degradation does not mean zero-contaminant discharge.
City of Austin	The most recent City of Austin watershed protection ordinance was passed in October 2013.	Comment noted.
City of Austin	The proposed project does not comply with City of Austin development regulations.	The proposed project does not require compliance with City of Austin development regulations. Detailed analyses for environmental constraints have been conducted including karst feature surveys and other "critical environmental features" equivalent to any that would be required for City of Austin compliance.
City of Austin	The proposed project is not consistent with the Balcones Canyonlands Conservation Plan as it directly impacts Flint Ridge Cave without providing mitigation.	Comment noted. Section 8.2 of Appendix D (Indirect Impacts Technical Report) discusses minimization and mitigation measures, including the Balcones Canyonlands Conservation Plan that would apply to development in the area of influence.

Organization	Verbatim Comment	Response
City of Austin	Although Texas Commission on Environmental Quality has a goal that groundwater not be degraded in 30TAC213, "non-degradation" is not found in the regulation nor a definition thereof. As mentioned earlier, Chapter 26.401(b) states what nondegradation is not (no increase in pollutant discharge), but not what it is. TxDOT should propose a definition or rely on COA application of the SOS ordinance.E34	The project would comply with applicable regulatory standards and would exceed those standards in many instances.
City of Austin	"The Balcones Canyonlands Conservation Plan (BCCP), a regional Habitat Conservation Plan administered by the City of Austin and Travis County, protects over 28,000 acres in Travis County as the Balcones Canyonlands Preserve. The BCCP includes requirements to protect caves and other karst features where endangered species or species of concern have been found (COA-Travis County 1996)." - - Flint Ridge Cave is one of those caves. It is not clear how the DEIS considers it protected in light of this project. The DEIS states we are required to protect and it is not stated what action the preparers are implying the BCP permittees should take.	The project has been designed and redesigned to avoid adverse impacts to Flint Ridge Cave, even though there are no federally-listed threatened or endangered species known to inhabit the cave, according to the Biological Evaluation. The redesigns have occurred to help avoid impacts to species of concern and their potential habitat. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas (Appendix M in Final EIS).
City of Austin	State if the proposed project will follow the City of Austin void mitigation procedures referenced.	TxDOT is committed to adhering to State of Texas requirements, including regulations regarding void mitigation. In the event of accidental void discovery, Texas Commission on Environmental Quality void mitigation protocol (30 TAC 213.5(f)) and guidance (RG-348, Section 5.2) would be followed.
City of Austin	The correct web address for the City of Austin codes and criteria is no longer AMLEGAL but is now: https://www.municode.com/library/tx/austin	Citation has been updated in Final EIS.

Organization	Verbatim Comment	Response
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis Counties, and the responses of local planning experts, the proposed project is not anticipated to generate significant induced development.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	Indirect effects of the proposed project directly conflict with the City of Austin Imagine Austin comprehensive plan and are not consistent with City of Austin Land Development regulations.	The Draft EIS acknowledged that the proposed project was removed from the Imagine Austin plan (see Land Use, Local Plans and Policies section).
City of Austin	The indirect effects of the proposed project would substantially worsen the condition of a sensitive resource, specifically the Edwards Aquifer and Barton Springs and habitat for endangered species, and thus additional mitigation is necessary.	The Indirect Impacts Technical Report includes a detailed analysis on potential impacts and indicates that while limited induced development may occur, where development is not prohibited, water quality protection regulations and the Endangered Species Act would apply to any public or private development project proposed by others.
City of Austin	More than 19% of the study area is undeveloped and developable land as stated in section 3. This is inconsistent with the statement that "there is limited development potential nearby"	The document states: "The degree to which that development is specifically attributable to construction of the proposed project is limited for several reasons: there is a high growth rate in the area in general, there is limited development potential nearby due to undevelopable lands, the area is also surrounded by developments that are already underway, and the roadway may serve regional traffic to a greater degree than it serves local traffic or spurs local development." The statement indicates that the proposed roadway is only partially connected to the potential for development in the area of influence; numerous other factors influence an individual developer's choice to pursue land development. Based on the analysis of a reasonable area where induced development could potentially occur, only about 25 percent of that area is potentially developable based on the analysis in the Indirect Impacts Technical Report.
City of Austin	Table 4-1: Questions 3 and 7 are answered "yes", yet they are posed as "and/or", not yes or no.	The "and/or" phrasing allows one or both conditions to be true. The answer is "yes" in both cases to the "and" scenario.

Organization	Verbatim Comment	Response
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Planning experts from the jurisdictions within the AOI do not expect significant development to occur as a result of the proposed SH 45SW project. Experts contacted in Buda and Hays County asserted that the developments currently planned for the area would be constructed regardless of whether the proposed project were built or not. While experts with the City of Austin and Travis County acknowledged that they expect the roadway to affect the amount and rate of development in the AOI, both also pointed to the minimal effect the proposed project would have on development in the region, given the area's high rate of growth overall. Therefore, impacts to neighborhoods resulting from induced growth associated with the Build Alternative are not anticipated to be substantial.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulation 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
City of Austin	On the water quality monitoring, it would be helpful to provide references to the various reports pertinent to the project including those specifically on SH45SW and Barton Springs water quality.	The comment references the technical report contained in Appendix H of the Draft EIS. References were provided at the end of the appendix.
City of Austin	All of the available water quality data and trends published do not seem to be used in the report as stated.	Additional resources may be available. The information presented is drawn from extensive research into the issue.
City of Austin	Repeating request for clarity of "minimal negative impacts".	"Minimal negative impacts" would be negligible or readily discountable impacts to a given resource, which would not affect the overall health of the resource.
City of Austin	The international BMP database is referenced here, yet calculation methods proposed in it are not used for BMPs in series, monitoring methods proposed by it are not used, and pollutants besides TSS that are addressed in it are not considered. The Texas Commission on Environmental Quality methods are used as the fallback again, which are inadequate for this application.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids. However, information is presented in Appendix H and in the Draft EIS that explains what constituents in highway runoff would be expected to be removed by permanent water quality controls.
City of Austin	A fundamentally flawed assumption is that all of these regulations will result in adequate protection of the sensitive resources involved. Most are state or nationwide and are the lowest common denominator for environmental protection. Some are better than others, but minimum regulatory controls are not enough for the impacts from SH45SW.	Comment noted. Additional discussion of analyses pertaining to water quality and regulatory influence is provided in the Final EIS. In addition, the robust analysis used to arrive at the conclusion to minimize adverse impacts through redesign plus the Environmental Compliance Management Plan proposed to ensure compliance during construction are avoidance and minimization measures that are mitigative from the ICI perspective. The existing regulations and guidance discussed in Section 8.0 of the Indirect Impacts Technical Report and Section 9.0 of the Cumulative Impacts Technical Report disclose existing regulatory measures that would apply to developments proposed by others within the Area of Influence or the Resource Study Areas respectively.

Organization	Verbatim Comment	Response
City of Austin	Regulatory measures are presented without much commitment to go beyond the lowest common denominator with the exception of the Edwards Aquifer rule TSS removal requirements. First, the stated use of only TSS as a parameter for BMP design does not result in adequate protection. Second, meeting the minimum threshold for both analysis and protection is not consistent with the stated TxDOT goal of making this roadway the most environmentally suitable sensitive built in the state as discussed at numerous meetings on the project.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids. However, information is presented in Appendix H and in the Draft EIS that explains what constituents in highway runoff would be expected to be removed by permanent water quality controls.
City of Austin	Several places such as the discussion of 404 requirements are merely to document why the regulation doesn't apply and a lesser regulatory standard is made. The point being here that even though a NWP applies and a PCN is not required, the standard of protection for the most stringent permitting classification (individual 404) and associated standards could be used to bolster the commitment to non- degradation rather than the minimum required by regulations. The individual permit and associated regulations and guidance is an example.	The project would comply with applicable regulatory standards and would exceed those standards in many instances. As shown in Section 3.7 of the Final EIS and in Appendix J - Waters of the U.S. Evaluation Technical Report, the project would avoid impacts to jurisdictional wetlands and waters of the U.S.
City of Austin	The mention of the City's Land Development Code and SOS ordinance, and ECM is made, but no commitment is made here on whether the project will meet these standards for BMPs, impervious cover, and Critical Environmental Feature Protection. Critical to this commitment is a non-degradation standard (rather than goal) for this sensitive area.	Roadway alignment has been shifted to minimize impacts to Flint Ridge Cave. Additional protective measures would be developed in later phases of the project and included in the Water Pollution Abatement Plan, Stormwater Pollution Prevention Plan, and Environmental Compliance Management Plan.
City of Austin	Groundwater section doesn't mention BSEA as sole source aquifer and what protections this affords it that can be used. Re: lawsuit document that says because no federal funds were involved (1992), SSA regulations and review don't' apply. As with other regulations, this could be used as an above and beyond for TxDOT to consider if there is additional to benefit water quality/quantity protection. It fits the definition of SSA regardless of federal funds involved.	Comment noted. Extensive best management practices are proposed that would minimize adverse impacts to water quality.
City of Austin	Source water protection measures in the Safe Drinking Water act for sole source aquifers are not just for wellhead protection and other activities on a regional or supplier basis. These measures can be used to some degree at a project level such as the SH45SW project. The examples of such projects could be used as models of what would be necessary to prevent contamination of the BSEA. MOU between EPA and state highway administrations on sole source aquifer protection are common. This potential should be investigated further to meet superior environmental goals for the project.	As designed, the proposed project would not impact any wells nor would it impact the Edwards Aquifer. Because of the stormwater protection measures incorporated into this project, a superior goal of meeting drinking water standards is not warranted.

Organization	Verbatim Comment	Response
City of Austin	Texas Water Code 26.401(b) states what nondegradation is not without stating what it is. Clean water act definition of degradation of surface waters is a negative change in water quality parameters that are significant from that present at the time the CWA was promulgated in 1974 as compared to today. It is an ambient water quality data driven determination. Texas Commission on Environmental Quality definition of degradation is vague and useless in evaluating projects such as SH45SW. Therefore TxDOT should either propose a measurable definition of degradation and nondegradation or adopt that in the COA SOS ordinance.	Comment noted. TxDOT adheres to the state of Texas definition of non-degradation.
City of Austin	"Any project located within the Barton Springs segment of the Edwards Aquifer would be required to follow all applicable regulations" This does not provide assurances that the regulations are adequate or that TxDOT is willing to go beyond the inadequate regulations currently in place at the state level or in other jurisdictions.	Comment noted. TxDOT adheres to the state of Texas Edwards Aquifer Rules, not local ordinances.
City of Austin	It is disingenuous to include local ordinances that protect water quality when the state does not follow them. If the state would choose to follow the City of Austin's' SOS Ordinance it would greatly reduce operational water quality impacts. An acknowledgment of the regulation does not constitute a commitment to comply with it.	References to the City of Austin's SOS Ordinance are used as an example of a regulation that is in place to protect water quality for projects within the City of Austin's jurisdiction within the area of influence of the project and the Resource Study Area for surface and ground water. This discussion is not intended as a commitment by either TxDOT or the Mobility Authority to comply with the SOS Ordinance. Please refer to Section 4.0 for a discussion of the indirect impacts, Sections 7.3 and 8.2 in Appendix D, and Section 9.2 in Appendix I for discussions concerning federal, state, and local regulations in place to protect water quality.

Organization	Verbatim Comment	Response
City of Austin	Since the regulations of the Barton Springs Edwards Aquifer Conservation District don't apply to state highway projects this paragraph should be replace by one that discusses the application of the Consent Decree between the BSEACD and TxDOT to this proposed project.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. Mention of the Consent Decree is not applicable in this section (Appendix H Section 3.1.2).
City of Austin	The selection method for BMPs by decision tree does not replace an examination of what will work, what has worked, documented examples of what worked, or support of any kind for construction and operation of a highway in a sensitive karst aquifer watershed with implications for recreation, water supply, endangered species. Due diligence demands such in-depth analysis and effort beyond the status quo.	As is presented in the Draft EIS and Appendices, the suite of best management practices included in the proposed project meet or exceed the current regulatory requirements for water quality protection. Decisions on specific measures will be made during final design.
City of Austin	Rather than adopting a method for BMP selection from South Carolina, wouldn't it be simpler to just adopt the local City of Austin Environmental Criteria Manual.	The team has committed to compiling information on best management practices and water quality protection from a variety of sources, many of which are presented in the Draft EIS and Appendix H.
City of Austin	Equations identify that efficiency is "(not in percent)" but not the units required	The phrase "not in percent" is used to indicate that the values represented are in "decimal percent" form, such that a value of 0.50 would indicate 50 percent as opposed to 0.50 percent.
City of Austin	The list of non-structural BMPs are presented without any indication of commitments to use any of them on this project.	Many best management practices were considered, this presentation is meant to represent that thorough search and evaluation. The best management practices carried forward for further consideration are presented elsewhere and final applications would be included in the Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan, which would be part of the Plan Specifications & Estimate phase.
City of Austin	Why mention proprietary methods if they were "generally not successful", or else identify how they have been successful when incorporated into a project with other BMPs.	Many best management practices were considered, this presentation is meant to represent that thorough search and evaluation. The best management practices carried forward for further consideration are presented elsewhere and final applications would be included in the Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan, which would be part of the Plan Specifications & Estimate phase.

Organization	Verbatim Comment	Response
City of Austin	Please define the Engineering Work Group with approval authority over modifications to DEIS commitments. It appears that no independent review will be made for these modifications.	The engineering subcommittee of the Technical Work Group will continue working on the project through the design phase. This committee consists of Barton Springs/Edwards Aquifer Conservation District, City of Austin, Hays & Travis co, TxDOT, Central Texas Regional Mobility Authority and others. The engineering subcommittee will look at detailed plans.
City of Austin	"This begins with a commitment to carry out all appropriate and permitted resource investigations and to adhere to subsequent commitments and recommendations" is mentioned here in relation to construction phase controls; however, the "resource investigation" of subsurface catchments of Flint Ridge Cave and the other significant features identified in the ongoing geological assessment have not been carried out. The DEIS should go no further without completion and use of these investigations.	Information from the recently completed Geologic Assessment and Karst Survey has been and would continue to be implemented in project development. Other available, applicable scientific studies would be incorporated as appropriate.
City of Austin	Statements of measures to avoid impacts to groundwater quality and aquatic salamander habitat during drilling would appear to be reasonable methods applied anywhere and not driven by the sensitivity of the project. Methods of protection above and beyond the lowest common denominator should be listed in the DEIS, as these normal methods are assumed.	Impact minimization and avoidance measures were developed by compiling information and techniques from a variety of sources and are consistent with the goals of groundwater quality and salamander habitat protection.
City of Austin	Site preparation "done in a way to minimize the amount of natural vegetation disturbed at any given time" should be included beyond staging and fencing. This would be part of a superior environmentally protective project. It should be posed as a chance for innovation to the E&S design group and documented here.	Comment noted.
City of Austin	Mitigating effects of structural BMPs would appear to indicate a direct linkage between controls and aquatic life. Only control of TSS load was presented. No way to determine if this is enough to protect aquatic life and cannot be counted on to work alone. Avoidance should be considered first.	The current regulatory framework is designed to protect water quality. The discussion is presented in terms consistent with the regulatory framework and an expanded discussion of the effects of best management practices on other constituents of concern is provided in Sections 3.6 and 3.7 of the Final EIS and in Appendix H.
City of Austin	Please provide a definition for "minimal negative impacts".	"Minimal negative impacts" would be negligible or readily discountable impacts to a given resource, which would not affect the overall health of the resource.
City of Austin	Much of the section on SWP3 compliance could be referenced to the COA Environmental Criteria Manual rather itemized here	Several sources were referenced to compile compliance guidance. The project-specific outline is a representation of those sources.
City of Austin	Although mentioned in other sections, the intent to comply with all parts of the Optional Enhanced Measures should be listed under WPAP completion.	The proposed project would fully comply with current regulatory requirements.
City of Austin	Natural buffers that are not to be disturbed should be protected by fences installed prior to initiation of any ground disturbance.	Such measures would be developed as part of the Plan Specifications & Estimate documents (e.g. Water Pollution Abatement Plan) and would meet or exceed current, applicable regulations.

Organization	Verbatim Comment	Response
City of Austin	Referenced Text: "An Environmental Compliance Management Plan (ECMP) would be developed with water quality specific guidelines and trained personnel to ensure its success." - Please provide an outline of the proposed plan. Environmental Impact cannot be determined from the intention to develop a plan.	An outline is provided in Appendix H. The Environmental Compliance Management Plan would be further developed during the Plan Specifications & Estimate phase.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. If dikes are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.	It is unclear what the comment is referring to when it mentions "U.S. Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. If swales are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.	It is unclear what the comment is referring to when it mentions "U.S. Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	"If dikes are found to induce off-site erosion…" and "If swales are found to induce off-site erosion…." Does this happen much with TxDOT designs of these features. If so, it gives little confidence that dikes and swales proposed for this project will be adequately designed and implemented commensurate with the sensitivity of the project area.	These statements do not imply any level of frequency for such events, but rather to illustrate the suite of tools available to TxDOT to respond to such hypothetical situations.
City of Austin	Construction of permanent controls "as early as practicable" is not a comforting commitment. Analogies to WTP4 by the COA would encourage TxDOT to make the commitment that permanent controls WILL be in place during construction phase or some other statement stronger than "early as practicable".	The language used here is appropriate for this stage of project assessment. As definitive commitments are developed during the Plan Specifications & Estimate phase, language would evolve as appropriate.
City of Austin	Spill and Haz. Materials Management sections fails to specifically reference (Use and Management of Containers,40 CFR 264.175 - 274.176) Small/Portable Secondary Containment. Although this may be covered in the Hazardous Materials Spill Protocols there is no way to verify with a broad reference.	The cited regulations pertain to hazardous waste storage areas which are not applicable to the project.
City of Austin	For erosion controls, COA has had some success with coir logs. These might be useful around karst buffers.	Comment noted. Consideration will be given to the suggestion.

Organization	Verbatim Comment	Response
City of Austin	Some separation of what is required versus what is proposed as a superior protection for the sensitivity of the project area should be attempted. The Spill and Hazardous Materials Management and Good Housekeeping "would be used" indicates the business as usual protocols and methods and not what would be above and beyond.	These protocols will be developed later during the project implementation phase.
City of Austin	As in many projects in the BSEA, the geological features of significance are open to interpretation. Typically, geologists from the City identify a number of features conservatively and others that require additional investigation. The applicants geologists then evaluate features that are under dispute and some settlement is reached that is often less than adequately protective of recharge water quality and quantity than what is proposed by the City to begin with. Although the collaboration on surveys in this project is encouraging, superiority of the project would warrant an assumption of significance for recharge features where doubt remains, or further investigation is not scheduled.	Each karst feature within the right-of-way was evaluated for significance and avoidance and mitigation measures were taken where appropriate.
City of Austin	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft contour intervals (versus 2 ft used by the TxDOT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the EIS.	The drainage area has been revised for the Final EIS using a more exact method of delineation. A digital terrain model was created using an aerial survey commissioned by TxDOT for a 1400-ft buffer around the proposed project and 2-ft LiDAR contours for any terrain outside the 1400 ft. Due to the use of breaklines and spot elevations included in the aerial, it is far more accurate to find the natural high ridges with the aerial as opposed to LiDAR contours, which must interpolate between two adjacent contours, creating a wide shelf along the ridge lines. These shelves make it difficult and subjective to delineate the watershed boundary. Then, the "Trace Upstream Path" tool in Geopak Civil software was used to automatically delineate the ridge or watershed. The 1-ft contours had so many small depressions that it was impossible for the software to locate a discernible ridge line. Again, the process of using LiDAR contours creates the "shelf" effect at the ridge locations which can create issues with accuracy. Therefore, the 1 foot contours were used for verification purposes only. Therefore, within the 1400-ft corridor, which is where the roadway is being constructed, the aerial survey is far better and more accurate than any dtm file created by contours alone. This revised drainage area was calculated to cover 55.5 acres. This estimate is well within acceptable tolerances for drainage-related computations and any discrepancy based on areas outside the project right-of-way would not impact this project. Through site investigations in the field around Flint Ridge Cave, we have confirmation of the accuracy of our delineation on the west side of Flint Ridge Cave, which is the most critical part of the watershed.
City of Austin	This portion of the DEIS does not address the fact that a portion of the roadway ROW overlies the Flint Ridge Cave system and what potential impacts that might have.	Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices.

Organization	Verbatim Comment	Response
City of Austin	Says 5.6 acres of Flint Ridge surface catchment will be covered by impervious surfaces but does not note how many acres of the catchment will be disturbed or diverted by the east side berm.	The proposed alignment has changed in response to public comment and new scientific findings. The proposed effects are detailed in the Final EIS in Section 3.6 of the Final EIS.
City of Austin	The DEIS states that BMPs would maintain the flow to naturally occurring sensitive features to the extent practicable but then only mentions that the amount of (surface) water draining to Flint Ridge would be maintained. Since the DEIS does not contain the most recent karst data impacts on surface drainage to other karst features cannot be determined. However, COA calculations of the drainage areas cutoff to other karst features indicate a significant reduction in area draining to features such as Hat Sink, Jubilee Sink, F29 and F136.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports were incorporated into the Final Environmental Impact Statement and summarized (in part) in the following Final EIS addendum reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. Based on these findings, 17 sensitive karst features are located within the state-owned ROW. The alignment has been adjusted to minimize impacts to sensitive features, as discussed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	To prevent the possible infiltration of untreated roadway stormwater runoff through the soil matrix into Flint Ridge Cave, a bentonite (clay) liner would be installed up gradient from and adjacent to the berm. This would entail excavating approximately six inches of soil below the topsoil level, placing and compacting the bentonite liner, and covering with adequate topsoil to support revegetation. Since we do not know where the subsurface catchment area is, it's hard to say if this would work, and if so, then it would alter the hydrological regime further drying out the cave, thus negatively impacting the cave fauna.	The berm has been removed for the roadway design. The roadway alignment has been adjusted based on the findings of karst survey. See Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW. Given the uncertainties of the subsurface catchment and the efficiencies of recharge thereto, the project team has focused on preservation of the integrity of the surface catchment of FRC through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices.
City of Austin	A good example of a berm with bentonite liner should be provided to ascertain if this method will be successful or not. Since so much depends on its operation to divert stormwater, an untried design with doubt as to long term viability should be approached with all due caution.	Berm has been removed for the roadway design.
City of Austin	Use of bentonite to reduce infiltration of runoff through soils is creative and indirectly acknowledges that runoff does infiltrate through soils. However, the DEIS does not address how the bentonite will stay hydrated to prevent cracking which would allow runoff to pass through the bentonite layer and into the vadoze zone or how this BMP will be inspected.	Berm has been removed for the roadway design.

Organization	Verbatim Comment	Response
City of Austin	The Geological Assessment of the WPAP requirements is stated to identify other features within the SH45SW "footprint". This limited area, even smaller than the ROW would seem to be and inadequate boundary for the assessment. At least the ROW and hopefully extending to surface and subsurface drainage extents boundaries should be used for the assessment regardless of the Texas Commission on Environmental Quality lowest common denominator.	The geologic assessment completed for the Water Pollution Abatement Plan will identify all sensitive features within the state-owned right-of-way and their drainage basins. It will also identify Flint Ridge Cave and its drainage basin. Additional features outside the right-of-way will be identified for reference.
City of Austin	This appears to be the only specific mention of the drip tests ongoing by the COA. This is the method of hydrogeological investigation endorsed by USFWS for use in showing adequate protection for BCP caves such as Flint Ridge and at minimum merits a discussion in the DEIS of how that data will be incorporated during design of the project.	Comment noted.
City of Austin	"The cave is currently gated, and bi-annual cave faunal surveys and cricket counts are being conducted." WPD staff have recently bumped up surveys to quarterly, plus additional surveys 2 weeks after any dye injections. The DEIS does not address potential impacts to Flintridge cave and other nearby caves from introduced invasive species such as tawny crazy ants nor does it address site disturbance/ reduction in canopy cover thus improving conditions and densities or red imported fire ants.	Efforts would be made to adhere to the Executive Order on Invasive Species and relevant state regulations when dealing with invasive species.
City of Austin	It is somewhat alarming that the use of a vault over the Flint Ridge cave opening is being considered without an in-depth hydrological and hydraulic evaluation as part of the DEIS. However, leaving such decisions for the design phase are just as disturbing because no public review will be possible at that point.	The Final EIS has been updated to clarify that no vault is being considered.
City of Austin	COA has recently estimated the surface catchment to several karst features within the SH45 ROW and will provide them to TxDOT/CTRMA for use in the DEIS.	Surface drainage areas were delineated for the 17 sensitive karst features identified within the state-owned right of way, including Flint Ridge Cave. Maps of these drainage areas are shown in Attachment 3 in Appendix H - Water Quality and Aquatic Resource Protection Technical Report.
City of Austin	3rd bullet, states If features or their catchments cannot be avoided, the area may be bridged. If a bridge option is implemented, cave entrances must be protected as outlined below Why not construct a bridge over Flintridge cave, thus reducing impacts on	The project team has focused on preservation of the integrity of the surface catchment of Flint Ridge Cave and other sensitive features through measures including roadway realignment, the minimization of vegetation impacts, and the development of water quality protection best management practices. See Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas.

Organization	Verbatim Comment	Response
City of Austin	Closure or mitigation of recharge features due to not practicable changes in alignment are referenced for the planning phase of the project. Given the final design contract is being decided during the review of the DEIS, it would seem that the planning phase is right now. However, the geological surveys are not complete and proposals for closure or mitigation of each feature have not been made.	The Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas identified 17 sensitive karst features within the state-owned right-of-way. The alignment has been adjusted to minimize impacts to sensitive features, as discussed in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.
City of Austin	TxDOT and CTRMA should be proactive and commit to protect all the natural buffers to all karst features that will remain within the ROW.	The Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas identified 17 sensitive karst features within the state-owned right-of-way. The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of these sensitive karst features. The surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features. Attachment 3 in Appendix H - Water Quality and Aquatic Resource Protection Technical Report shows the surface drainage area of each of these sensitive karst features. A 105 meter radius around Flint Ridge Cave has been provided for cave cricket foraging.
City of Austin	Karst features and undisturbed natural buffers should be fenced prior to any ground disturbance and the fencing can be used to help support the erosion/sedimentation controls for the feature.	Such measures would be developed as part of the Plans, Specifications, & Estimates documents (e.g. Water Pollution Abatement Plan) and would meet or exceed current, applicable regulations.
City of Austin	The DEIS should commit to restoring natural runoff to all karst features in the project area that are cutoff or reduced as a result of the project similar to that proposed for Flint Ridge.	Flow to naturally occurring sensitive features would be maintained to the maximum extent practicable. Conveyance of an equivalent amount of flow would be achieved to this standard. See Attachment 3 in Appendix H - Water Quality and Aquatic Resource Protection Technical Report for more detailed information on sensitive feature protective measures.
City of Austin	The protocol should add an item to have a U.S. Fish and Wildlife Service karst surveyor (biologist) inspect a void for potential karst invertebrate species or habitat. This protocol is described on page 3.8 of Appendix B of Texas Commission on Environmental Quality Guidance Manual (RG-348) entitled "Complying with the Edwards Aquifer Rules: Technical Guidance Manual on Best Management Practices" - "Optional Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates ."	Appendix B is not applicable because it applies to certain karst invertebrates that are not present on the project.
City of Austin	Please change the reference of (30 TAC 213 A (14)) to (30 TAC §213 (14))	Change made as suggested.
City of Austin	All voids encountered should be reported to Texas Commission on Environmental Quality. Please add "and reported to Texas	Change made. The complete development of Environmental Compliance Management Plan, including protocols for discovery of sensitive karst features with biological activity, would be part of the project's Plans, Specifications, & Estimates phase.

Organization	Verbatim Comment	Response
	Commission on Environmental Quality." after "inspected by a qualified geologist" in the first paragraph.	
City of Austin	At the end of the first paragraph, add a statement that the protocols of 2.2 of RG-348A, "Optional Measures for the Protection of Water Quality in the Edwards Aquifer (Revised)" (Sept. 2007) will be followed. RG-348A is Appendix A of RG-348.	The Draft EIS refers to including some aspects of the Optional Enhanced Measures. Natural buffers are based on the drainage area to each sensitive feature.
City of Austin	Bullet one should add "(less than 1 cubic foot)" after "small" and "located above a utility pipe embedment" after biological activity.	Suggestion will be considered for inclusion in the Plan Specifications & Estimate documents. "Less than 1 cubic foot" was added to Appendix H in the Final EIS.
City of Austin	Bullet two should be revised by replacing the word "covered" with "sealed" and to add the phrase "along the trench floor or wall" after (18 inch minimum thickness).	Suggestion will be considered for inclusion in the Plan Specifications & Estimate documents
City of Austin	Suggest adding a third bullet that reads: "Encase utility pipes for the distance of the void plus 5 feet on either end and ensure that a minimum of 6 inches of concrete surrounds the pipe."	Suggestion will be considered for inclusion in the Plan Specifications & Estimate documents
City of Austin	Suggest adding a fourth bullet that reads: "Voids that intersect the plane of the trench floor that exceed 4 feet in any direction require a specific engineered solution to address environmental and structural integrity."	Suggestion will be considered for inclusion in the Plan Specifications & Estimate documents
City of Austin	It does not address what to do if a void is encountered with "biological activity".	The complete development of Environmental Compliance Management Plan, including protocols for discovery of sensitive karst features with biological activity, would be part of the project's Plans, Specifications, & Estimates phase.
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. In cases of voids with water flow, flow would be maintained to the greatest extent practicable,, the walls would be stabilized if necessary with planks or sandbags, concrete would be poured over the pipe, sealing the void.	It is unclear what the comment is referring to when it mentions “U.S. Environmental Protection Agency guidance and case law.” The term “greatest extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Change first bullet to eliminate all of the sentence after the comma and replace with the following text "with pipes or trench modifications to isolate and preserve flow paths." This would be in line with the requirements of 30 TAC §213.5(b)(4)(B)(iv) to provide pollution prevention and flow preservation.	The preservation of flow paths in discovered voids is addressed in Appendix H, Section 4.2.4.
City of Austin	Add a second bullet that states "Mitigation will not occur until Texas Commission on Environmental Quality has provided written authorization for the proposed method for a specific void."	Coordination with Texas Commission on Environmental Quality for proposed void mitigation measures is addressed in Appendix H, Section 4.2.3.

Organization	Verbatim Comment	Response
City of Austin	"Permeable/Porous Friction Course (PFC) Pavement. PFC would be applied to the majority of SH 45SW road surfaces (exceptions being the bridge structures and the SUP). PFC has been shown to reduce up to 96 percent of TSS loads and 90 percent of heavy metal loads in stormwater runoff." The current Texas Commission on Environmental Quality guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with Texas Commission on Environmental Quality regulations and guidance.	Infiltration via pervious concrete is not proposed as the road would be impervious. Rather a porous overlay is proposed that would filter stormwater. The subgrade of the pavement would be impervious.
City of Austin	Testing of permanent BMPs is mentioned over the life of the project and the goal of using this for restoring intended function if not working as designed. This is an admirable commitment and one that should be outlined in more detail in the DEIS. Where else would it be outlined if not in the DEIS since final design is the next stage. Structures for flow and water quality monitoring of both ambient surface and groundwater quality as well as BMPs need to be planned and included in the design, not as an afterthought.	Monitoring and maintenance plans would be developed as part of the project's Plans, Specifications, & Estimates phase and included in the resulting documents (e.g. Storm Water Pollution Prevention Plan, Water Pollution Abatement Plan, Environmental Permits, Issues, and Commitments, and Environmental Compliance Management Plan)
City of Austin	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable.	It is unclear what the comment is referring to when it mentions “US Environmental Protection Agency guidance and case law.” The term “greatest extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.

Organization	Verbatim Comment	Response
City of Austin	Referenced text: "Current annual TSS loading over the Recharge Zone within the proposed project area is approximately 9,702 pounds TSS/year (see Table 5.1-3). Impervious surfaces associated with the proposed project would be expected to generate an annual TSS load of approximately 86,834 pounds/year. Currently proposed BMP configurations would exceed an 80 percent removal rate over the entire project. The Edwards Aquifer Rules (30 TAC 213) require the treatment of stormwater runoff from projects over the Edwards Aquifer Recharge Zone such that 80 percent of the incremental increase in TSS load generated is removed before the water is released. The portions of the proposed project over the Recharge Zone would be expected to generate a TSS load of 75,942 pounds/year. Design goals include configuring permanent, post-construction BMPs to achieve a TSS load reduction of at least 90 percent over the Edwards Aquifer Recharge Zone. Proposed BMP configurations over the Recharge Zone would exceed this goal and remove approximately 92.1 percent of the TSS load, thus leaving an annual load of 6,030 pounds of TSS. Although stormwater treatment is not required by over the Transition Zone (30 TAC 213), current design proposals would include stormwater treatment in these areas as well. Treatment of stormwater runoff would thus allow for a net decrease in annual TSS loading (an improvement over the No Build). Based on the net load calculated for the proposed project and rainfall data for the area (56.1 acres of impervious surface over the Recharge Zone and a 32 inch/year average rainfall), [(6,030 lbs. TSS/yr.) / (173.6 acre-feet of rainfall / year)], average TSS concentrations of stormwater runoff from the proposed project would average approximately 12.8 milligrams/liter (mg/L). " - This analysis relies upon Texas Commission on Environmental Quality Edwards Aquifer Technical Guidance (EA TG) for sizing BMPs to compare pre- development and post-development loads. This analysis does not explicitly account for the actual size of the ponds, the contributing drainage area or the drawdown time as it relates to runoff capture efficiency. The Texas Commission on Environmental Quality methodology does not explicitly account for loads that bypass the BMPS. The methodology uses several implicit assumptions to make the calculations simple, but less accurate. Additionally, Removal Efficiency is not a recommended procedure for measuring pollutant removal ("Use of Percent Removal to Evaluate BMP Performance." International BMP Database FAQ,	The methodology and values used in load reduction calculations are consistent with current applicable regulations and, as such, are appropriate and valid.

Organization	Verbatim Comment	Response
	2007). The City of Austin has updated the Environmental Criteria Manual to reflect the state of the science in calculating pollutant removal in BMP performance (ECM 1.6.9). It is recommended that this project adopt current methods to evaluate stormwater load impacts to characterize environmental impacts. Additional examples of Texas Commission on Environmental Quality deficiencies in allowable calculations include the treatment train equation. The EA TG Manual does not have a reference for this treatment train efficiency calculation. It appears that the Texas Commission on Environmental Quality referenced the City of Austin's old Environmental Criteria Manual as a source for treatment train efficiency. Please provide reference that demonstrates the validity of the treatment train efficiency. The City of Austin no longer recognizes it as a valid method for calculating controls in series. Finally, the use of Texas Commission on Environmental Quality rules is deficient in that is only considers TSS as a pollutant of concern. The proposed ponds have 80-90% removal efficiency for TSS, however, City of Austin Environmental Criteria Manual section 1.6.5 demonstrates significantly lower removal for pollutants of concern like Total Phosphorus (61%) and Total Nitrogen (31%). In conclusion, statements claiming that TSS loading after construction will be less than undeveloped conditions is optimistic and should be checked with a more robust method.	
City of Austin	Greatest Extent Practicable is a term under much debate and a discuss of it's meaning in light of EPA guidance and case law is necessary at some point. The example does not cover all the measures that would define GEP. The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge.	It is unclear what the comment is referring to when it mentions "U.S. Environmental Protection Agency guidance and case law." The term "greatest extent practicable" is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	HMTs consistent with the OEM are listed as a commitment here; however the statement that "The risk of harm to the Barton Springs salamander from hazardous material spills associated with the proposed SH 45SW would be reduced to insignificant levels by the capture and detainment capabilities of the proposed HMTs" would seem to be an overstatement. Spill risk assessment modeling would be necessary to substantiate this statement.	TxDOT conducted a hazardous materials spill risk assessment for similar roadways in Travis County, calculating a maximum of 5.6 hazardous liquids spills per billion vehicle miles traveled on one of the similar roadways evaluated for compares over a ten year period (Section 3.11 of the Final EIS).

Organization	Verbatim Comment	Response
	Based on modeling done by the City of Austin and published in the Barton Springs Catastrophic Spill Plan, fuel spills in this area have the potential to quickly reach Barton Springs. A more detailed consideration of this potential should be assessed in the DEIS.	
City of Austin	Again, both practicable and no effect are not substantiated by any objective definition or analyses. There would be no direct effects to the Barton Springs or Austin blind salamanders resulting from construction and operation of the proposed project. The project would use BMPs that would allow for a TSS removal rate of at least 90 percent. During construction, the BMPs would include erosion controls and sediment controls. The completed project would include facilities to collect and treat runoff prior to discharging it offsite. These treatment structures would be installed as early as practicable in the construction phase to allow for the treatment of construction phase runoff. The project would comply with Texas Commission on Environmental Quality's Edwards Aquifer Rules and TPDES standards. In addition, the project is more than nine miles from Barton Springs. Given all of these facts, the TSS load on the aquifer and Barton Springs would be less than the No- Build alternative. This shows that the project would have no effect on the species or their habitat. These controls limit the potential for cumulative effects, as discussed in the Cumulative Impacts Technical Report.	Contrary to the comment, TxDOT's studies indicate there would be no impact to the Barton Springs and Austin blind salamanders. These analyses and further information is provided in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays, Counties Texas.
City of Austin	Evaluation on BMP alternatives on the basis of "general acceptance by Texas Commission on Environmental Quality and in central Texas as an approved BMP on the proposed project site" does not constitute a verifiable analysis of BMP adequacy. No documentation can be made as to "approvals" and no statements of applicability to the proposed project site can be traced to Texas Commission on Environmental Quality or central Texas.	Best management practice adequacy is represented by the removal efficiencies of the proposed best management practice suite, which was calculated in accordance with applicable regulatory guidance.
City of Austin	Referenced Text: Table A.2.1 "Efficiency of hay bale dikes and mulch socks is cited as 95% from COA 2012a" - This information was taken from a PowerPoint presentation that was on the City's website. It was authored by a private entity, not the city of Austin. The City of Austin refutes the claim that hay bale and mulch sock efficiency is 95%. Please provide peer reviewed journal article or other published data to support claims of efficiency. Please remove COA, 2012a as a reference.	Many sources for best management practice efficiency were considered, this presentation is meant to represent that thorough search and evaluation. The best management practices carried forward and the values used for final efficiency calculations would be included in the Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan

Organization	Verbatim Comment	Response
City of Austin	This section starts a laundry list of BMPs, descriptions, and schematics that are better left as references than appendix-fodder if possible. In most cases, reference to the COA Environmental Criteria Manual would be better used as a primary source of this information without need to repeat it here.	Many best management practices were considered, this presentation is meant to represent that thorough search and evaluation. The source data for this information is presented here while more selective use of best management practices is determined in the appropriate documents.
City of Austin	As with A.3, this section is a laundry list of BMPs, descriptions, and schematics that are better left as references than appendix-fodder if possible. In most cases, reference to the COA Environmental Criteria Manual would be better used as a primary source of this information without need to repeat it here.	Many best management practices were considered, this presentation is meant to represent that thorough search and evaluation. The source data for this information is presented here while more selective use of best management practices is determined in the appropriate documents.
City of Austin	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered Natural vegetative buffers should be maintained to the maximum extent practicable (COA, 2013; Texas Commission on Environmental Quality, 2007b)	It is unclear what the comment is referring to when it mentions “U.S. Environmental Protection Agency guidance and case law.” The term “maximum extent practicable” is not used in the Draft EIS as a term of art or legal definition. Rather, the term is used to express the intent that the project will be constructed in a way that protects/minimizes the use of natural resources as much as possible, while taking into consideration any existing constraints such as technology, environment, etc.
City of Austin	Referenced Text: "Efficacy of silt fence is highly dependent upon the material, load and proper installation and maintenance of the fencing. Data collected during filtering tests on silt fence material indicated silt fence fabric can retain between 71 and 85 percent TSS depending on the fabric size selected and the sediment size distribution (Holloway, 2010). Silt fences cause runoff to pond, allowing heavier solids to settle out. Silt fences are most effective when used as retention BMPs and not relied upon to filter runoff. Proper installation is crucial to effectiveness and inspection should occur frequently, especially after rain events. Silt fences would be carried forward for use in the proposed SH 45SW project, and would be used in situations with flow disruption and water ponding the primary focus of their use as opposed to reliance on their filtering capabilities. A schematic illustration of a silt fence taken from Texas Commission on Environmental Quality, (2005) is shown in Figure A.3-1 ." - Since it is acknowledged that silt fence performs as a retention BMP, not filtration, please remove reference from Table A.1-2 that provides filter efficiency from the Holloway, 2010 report. Please refer to "An evaluation of geotextiles for temporary sediment control", Barrett et al, 1998 and note that typical TSS concentration from silt fence controls is approximately 500 mg/l. This number should be used in all loading calculations that attempt to quantify to 90% reduction in loadings from construction phase.	Information cited in the Draft EIS and its appendices is appropriate as it was presented. Calculations would be carried out in accordance with current regulatory guidance. Ninety percent load targets pertain to the management of post-construction total suspended solids loading derived from the incremental increase in total suspended solids associated with the project.

Organization	Verbatim Comment	Response
City of Austin	A study of pollutants on rooftops adjacent to MoPac north of the Colorado River found significant atmospheric deposition of PAHs, arsenic, chromium, and copper over 300 ft. from the road surface (Mahler and Van Metre, 2003). Since 38 acres of the land for the ROW was purchase from blocks of land acquired for water quality protection and adjacent land still has that purpose, the DEIS should address impacts from airborne pollutants from the highway on these lands and how that will be mitigated.	Under TxDOT guidelines, air quality analyses are limited to analysis of Mobile Source Air Toxins and carbon monoxide only. Because the proposed project's projected traffic is lower than the volume required for a Mobile Source Air Toxins analysis or carbon monoxide analysis, these analyses are not included in the Final EIS. A qualitative air quality analysis as required by TxDOT guidelines is located in Section 3.4. A discussion of mitigation for air quality impacts during construction is included in Section 6.3. The state-owned right-of-way on which this project would be constructed was purchased for transportation purposes prior to the purchase of surrounding water quality protection lands.
City of Austin	Replace the statement - "In the Travis/Hays County area, air quality is managed regionally by the Capital Area Metropolitan Planning Organization in coordination with TxDOT and Texas Commission on Environmental Quality." to read as "In the Travis/Hays County area, air quality is managed regionally by the Capital Area Council of Governments in coordination with EPA and Texas Commission on Environmental Quality."	Changes have been made.
City of Austin	The extent of the population range of the Austin blind salamander, which is a subterranean cryptic species, is not fully known. The species identification of the Eurycea salamander located west of the project is in question, and may not be Eurycea sosorum.	Comment noted. Texas Parks and Wildlife Department describes the habitat requirements for this species as "mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs (Sunken Gardens (Old Mill) Spring, Eliza Spring, and Parthenia (Main) Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of small aquatic invertebrates."
City of Austin	There is no Bendik and Turner 2000 report. Bendik and Turner 2011 analyses did indicate potential density dependent growth of Barton Springs salamander populations, but it is not accurate to state that this is inconsistent with "populations that are close to extinction." By definition as an endangered species, the populations are on a trend towards extinction.	Citation changed to Bendik and Turner 2011, consistent with list of references. Phrase "and is inconsistent with populations that are close to extinction" was deleted.
City of Austin	The statement that there have been no significant increases or decreases in populations of Eurycea at Barton Springs is not accurate. Population changes occur in response to hydrologic conditions, as well as in response to habitat modification and restoration.	Phrase "and that there have been no significant increases or decreases in the population sizes since monitoring began" deleted.
City of Austin	The City of Austin did not modify survey protocols in 1998 to look for Austin blind salamanders.	Revised sentence: starting in 1998, surveys were also conducted for the Austin blind salamander.
City of Austin	Provide a source for the listed impervious cover calculations for 2012.	Calculations provided by Blanton & Associates. The 2012 imagery source is the US Department of Agriculture National Agriculture Imagery Program (NAIP).

Organization	Verbatim Comment	Response
City of Austin	Cite more recent City of Austin temporal trend analysis for Barton Springs water quality (Herrington and Hiers 2010), which did identify degrading temporal trends in Barton Springs including for nitrogen.	The established performance standard for permanent stormwater control measures in the Edwards Aquifer Rules is adequate to protect water quality at Barton Springs based on a recent evaluation of City of Austin monitoring data (Herrington and Hiers 2010) by Dr. Michael Barrett of the University of Texas Austin Center for Research in Water Resources. Dr. Barrett concluded that stormwater controls have been effective in preventing degradation of water quality at Barton Springs from stormwater. Appendix I has been updated to reflect these references. Citation: Effectiveness of Stormwater Regulations in the Barton Springs Zone: Presentation given by Dr. Michael Barrett to the Capital Area Erosion Control Network on 23 October 2014.
City of Austin	Conclusions on Barton Springs salamander life history referenced from Gillespie 2011 are not accurate. That is one possible life history, and information from Barton Springs salamanders does not directly support that conclusion. Barton Springs salamanders do not have high fecundity, and the statement relating to the possibility that the Barton Springs salamander can rebound from few remaining individuals ignores the genetic bottleneck created by that life history and is not supported by monitoring data.	The information referred to is prefaced by the statement, "…according to one study…" and represents a summary of the life history information provided in the Gillespie study. See Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas for additional information on Eurycea salamanders.
City of Austin	This section only addresses water quality impacts and does not include water quantity impacts to the endangered salamanders.	Potential water quantity impacts are addressed in Section 3.6 of the Final Environmental Impact Statement. See also the Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.
City of Austin	More than 750,000 people visit Barton Springs annually	Comment noted.
City of Austin	Please check references against the bibliography. Herrington and Hiers was published in 2010.	Final EIS was updated to reflect 2010 publication.
City of Austin	The City of Austin collects data from Bear Creek and Slaughter Creek through the Environmental Integrity Index (EII). EII data is available online as well at http://austintexas.gov/department/environmental-integrity-index and at https://data.austintexas.gov/Environmental/Water-Quality-Sampling-Data/5tye-7ray Please note that the Onion Creek data shown from LCRA's website was collected by the City of Austin and provided to LCRA and Texas Commission on Environmental Quality thru the Clean Rivers Program QAPP.	Data source noted.
City of Austin	Graphs show an apparent degrading trend over time for some constituents including dissolved oxygen. Perform a trend analysis and provide equations and r2 values with trend lines shown on graphs.	When applied to the values shown in Appendix I, Figure 5-7, trend analysis reveals an R-squared value for Site 12448 of 0.0013, and for Site 17275 R-squared equals 0.0458. Neither of these are declining (negative) and the slope of each is small which indicates little change over time (i.e. stable).

Organization	Verbatim Comment	Response
City of Austin	Provide a reference to support the statement that "conductance in surface water increases naturally as contact time with soil and stream bed increases…"	Mahler, et al. 2006 (existing in administrative record) or alternately: Clark, M.L., and Davidson, S.L., 2009, Specific conductance and dissolved-solids characteristics for the Green river and Muddy Creek, Wyoming, water years 1999-2008: U.S. Geological Survey Scientific Investigations Report 2009-5168, 18 p.
City of Austin	The most recent City of Austin watershed protection ordinance was passed in October 2013.	Comment noted.
City of Austin	Additional bond money for water quality protection lands were approved in 2012.	Comment noted. This information has been added to Appendix I.
City of Austin	The data shown was collected by the City of Austin. Provide statistical analysis to support the claim that these water quality parameters are stable. Dissolved oxygen appears to be decreasing over time from the graphs shown.	When applied to the values shown in Appendix I, Figure 5-7, trend analysis reveals an R-squared value for Site 12448 of 0.0013, and for Site 17275 R-squared equals 0.0458. Neither of these are declining (negative) and the slope of each is small which indicates little change over time (i.e. stable).
City of Austin	Flow graph should be on log scale to show prevalence of base flow conditions.	Flow graphs are included as they are presented by the US Geological Survey.
City of Austin	Provide citations and statistical analysis that supports the conclusions that water quality within the RSA is stable, and is influenced by increasing regulatory protection measures.	Barrett (2014) provides an analysis of water quality data collected by the City of Austin. Concentration of total suspended solids, the constituent of concern that is regulated by the Edwards Aquifer Rules, is shown by the data to have a negative trend (decreasing concentration) over the past approximately 20 years. Over the past 14 years, the population of Austin has increased by 28.3 percent and Kyle has increased by 481 percent. Water quality is not tracking growth, in fact it is trending in an opposite manner. Zinc and copper, two constituents associated with roadway runoff, are also discussed and negative trends are shown for those as well. Phosphorus was shown to have a statistically insignificant negative trend, and nitrates were significantly increasing. However, nitrate concentrations in roadway runoff were below those typical of aquifer measurements, and the argument is presented that roadway runoff would dilute (lessen) nitrogen concentrations in the aquifer. Therefore, given the concurrent growth in population and decrease in many water quality constituents it seems reasonable to ascertain that current regulatory influences have had a stabilizing effect on water quality. Water quality is stable: According to the Environmental Integrity Index, which is a cumulative assessment of multiple water quality parameters that is carried out by the City of Austin biannually on watersheds in the Austin area, none of the four watersheds in the Resource Study Area show clear trends between 2001 and 2012. These data are presented in Appendix I as Figure 5-9.
City of Austin	Because of the loss of quality and quantity of recharge to the aquifer, there are indirect impacts to federally listed endangered species as a result of the proposed project. Any impacts to endangered species constitute take and are significant.	No impacts to water quality or quantity are anticipated. Therefore, no impacts to federally listed endangered species are anticipated. See the following technical reports for more information: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas, and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.

Organization	Verbatim Comment	Response
City of Austin	The DEIS only analyzes load reductions for TSS, and thus conclusions that the BMPs will maintain water quality are not supported. Removal rates have only been calculated for TSS, and this should be explicitly stated.	The determination and discussion of removal efficiency were prepared and presented in accordance with current regulatory guidance
City of Austin	There are not "potential" reductions in recharge if karst features are directly impacted. These are direct impacts to recharge quantity.	The proposed alignment has been adjusted to avoid permanent filling or other direct impacts to the openings or surface expressions of these sensitive karst features. The surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project. Compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features.
City of Austin	No quantification of the loss of recharge was provided, and thus the statement that impervious cover as a result of the proposed project would "slightly" reduce recharge is not supported and invalid.	Given the uncertainties of diffuse upland recharge, and the complexities of streambed recharge rates confound precise calculations. In an abundance of caution, the project team has focused on promoting recharge of treated stormwater runoff and preserving natural recharge opportunities.
City of Austin	Were the projects identified in Table 7.3 included in the traffic impact analysis? Please identify which, if any, were included in traffic modeling.	Traffic modeling for the SH 45SW project utilized the Capital Area Metropolitan Planning Organization 2035 Travel Demand Model. Therefore, the traffic modeling included only regional transportation improvements that are part of the plan.
City of Austin	Any indirect impacts to endangered species are significant. The proposed project will reduce the quality and quantity of recharge to the Edwards Aquifer, and thus could constitute a taking of listed species and require a permit from the US Fish and Wildlife Service	The proposed water quality ponds would release stormwater wilt lower total suspended solids concentrations than background levels and the releases would occur after peak storm discharges. This would allow for increased recharge of well treated water. See also: Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. There would be no direct effects to the Barton Springs and Austin blind salamanders from the proposed project. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected as a result of the project. Reasonably foreseeable projects undertaken within the RSA would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs salamander or the Austin Blind salamander or their habitat.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.

Organization	Verbatim Comment	Response
City of Austin	Any indirect impacts to endangered species are significant. The proposed project will reduce the quality and quantity of recharge to the Edwards Aquifer, and thus could constitute a taking of listed species and require a permit from the US Fish and Wildlife Service	Best management practices (BMPs) would be used during construction and operation of the SH 45SW project to minimize and avoid impacts to water quality. These BMPs would allow for a TSS removal rate of at least 90 percent of the incremental increase in Total Suspended Solids (TSS) load over the Recharge Zone. The proposed water quality ponds would release stormwater with TSS concentrations that are lower than background levels, and the releases would occur after peak storm discharges. This would allow for increased recharge of well-treated water. Therefore, the project would not result in an impact to the salamander species that rely on the quantity and quality of groundwater in the aquifer.
City of Austin	Water quality degradation over time at Barton Springs demonstrates that Edwards Rules are not sufficient to preclude impacts to endangered species and maintain the quality of water in the Edwards Aquifer.	Barrett (2014) provides an analysis of water quality data collected by the City of Austin. Concentration of total suspended solids, the constituent of concern that is regulated by the Edwards Aquifer Rules, is shown by the data to have a negative trend (decreasing concentration) over the past approximately 20 years. Over the past 14 years, the population of Austin has increased by 28.3 percent and Kyle has increased by 481 percent. Water quality is not tracking growth, in fact it is trending in an opposite manner, thus indicating that existing regulations are achieving their intended goals.
City of Austin	The project will negatively impact the quantity and quality of water recharging the Edwards Aquifer by increasing impervious cover, increasing the probability of occurrence of hazardous material spills, directly impacting surface drainage areas of karst features and directly impacting subsurface drainage area of karst features. This has a direct impact on endangered salamanders at Barton Springs, and should be included in the analyses of direct impacts. Additionally, the DEIS does not address any subsurface drainage area impacts to affected karst features.	The effects these potential impacts (increasing impervious cover, hazardous materials spills, and direct impacts to surface drainage areas of karst features) could have on the endangered salamander species at Barton Springs would be classified as indirect impacts on these species, which are impacts that are caused by the project but occur farther removed in time and/or space than direct impacts. Indirect impacts to threatened and endangered species, including the Austin blind and Barton Springs salamanders, are discussed in the Indirect Impacts Technical Report (Appendix I of the Final EIS). This analysis concludes that given the proposed water quality Best Management Practices, the limited access nature of the roadway, the large amount of protected lands adjacent to the proposed project, and existing regulations to protect the quality and quantity of groundwater within the aquifer (to which all developers in the area must comply), no indirect impacts to these listed salamander species are expected as a result of the proposed project
City of Austin	The DEIS references reports in other sections (see Herrington and Hiers 2010) that document decling water quality in Barton Springs over time that is not included in this table.	Although the Herrington and Hiers 2010 study is not specifically referenced in Table 4-1, it is referenced in Section 5.2 of the Cumulative Impacts Technical Report in reference to trends of decreasing dissolved oxygen and increasing conductivity. It is also referenced as the basis of an evaluation of City of Austin monitoring data conducted by Dr. Barrett that concluded that stormwater controls have been effective in preventing degradation of water quality at Barton Springs from stormwater.
City of Austin	This section does not address the loss of recharge through affected karst features and addition of impervious cover over the recharge zone.	Therefore, given the concurrent growth in population and decrease in many water quality constituents it seems reasonable to ascertain that current regulatory influences have had a stabilizing effect on water quality.
City of Austin	Pollutant removal rates were only calculated for TSS, and not for other constituents with lower removal rates that would adversely impact the quality of water recharging the aquifer.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids. However, information is

Organization	Verbatim Comment	Response
		presented in Appendix H and in the Final EIS that explains what constituents in highway runoff would be expected to be removed by permanent water quality controls.
City of Austin	This section does not address the loss of recharge through affected karst features and addition of impervious cover over the recharge zone.	Water quality is stable: According to the Environmental Integrity Index, which is a cumulative assessment of multiple water quality parameters that is carried out by the city of Austin biannually on watersheds in the Austin area, none of the four watersheds in the RSA show clear trends between 2001 and 2012. These data are presented in Appendix I as Figure 5-9.
City of Austin	Will the project comply with the requirements of both of the cited Optional Enhanced Measures of the Edwards Rules?	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. Additional protective measures would be considered on a case-by-case basis. The Optional Enhanced Measures are guidance documents.
City of Austin	How does impervious cover added by the project within the TxDOT right-of-way (percent of impervious cover within the land owned by TxDOT) in the project area compare to the listed City of Austin regulatory limits?	The City of Austin regulatory limits for impervious cover do not apply to TxDOT projects.
City of Austin	The most recent City of Austin watershed protection ordinance was passed in October 2013.	Comment noted.
City of Austin	The DEIS analyzes only TSS removal, and does not quantify impacts for any other constituents even though the DEIS includes tables showing removal efficiencies for some constituents of concern to be lower than the reported TSS removal values.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids. However, information is presented in Appendix H and in the Draft EIS that explains what constituents in highway runoff would be expected to be removed by permanent water quality controls.
City of Austin	Water quality declines have been documented in the Edwards Aquifer. No references are provided in the DEIS stating the Edwards Aquifer water quality is not declining over time. Thus, the statement "The resource is considered by some to be threatened…" is not supported unless references stating that water quality is not declining are provided.	Trends of various pollutants, including some typically attributed to development, in surface and ground water are presented in Appendix D, Appendix H, Appendix I, and in the Final Environmental Impact Statement.
City of Austin	Removal rates for constituents other than TSS are not presented in the DEIS.	TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project will be in full compliance with the Edwards Aquifer Rules. There is no applicable regulatory requirement to demonstrate removal of constituents besides total suspended solids; therefore, no specific performance goals are described for pollutants other than total suspended solids.

Organization	Verbatim Comment	Response
City of Austin	Due to the lack of quantitative analyses presented in Appendix I as stated in previous comments, the Cumulative Impacts assessment is incomplete and the conclusions stating that impacts will be limited is wholly unsupported. Additionally, there was no consideration of the cumulative impacts of the other planned roadway projects currently underway by TxDOT over the recharge zone of the Edwards Aquifer.	Quantitative data on past, present, and anticipated development projects is shown in Figure 7-1 and included in several attachments to Appendix I, as well as in the discussions and tables in Section 7.0 of Appendix I. Oak Hill Parkway and MoPac projects have been listed more clearly in Table 7.3. In addition, the detailed analysis conducted for the Groundwater Resource Study Area was an intensive mapping exercise to track impervious cover change over time and directly confronts the connection between past development, impervious cover, and potential water resources concerns. Other roadway projects are disclosed and maps provided from numerous entities including Capital Area Metropolitan Planning Organization, Hays County, Travis County, and numerous cities within the Resource Study Area. Cumulative impacts have occurred in the Resource Study Areas but there is still only a limited connection between this project, its potential to partially induce development (at intersections), and other past and planned development projects within those areas.
City of Austin	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. Based on this analysis, given the limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction, and the incremental contribution the proposed roadway would make toward induced development in the AOI, in the context of the continuing trends of land use development and conservation initiatives underway within the RSAs, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts.	TxDOT rules define the term significant as it has been interpreted under National Environmental Policy Act and its related regulations. See 43 Texas Administrative Code 2.5 (26). That interpretation includes the definition used in 40 Code of Federal Regulations 1508.27, which focuses on context and intensity considerations. An agency must examine the context or setting in which the action occurs (e.g. national, regional, affected interests, and locality) and consider short- and long-term effects of the action. An agency must also analyze the intensity, or severity of the impact, considering: both beneficial and adverse impacts to public health and safety; unique geographical characteristics; controversy related to effects on human environment, uncertainty or unknown risks involved; precedent that may be set; relatedness of the action to other actions for a cumulative impact that may be significant (significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment, and significance cannot be avoided by terming an action temporary or by breaking it down into small component parts); impacts to or loss of scientific or cultural resources; endangered species impacts; and any other violation of any other environmental protection law.
Texas Parks and Wildlife Department (TPWD) - App H	Page H-33 states that where protection of the feature is not an option, for example where alternate alignments or configurations are not practicable and the alignment goes over a feature, such features should be evaluated for closure or mitigation. These determinations would be made during the planning phase of the proposed project. Recommendation: TPWD recommends TxDOT consult with TPWD during the planning phase of the project if closure or mitigation of a karst feature is necessary.	Closure or mitigation of a karst feature is unlikely during the planning phase of the proposed project; however, further consultation with applicable agencies, including the Texas Parks and Wildlife Department, would occur if necessary.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - App H	Page H-45 states "The treatment of stormwater runoff and the reduction of sediment loading through TSS removal would mitigate the threats to sensitive aquatic resources such as the Barton Springs salamander." Comment: TPWD does not concur with this statement and does not consider treatment of stormwater runoff and the reduction of sediment loading through TSS removal sufficient mitigation for threats to sensitive aquatic species. As previously mentioned, at a minimum, some runoff into caves and streams will occur during high flow events. Design plans and the implementation of water quality BMPs attempt to minimize this impact, but it is likely that there will be some impact.	Comment noted. TxDOT is implementing and abiding by Texas Commission on Environmental Quality's regulations for this project. If constructed, the project would be in full compliance with the Edwards Aquifer Rules regarding water quality. As designed, the proposed best management practices would exceed treatment requirements. In addition, the retention of stormwater runoff and gradual release from water quality ponds would maintain the quantity of water recharging to the aquifer. These best management practices, combined with additional protections in the forms of a Texas Commission on Environmental Quality-approved Water Pollution Abatement Plan and Storm Water Pollution Prevention Plan, would ensure that impacts to the Barton Springs and Austin blind salamanders would not occur. Further discussion is provided in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas and the report titled: Potential for Impacts to Endangered Eurycea Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas.
Texas Parks and Wildlife Department (TPWD) - App H	Page H-46 states that these ponds (water quality ponds) would capture roadway runoff, including hazardous material spills, from all portions of the roadway except in certain small areas in intersections where it is not practicable to establish grades that would allow draining runoff to Hazardous Material Traps (HMTs). Page H-47 states that the Barton Springs Salamander Recovery Plan (USFWS, 2005a) identifies hazardous materials spills on bridges as being of particular concern because of the high recharge potential associated with creeks. Current design would allow for total capture of runoff from bridge surfaces. This would allow for the detainment of hazardous material spills and prevention of contaminated water recharging to the aquifer. Recommendation: It is unclear to TPWD what would happen to roadway runoff at the above-mentioned intersections where HMTs cannot be constructed. The DEIS does not address how these intersections meet the requirements of the Barton Springs Salamander Recovery Plan if a hazardous material spill occurs near a bridge or other grades without stormwater capture. TPWD recommends addressing this concern in the FEIS.	Hazardous materials traps would contain spills at the Bear Creek bridge. Concerning spills in certain small areas where it is not practical to establish grades that would allow draining to Hazardous materials traps, hazardous material spills that do not directly affect a water body, i.e. spills to land, are cleaned to background (usually non-detect) levels. Contaminated soil is excavated and removed in the cleanup process. The Final Environmental Impact Statement has been updated to describe TxDOT standard spill response procedures (Section 6.8).
Texas Parks and Wildlife Department (TPWD) - Appendix H: Water Quality and Aquatic Resource Protection Technical Report (App H)	Page H-31 states that final void protection measures would be prescribed after the completion of the geological assessment and would be dependent upon the void descriptions (e.g., sinkhole, sensitive feature, cave). Protective measures including temporary and permanent BMPs would be evaluated based on the specific feature and the location of that feature with respect to construction activities. Recommendation: TPWD recommends TxDOT consult this office	The Final Geologic Assessment is included in the Final EIS as Appendix O. A specific geologic assessment conducted following any discovery of a void can be made available upon its completion.

Organization	Verbatim Comment	Response
	once the final geologic study is completed. TPWD would like to be part of the discussion regarding final void protection measures.	
Texas Parks and Wildlife Department (TPWD) - Bats	Table 3.8-3 states that there is suitable habitat (limestone caves) within the study area for the Cave myotis bat (Myotis velifer) and Table 3.8-6 states that the proposed project "may impact" this species. TPWD notes that this species also roosts in rock crevices, old buildings, carports, under bridges, and in abandoned Cliff Swallow (Petrochelidon pyrrhonota) nests. Section 3.8.2 (page 245) in the DEIS states that a Barn Swallow's (Hirundo rustica) nest was observed in a culvert within the proposed project ROW during the December 2013 site visit. This culvert would not be impacted by the proposed project. Cliff swallow nests were also observed in additional surveys. These nests were observed to be inactive at the time of the surveys. TPWD also notes that the study area may contain suitable habitat for other bat species, such as the Brazilian free-tailed bat (Tadarida brasiliensis). Section 6.6.1 (page 313) in the DEIS states "Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable, and to avoid the potential to disturb any breeding Cave myotis bats. No bats were observed during the field surveys in December 2013. Prior to any construction activities, particular attention would be paid to the potential for birds and bats to be roosting in culverts and under bridges." Recommendation: TPWD recommends that the project area be surveyed for use by bats prior to construction. TPWD also recommends that bat-friendly roosting features be incorporated into the design of the new bridges being proposed by this project to help reduce impacts to these species that may be caused by loss of habitat. Alternately, if the incorporation of bat-friendly roosting features is not feasible, TPWD recommends TxDOT install artificial roost structures such as bat houses on or near the bridge structures. For information on how to create bat roosts in highway structures, TPWD recommends reviewing Bats in American Bridges which was developed by Bat Conservation International and can be found online at http://www.batcon.org/pdfs/bridges/BatsBridges2.pdf.	No bats of any species were observed in karst features within the SH 45SW right-of-way while conducting karst excavations and biota collections in the spring and summer of 2014. Because potential roost sites are expected to be reasonably plentiful in the greater Project Area region, it is expected that some cave myotis fly and hunt over the SH 45SW right-of-way on a regular basis during the warmer months of the year. Construction of SH 45SW could, therefore, result in the loss of vegetation that supports a portion of the flying insects that provide the prey base for this species. Given the restricted nature of the proposed project, the loss of this vegetation is not likely to cause significant impacts to this species or alter its status in the region. The bridge that would be constructed over Bear Creek might be used for roosting by cave myotis, thereby providing beneficial shelter. Further information is provided in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.

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Texas Parks and Wildlife Department (TPWD) - Bracted twistflower	The DEIS does not include the Bracted twistflower in Table 3.8-2 (Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties) or Table 3.8-5 (Potential for Take/Impacts to Threatened and Endangered Species). This species inhabits Oak-juniper woodlands and associated openings on slopes and in canyon bottoms with shallow, well drained, gravelly clays and clay loams over limestone. The Bracted twistflower is often found amid dense shrub growth where some protection for browsing animals is afforded. The Bracted twistflower is endemic to south-central Texas, with many of the occurrences in rapidly developing urban areas. Several sites have been extirpated by housing developments. Browsing pressure has increased due to the introduction of domestic and exotic animals as well as an overabundance of white-tailed deer, particularly in urban areas (NatureServe, 2014). After a review of habitat descriptions in the DEIS, the project location, project photographs, and aerial photographs, it appears that suitable habitat for this species may occur within the study area. Recommendation: TPWD recommends TxDOT revise the DEIS to include the Bracted twistflower in the above-mentioned tables as well as a discussion of potential impacts. TPWD also recommends the project area be surveyed by a qualified biologist familiar with the identification of this species during its mid-April to late-May flowering period, prior to construction. If plants are found in the path of construction, including the placement of staging areas and other project related sites, this office should be contacted for further coordination and possible salvage of plants and/or seeds for seed banking. Plants not in the direct path of construction should be protected by markers or fencing and by instructing construction crews to avoid any harm.	Vegetation in the right-of-way on the slope that leads down to Bear Creek from the north shares some characteristics of bracted twistflower habitat in that it consists of semi-open woodland containing a moderately diverse assemblage of shrub species. However, none of the right-of-way overlies massive layers of low-porosity limestone. Overall, the geology and topography of the SH 45SW right-of-way do not match the geology and topography present in areas where this species is known to occur, and most vegetation within the right-of-way does not have the structure typically associated with species occurrence. These reasons, coupled with location of the Project Area on the Hays County line where the species is not known to occur, suggests it is highly doubtful that bracted twistflower is present in the SH 45SW right-of-way. Consequently, construction of SH 45SW is not expected to cause adverse impacts to this species. Additional information provided in Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.

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Texas Parks and Wildlife Department (TPWD) - CSGCN Invertebrates	Section 3.8.2 (pages 253 and 254) in the DEIS states "The proposed project has the potential to impact several SGCN species by affecting potentially suitable habitat present within the proposed project ROW. However, based on TXNDD data, none of these species are known to have been recorded within the proposed project ROW." Recommendation: TPWD notes that the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within the project area. These data are not inclusive and cannot be used as presence/absence data. They represent species that could potentially be in the project area. This information cannot be substituted for on-the-ground surveys. TPWD recommends TxDOT include a statement in the document conveying that the TXNDD data cannot be used as presence/absence data.	A footnote was added containing this information.
Texas Parks and Wildlife Department (TPWD) - CSGCN Invertebrates	Section 3.8.2 (page 254) also states "Based on best currently available karst information (Veni, 2007; aci, 2007), the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state owned ROW. A karst survey conducted by a qualified geologist is currently being conducted to verify this information. Mitigation for SGCNs would not be required as there are no official federal or state regulations protecting these species. Therefore, no further action on impacts to these species is required. However, Best Management Practices (BMPs) put in place to protect water quality would likely also protect the majority of the potentially impacted SGCNs." Recommendation: As previously mentioned, TPWD recommends TxDOT also contact the Texas Speleological Survey to formally request data on known caves, karst features, springs, and karst dwelling species in order to receive the most accurate data on such features.	TxDOT and its consultants have a variety of data sources concerning known karst features in and nearby the right-of-way. These data sources include a Texas Speological Survey feature inventory by quadrangle, Veni & Associates, 2000, and other studies of the area. Additional information on karst features and karst dwelling species provided in the Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas.

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Texas Parks and Wildlife Department (TPWD) - CSGCN Invertebrates	Section 3.8.2 (page 254) also states "Based on best currently available karst information (Veni, 2007; aci, 2007), the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state owned ROW. A karst survey conducted by a qualified geologist is currently being conducted to verify this information. Mitigation for SGCNs would not be required as there are no official federal or state regulations protecting these species. Therefore, no further action on impacts to these species is required. However, Best Management Practices (BMPs) put in place to protect water quality would likely also protect the majority of the potentially impacted SGCNs." Comment: TPWD notes that the proposed project is likely to impact karst invertebrates. At a minimum, some runoff into caves and streams will occur during high flow events. Design plans and the implementation of water quality BMPs attempt to minimize this impact, but it is likely that there will be some impact. It is also likely that SGCN surface invertebrates will be impacted by vehicle collisions, as these surface species all have flying adult forms.	The technical report "Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas" and the "SH 45SW Biological Evaluation" address the water quality and quantity effects of the roadway, design and best management practice practices employed to protect the water, and any impacts the roadway may have on karst invertebrates and Species of Greatest Conservation Need. The technical reports are appended to the Final EIS (See Appendix M).
Texas Parks and Wildlife Department (TPWD) - CSGCN Invertebrates	Section 3.8.2 (page 254) also states "Based on best currently available karst information (Veni, 2007; aci, 2007), the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state owned ROW. A karst survey conducted by a qualified geologist is currently being conducted to verify this information. Mitigation for SGCNs would not be required as there are no official federal or state regulations protecting these species. Therefore, no further action on impacts to these species is required. However, Best Management Practices (BMPs) put in place to protect water quality would likely also protect the majority of the potentially impacted SGCNs." Recommendation: As previously mentioned, the DEIS states that based on best currently available karst information, the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state-owned ROW. TPWD notes that designation of the area as Karst Zones 3 and 4 indicates that the area probably does not contain listed karst invertebrates but does not indicate the absence of karst-dependent SGCN. Table 3.8-3 in the DEIS also states that the Cave bandit spider (Cicurina bandida), an SGCN, is known from	The Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project technical report fully supports the "no impact" determination for any listed karst species. This report was made available to the participating agencies and the public on Nov. 7, 2014 and includes detailed methods and results of investigations. The supportive details in this technical report is incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation and its attachments, including Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.

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	Flint Ridge Cave, which is located 150 feet outside of the state-owned ROW. It is unclear to TPWD why karst invertebrates are not expected to be found within the state-owned ROW when there are known observations just outside the ROW. TPWD recommends TxDOT further explain the reasoning behind this statement.	
Texas Parks and Wildlife Department (TPWD) - Ecologically Significant Stream Segment	The proposed project would cross tributaries of Onion Creek. Onion Creek is considered to be an Ecologically Significant Stream Segment (ESSS) from the confluence with the Colorado River in Travis County to the most upstream crossing of FM 165 in Blanco County. The designation is based on: • Riparian conservation area - McKinney Falls State Park • High water quality • Exceptional aquatic life • High aesthetic value • Diverse benthic macroinvertebrate community TPWD has identified ESSSs throughout the state to assist regional water planning groups in identifying ecologically unique stream segments under Texas Administrative Code (TAC) Title 31 §357.43 and §357.8. Until approved by the legislature this is not a legal designation. The stream segments are identified through extensive review by TPWD staff and are determined to be ecologically important. Information regarding criteria for designation as an ESSS can be found on the TPWD website at http://www.tpwd.state.tx.us/landwater/water/environconcems/water issues/sig segs/ or in 31 TAC 357.43 and 357.8. Recommendation: As previously mentioned, TPWD recommends the project be designed to avoid adverse water quality impacts to Onion Creek and its tributaries.	Comment noted. The project is designed to avoid adverse water quality impacts to Onion Creek and its tributaries.
Texas Parks and Wildlife Department (TPWD) - Federal Laws - Endangered Species Act (ESA)	Golden-cheeked Warbler (Setophaga chrysoparia) - Federally and Statelisted Endangered There are two TXNDD occurrences for the Golden-cheeked Warbler (GCWA) within the study area. In addition to the known occurrences, review of a predictive habitat model for the GCWA (Diamond, et al. 2007). Range-wide Modeling of Golden-cheeked Warbler Habitat. Section 6 Project E-72-R, Final Report, Texas	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat within and adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. The supportive details in these technical reports are

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	Parks and Wildlife Department, Austin, Texas) indicates that there is a high potential for suitable habitat for the GCWA within the study area. A map denoting the areas containing potential habitat is attached for your reference.	incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M).
Texas Parks and Wildlife Department (TPWD) - Federal Laws - ESA	Black-capped Vireo (Vireo atricapilla) - Federally and State-listed Endangered According to the TXNDD there is one occurrence of the federally- and statelisted endangered Black-capped Vireo (BCVI) located within the study area. Recommendation: TPWD recommends TxDOT perform breeding season surveys for the GCWA and BCVI in areas containing suitable habitat that may be impacted as a result of the proposed project. Even if habitat for these species would not be directly impacted by vegetation removal, if nesting pairs are present in the surrounding vegetation they could be disrupted by noise and activity during construction. Because the definition of take in the ESA includes harming or harassing a listed species, this disturbance could constitute a violation of the ESA. TPWD recommends TxDOT conduct presence/absence surveys according to USFWS GCWA Survey Guidelines (htt]://www.fws.gov/southwest/es/AustinTexasiESA Sci pennits.html). The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols and mitigation for these federally-listed species.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that a survey for Black-capped Vireos and an evaluation of the vegetation determined that no habitat for the Black-capped Vireo occurs within or adjacent to the project right of way. The supportive details in this technical report are incorporated into the Final EIS and summarized in the SH 45SW Biological Evaluation (See Appendix M).
Texas Parks and Wildlife Department (TPWD) - Federal Laws - ESA	Barton Springs salamander (Eurycea sosorum) - Federally and State-listed Endangered According to the TXNDD there is one occurrence of the federally and statelisted endangered Barton Springs salamander located within the study area. Recommendation: TPWD recommends that that study area be surveyed for springs. If springs are present, TPWD recommends TxDOT perform a salamander survey. If protected salamanders are present on-site and would be adversely impacted by the proposed project, then TPWD and the USFWS should be contacted for guidance on protection of this species.	No springs were found in the state-owned right-of-way during field investigations. The technical report Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas and the SH 45SW Biological Evaluation address the water quality and quantity effects of the roadway, design and best management practice practices employed to protect the water, and any impacts the roadway may have on the salamanders. The technical reports are appended to the Final EIS (See Appendix M). The report concludes that the project would not impact the two salamander species.

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Texas Parks and Wildlife Department (TPWD) - Federal Laws - ESA	The project study area is predominantly located in Karst Zone 3 which includes areas having a low probability of containing suitable habitat for federally-listed karst invertebrate species. Recommendations: The USFWS karst invertebrate survey requirements recommend on-the-ground surveys for projects located in Karst Zone 3 to determine if karst features containing endangered invertebrates are likely to occur. The USFWS Section 10{a)(1){A) Karst Invertebrate Survey Requirements Survey Protocol may be found at http://www.fws.gov/southwest/es/Documents/R2ES/Karst Survey Protocols_20110908.pdf. If not done to date, TPWD recommends that a karst feature survey be performed in accordance with USFWS karst survey protocols to determine if endangered cave invertebrate species may be present and affected by the project.	The technical report Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas and the SH 45SW Biological Evaluation address the water quality and quantity effects of the roadway, all design and best management practice practices employed to protect the water, and any impacts the roadway may have on federally-listed karst invertebrate species. The technical reports are appended to the Final EIS (See Appendix M). The report concludes that the project will not impact federally-listed karst invertebrate species.
Texas Parks and Wildlife Department (TPWD) - Federal Laws - Migratory Bird Treaty Act	The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds. Recommendation: If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends TxDOT survey the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. Any vegetation (trees, shrubs, and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.	TxDOT is committed to complying with the Migratory Bird Treaty Act, including following TxDOT protocols regarding vegetation clearing and other preemptive measures to avoid migratory bird species. In the event migratory birds are encountered on-site during project construction, every effort would be made to avoid protected birds, active nests, eggs, and/or young. All methods would be approved by the Austin District Biologist well in advance of planned use.

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Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - Barton Springs salamander (BSS)	Section 3.8.1 (page 229) in the DEIS provides the following statement regarding the Barton Springs salamander: The Barton Springs salamander was until recently only known from spring outlets in Barton Springs. However, in 2009 one individual of the species was reported at a site approximately 6.5 miles southwest of Barton Springs [Blowing Sink], though this sighting has not yet been confirmed by USFWS (TXNDD. 2013). In 2012, researchers collected Eurycea sp. salamanders from a spring outlet along Bear Creek approximately two miles west of the proposed alignment (A. Gluesenkamp, personal communication, February 26, 2014). The taxonomic identity of the salamanders in both observations discussed above has yet to be conclusively determined. Therefore, discussion involving the Barton Springs salamander in this document will focus exclusively on the species as it exists within Barton Springs. It appears that this species occurs primarily in non-subterranean waters, usually under rocks or gravel near spring outlets. Like the Austin blind salamander, this species is highly dependent on the water quality of Barton Springs. There is no known spring habitat or subterranean aquatic habitat within karst features for the Barton Springs salamander within the study area. Therefore, this species is not expected to occur within the study area. TPWD does not concur with the above statement regarding the Barton Springs salamander. The attached Section 6 TX E-122-R Final Report: Status of newly discovered cave and spring salamanders (Eurycea) in southern Travis and northern Hays Counties states the following: The populations of Eurycea at Blowing Sink and Cold Spring (and Spillar Ranch and Taylor Springs) are indistinguishable mitochondrially from the "nana-/ike" hap/otype group at Barton Springs. They share nuclear sequence substitutions or alleles, and microsatellite alleles, with E. sosorum that are rare or undetected in E. nana. Although there is evidence that this group - Barton Spring. Cold Spring, and Blowing Sink - may not be completely panmictic (randomly interbreeding), they appear to represent the same species, and population genetic analyses of the microsatellite data reveal substantial to very high levels of gene flow, especially between Barton Springs and both Cold Spring and Blowing Sink (although gene flow appears to be toward Barton Springs, in that the E. sosorum - specific mitochondrial haplotype was not seen in	The technical report Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas and the SH 45SW Biological Evaluation address the water quality and quantity effects of the roadway, design and best management practice practices employed to protect the water, and any impacts the roadway may have on the salamanders. The Biological Evaluation is appended to the Final EIS (See Appendix M) and the Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas report is appended to the Biological Evaluation. The report concludes that the project would not impact the two salamander species.

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	these populations). Spillar Ranch exhibits less nuclear variation overall, bm its nuclear genetic composition is consistent with that of E. sosorum and not E. nano. The Taylor Springs population is somewhat problematic, it appears to be small and isolated, with a very low level of genetic variation and little evidence of ongoing genetic exchange with any of the other populations or species. However, its genetic composition is also most consistent with that of E. sosorum and the other populations, exclusive of E. nano. Recommendation: Please note that the above-mentioned populations found at Spillar Ranch Spring are located approximately 2,480 feet outside of the study area boundary. TPWD recommends revising the DEIS text to include above-mentioned populations of Eurycea sosorum and address potential impacts to these populations in addition to the populations found at Barton Springs. The above-mentioned Eurycea sosorum observations have been added to the TXNDD since the completion of the DEIS. TPWD recommends requesting the most current TXNDD data before the preparation of the FEIS and updating the document accordingly.	
Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - BSS	TPWD notes that the USFWS works cooperatively with species experts like the State Herpetologist, Dr. Andy Gluesenkamp, as well as Dr. Hillis and Dr. Chippindale, on species identifications. USFWS acknowledgement of identifications made by taxon experts may lag by years and, often, only comes after peer-reviewed papers have been published. Lack of USFWS confirmation of species identification does not necessarily indicate that the taxonomy is undetermined. Recommendation: Dr. Gluesenkamp believes that the above-mentioned personal communication was inaccurately interpreted in the DEIS. TPWD recommends contacting Andy Gluesenkamp at Andy.Gluesenkamp@tpwd.texas.gov to resolve this statement and revise accordingly for its inclusion in the FEIS.	In accordance with the Memorandum of Understanding between TxDOT and Texas Parks and Wildlife Department. Coordination with Texas Parks and Wildlife Department has been ongoing. TxDOT welcomes any comments from Dr. Gluesenkamp.
Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - BSS	Section 3.6.2 (page 160) in the DEIS states "no springs are mapped in the study area by the Texas Water Development Board (TWDB, 2013)." Additionally, no springs were observed in the state-owned ROW during field surveys. Recommendation: Given the proximity of Spillar Ranch Spring and known populations of Eurycea sosorum as concluded in the above-mentioned Section 6 report, TPWD recommends TxDOT	Barton Springs/Edwards Aquifer Conservation District has provided additional information regarding springs and the results are included in the Final EIS. Professional karst geologists with access to the Texas Speleological Survey conducted surveys of the state-owned right-of-way.

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	also contact the Texas Speleological Survey to formally request data on known caves, karst features, springs, and karst dwelling species in order to receive the most accurate data on such features.	
Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - GCW	The DEIS describes the study area as containing potential suitable habitat for the Golden-cheeked Warbler and mentions several Golden-cheeked Warbler observations that were documented within the study area. Examples within the DEIS of descriptions of suitable habitat and Golden-cheeked Warbler observations are as follows: The following is a bulleted list of citations. The full quotes for these citations are on pages 4 and 5 of the TPWD comment Letter. • Table 3.8-2 (page 223) in the column labeled "Potential for habitat to occur in the study area" • Section 3.8.1 (page 230) • Section 3.8.1 (page 230) • Section 3.8.2 (page 251) • Section 3.8.3 (page 255) The caption on Photo 7 in Appendix G (Study Area Photographs) Recommendation: After a review of project photographs, aerial photographs, habitat descriptions in the DEIS, the number of observations recorded in the study area, the TXNDD, and a predictive habitat model for the Golden-cheeked Warbler (Diamond, 2007), TPWD finds no evidence that suitable habitat for the Golden-cheeked Warbler is absent within the state owned ROW. The DEIS does not provide clear reasoning why the suitable habitat survey results were determined to be negative within the ROW. Based on the available information, TPWD finds no difference between the habitat in the ROW and the occupied or previously occupied habitat in the remainder of the study area. TPWD recommends TxDOT further explain this determination in the FEIS.	The Draft EIS provided a summary of previously conducted and preliminary investigations. The details of previously conducted Golden-cheeked Warbler surveys and habitat assessments since 2000 are presented in the State Highway 45SW: Golden-cheeked Warbler Technical Report (Appendix M) along with the best available scientific and commercial data, and is summarized in the Final EIS. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. This report addresses the vegetation within and adjacent to the project comparing the characteristics with that of known occupied Golden-cheeked Warbler habitat. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the Golden-cheeked Warbler has used the habitat over the past 14 years.

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Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - GCW	The DEIS describes the study area as containing potential suitable habitat for the Golden-cheeked Warbler and mentions several Golden-cheeked Warbler observations that were documented within the study area. Examples within the DEIS of descriptions of suitable habitat and Golden-cheeked Warbler observations are as follows: • Table 3.8-2 (page 223) in the column labeled "Potential for habitat to occur in the study area" Yes - Oak-juniper woodlands occur within the study area."• Section 3 .8.1 (page 230) states "Based on available data, Golden-cheeked Warbler presence/absence surveys have been completed within portions of the study area. In 2003, SWCA Environmental Consultants (SWCA) surveyed areas of potential habitat in the vicinity of Bear Creek. An "apparently unmated male warbler" was observed during the first three presence/absence surveys to the west of the proposed ROW, but not the last three. The 2003 results stated that the Golden-cheeked Warbler "was believed to have abandoned the area" (SWCA, 2003). Figures provided by SWCA from a letter report produced in 2013 indicate that Goldencheeked Warblers were heard on [City of Austin] COA WQPL lands within the study area south of Bear Creek to the south of Shady Hollow Estates and east of Bear Creek to the west of Shady Hollow Estates (SWCA, 2013). These surveys did not cover the existing state-owned ROW."• Section 3.8.1 (page 230) states "Texas A&M University used a model (Texas A&M, 20 I Oa) to estimate the amount of Golden-cheeked Warbler habitat remaining within Texas. Based on a review of the results as well as a review of recent aerial photography and survey observations, there are approximately 2,010 acres of potential Golden-cheeked Warbler habitat available within the study area. Data from Texas Natural Diversity Database (TXNDD) and other studies indicate that there have been Golden-cheeked Warbler sightings within the study area (TXNDD, 2013; City of Austin, 2011). There is oak-juniper woodland habitat found throughout the study area." • Section 3.8.2 (page 251) states "Habitat sharing some of the basic characteristics of Golden-cheeked Warbler habitat was observed within the existing state-owned ROW during field surveys conducted in 2013. Golden-cheeked Warblers have been sighted immediately adjacent to the ROW during recent COA surveys (SWCA, 2013)."• Section 3.8.3 (page 255) states "The closest known confinned sighting of Golden-cheeked Warblers to the state-owned ROW is separated from the proposed project by an LCRA utility easement. This easement runs immediately	A report, State Highway 45SW: Golden-cheeked Warbler Technical Report, has been completed that assesses the best available scientific data including Golden-cheeked Warbler surveys from 2000 through 2014, conducted following the U.S. Fish & Wildlife Service's protocols. This report addresses the vegetation within and adjacent to the project comparing the characteristics with that of known occupied Golden-cheeked Warbler habitat. Texas Natural Diversity Database request noted. In the Final EIS, Section 3.8 has been updated to reflect newer information from the Golden-cheeked Warbler technical report.

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	adjacent to the proposed project ROW in this area. Therefore, there is already edge habitat separating the area of this sighting from the state-owned ROW. Based on figures from a 2013 presence/absence survey (SWCA, 2013) there are two more known sightings of Golden-cheeked Warblers to the west of the state-owned ROW, but they are over 600 feet away from the western boundary of the ROW. Therefore the existing data seem to indicate that edge habitat created by the proposed project would not negatively affect Goldencheeked Warblers." • The caption on Photo 7 in Appendix G (Study Area Photographs) states "potential Golden-cheeked Warbler habitat." Recommendation: Several Golden-cheeked Warbler observations are mentioned throughout the DEIS that were observed during various surveys performed by SWCA and the COA. TPWD recommends that SWCA and the COA submit these observations to the TXNDD if they have not done so to date. SWCA and the COA can report these observations by completing and submitting a TXNDD reporting form which can be found online at http://www.tpwd.state.tx.uslhuntwild/wild/wildlife diversity/txndd/ submit.phtml. The TXNDD staff can be contacted at TexasNatural.DiversityDatabase@tpwd.texas.gov or (51 2) 389-8744.	
Texas Parks and Wildlife Department (TPWD) - Federally Listed Species - Golden-cheeked Warbler (GCW)	The Executive Summary (pages ES-13 and ES-14) states "Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS [U.S. Fish and Wildlife Service] guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW." Recommendation: The above-mentioned guidelines (USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys and Habitat Assessments for Endangered Golden-cheeked Warblers) outline very detailed processes for surveys and reporting. These guidelines require that habitat assessment reports be submitted to the USFWS if the assessed area meets any of the vegetation associations outlined	The Draft EIS provided a summary of previously conducted and preliminary investigations. The details of previously conducted Golden-cheeked Warbler surveys and habitat assessments since 2000 are presented in the State Highway 45SW: Golden-cheeked Warbler Technical Report (Appendix M) along with the best available scientific and commercial data, and is summarized in the Final EIS. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the Golden-cheeked Warbler has used the habitat over the past 14 years.

Organization	Verbatim Comment	Response
	as potential Golden-cheeked Warbler habitat as stated in the guidelines. The DEIS states in several places that the study area contains potential suitable habitat for this species (discussed below), so TPWD assumes the assessed area meets one of the vegetation associations outlined in the USFWS guidelines. Therefore, TPWD assumes that a habitat assessment report and presence/absence survey report were prepared and submitted to the USFWS for this project. TPWD recommends TxDOT attach those reports as an appendix in the FEIS.	
Texas Parks and Wildlife Department (TPWD) - Impacts to Vegetation/Wildlife Habitat	Section 6.6.1 (page 313) of the DEIS states that of the approximately 309 acres of vegetation within the proposed project ROW, 159 acres would be impacted either permanently or temporarily under the Build Alternative through the laying of new pavement, clearing of trees and brush, and construction equipment staging areas. According to the Ecological Mapping Systems of Texas (EMST), the majority of the habitat impacted within the ROW is Deciduous Oak/Evergreen Motte and Woodlands of the Edwards Plateau. Approximately 3 acres of riparian and floodplain vegetation would be impacted by the proposed project. Upon completion of construction activities associated with the proposed project, disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines. The DEIS did not discuss plans to mitigate for vegetation removal. Recommendation: TxDOT's Vegetation Management Guidelines are not provided in the DEIS for review. As a precautionary measure, TPWD discourages the use of any non-native vegetation in landscaping and revegetation and recommends using locally adapted native species. If the seed mix outlined in TxDOT's Vegetation Management Guidelines contains any seeds from non-native plants, TPWD recommends using a seed mix that contains seeds from only locally adapted native species. Lists of invasive species to avoid can be accessed online at http://www.texasinvasives.org/.	TxDOT has a native seed mix for replanting on disturbed soils.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Impacts to Vegetation/Wildlife Habitat	Due to the fact that the project will be on new location, vegetation impacts are anticipated as a result of the proposed project. Recommendation: TPWD recommends clearing the least amount of vegetation possible for the construction of this project, especially undisturbed native vegetation and mature trees. TPWD recommends in kind on-site replacement/restoration of the native vegetation wherever practicable. If on-site mitigation for tree removal is not practicable, TPWD recommends off-site mitigation for removed trees. There are several parks managed by the City of Austin and Travis County located adjacent to the project area that would be appropriate locations to mitigate for tree removal. Examples of nearby parks include Old San Antonio Park, Bauerle Ranch Park, Mary Moore Searight Park, Manchaca Gardens Park, as well as several others. To minimize adverse effects, activities should be planned to preserve any mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation are high value to wildlife as food and cover. TPWD generally recommends that trees greater than 12-inches in diameter-at breast-height (dbh) to be removed be replaced at a ratio of three trees for every one (3:1) lost to the extent practicable, either on-site or off-site. Trees less than 12-inches in dbh should be replaced at a 1:1 ratio. Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species. A three to five year maintenance plan that ensures an 85 percent survival rate should be developed for the replacement trees.	A tree survey will be completed prior to final design and an effort to minimize loss to significant trees will be made. The roadway was designed to avoid impacts to karst features first and foremost, so design changes are not anticipated. The shared use path will be designed to avoid as many trees as possible. The areas outside of the right-of-way and easements will not be impacted. Impacts to vegetation, including trees, in the right-of-way will be avoided as much as possible. Additionally, not all of the right-of-way and easements will be cleared of vegetation.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Impacts to Vegetation/Wildlife Habitat	Onion Creek and several of its tributaries including Bear Creek and Little Bear Creek are located within the study area. There are also several wetlands and depressional wetland ponds within the study area. These water crossings and wetlands are shown on the attached Water Resources map. Removal of vegetation along stream systems and wetlands can be damaging to fish and wildlife habitat and to natural processes associated with these systems. Vegetation associated with forested stream systems usually reflects wildlife habitats with the highest value. The degree of adverse impact to habitat resulting from this vegetation loss relates directly to the quantity of the vegetation loss and quality of the vegetation assemblage in fulfilling life requisites of those organisms using it. Recommendation: Riparian vegetation associated with streams and wetlands acts as a natural buffer and should remain undisturbed to the extent feasible to help protect water quality and preserve wildlife cover, food sources, and travel corridors. TPWD recommends that TxDOT route the proposed project in an area that would have the lowest impact on water crossings and wetlands as well as associated riparian habitat. If wetland or stream impacts cannot be avoided, TPWD requests that TxDOT mitigate for any wetland and stream impacts and prepare a wetland mitigation plan. The wetland mitigation plan should be developed in consultation with TPWD.	The bridge over Bear Creek is planned to span Bear Creek to avoid impacts to the riparian zone.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Impacts to Vegetation/Wildlife Habitat	Section 6.6.1 (page 313) of the DEIS states that of the approximately 309 acres of vegetation within the proposed project ROW, 159 acres would be impacted either permanently or temporarily under the Build Alternative through the laying of new pavement, clearing of trees and brush, and construction equipment staging areas. According to the Ecological Mapping Systems of Texas (EMST), the majority of the habitat impacted within the ROW is Deciduous Oak/Evergreen Motte and Woodlands of the Edwards Plateau. Approximately 3 acres of riparian and floodplain vegetation would be impacted by the proposed project. Upon completion of construction activities associated with the proposed project, disturbed areas would be restored and seeded according to TxDOT's VegetationManagement Guidelines. The DEIS did not discuss plans to mitigate for vegetation removal. Recommendation: TPWD identifies the SH 45SW state resource habitat impacts as impacts that deserve special consideration during the Interagency Memorandum of Understanding (MOU) Implementation Team review of the state-wide aggregated impacts for the purpose of mitigation for those impacts. Special consideration should be provided based on the quantity of impacts occurring as a result of one project, the increase in impacts to adjacent undeveloped property due to new access as a result of the proposed roadway, and the mid-to-high quality of the habitat being directly impacted. Impacted MOU habitat types as a result of the proposed project include Edwards Plateau Savanna Woodland and Shrubland (129.84 acres), riparian and floodplain vegetation (3.J acres), and Disturbed Prairie (6.6 acres). TPWD recommends coordinating vegetation mitigation efforts with this office.	Impacts to vegetation, including trees, will be avoided as much as possible. The areas outside of the right-of-way and easements will not be impacted. Additionally, not all of the right-of-way and easements will be cleared of vegetation. Vegetation clearing will be limited to the minimum amount needed to accommodate the new roadway and shared use path. As there is no law requiring mitigation, no mitigation is proposed.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Plants	Table 3.8-3 in the DEIS states that there is potential for habitat to occur in the study area for the Basin bellflower (Campanula reverchonii), Boerne bean (Phaseolus texensis), Correll's false dragonhead (Physostegia correllii), Hill Country wild mercury (Argythamnia aphoroides), Texabama croton (Croton alabamensis var texensis), and Warnock's coral-root (Hexalectris warnockii), and Table 3.8-6 states that the proposed project "may impact" these species. Section 3.8.1 (page 238) in the DEIS also states "Plant SGCNs have the potential to occur in the undeveloped portions of the study area." Recommendation: TPWD recommends that the project area be surveyed for the above-listed SGCN plant species. On-the-ground surveys should be performed by a qualified biologist familiar with the identification of these species prior to construction. Surveys should be conducted when these species are most detectable and identifiable (usually during the flowering period), and disturbance of these species should be avoided during construction to the extent feasible. If plants are found in the path of construction, including the placement of staging areas and other project related sites, TPWD requests TxDOT contact this office for further coordination and possible salvage of plants and/or seeds for seed banking. TPWD recommends plants not in the direct path of construction be protected by markers or fencing and by instructing construction crews to avoid any harm.	Based on the description of possible habitat in Bear Creek and the project design to span Bear Creek with a bridge, it is highly unlikely that the project would impact the Boerne bean, the only Species of Greatest Conservation Need plant species with the potential to occur in the right-of-way. This species and the others listed in the comment are addressed in the Biological Evaluation (Appendix M of the Final EIS). As there is no law requiring survey of Species of Greatest Conservation Need plant species, no survey is proposed.
Texas Parks and Wildlife Department (TPWD) - Previous Coordination - submitted in Sept. 2013	Previous Coordination: TPWD provided information and recommendations regarding the SH 45SW study area to TxDOT on September 9, 2013. This response was not included in Appendix K of the DEIS; therefore, it is attached for your reference. Recommendation: Please review previous TPWD correspondence and consider the recommendations provided, as they remain applicable to the project as proposed but are not repeated in this letter. TPWD also recommends including this coordination letter in Appendix K of the Final EIS (FEIS).	The original recommendations provided in the September 2013 letter are discussed in the rows below with reference to September 2013 submittal. The Texas Parks and Wildlife Department coordination letter is included in Appendix K of the Final EIS.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Rare Species	Texas garter snake (Thamnophis sirtalis annectens) could be impacted as a result of the proposed project. There are two TXNDD occurrences for the Texas garter snake located within the project study area. Recommendation: Snakes are generally perceived as a threat and killed when encountered during clearing or construction. Therefore, TPWD recommends that personnel involved in clearing and construction be informed of the potential for the rare Texas garter snake to occur on the project site. Personnel should be advised to avoid impacts to this snake as it is non-venomous and poses no threat to humans. Contractors should avoid contact with this species if encountered and allow the snake to safely leave the premises.	The TxDOT/Texas Parks and Wildlife Department Memorandum of Understanding Programmatic Agreement for best management practices includes a best management practice for snakes that will be included in the Environmental Permits, Issues and Commitments sheet for the construction contractor and included in commitments portion of the Final EIS.
Texas Parks and Wildlife Department (TPWD) - Rare Species	Spot-tailed earless lizard (Holbrookia lacerata) could be impacted as a result of the proposed project. There are three TXNDD occurrences for the Spot-tailed earless lizard located within the project study area. In January 2010, the species of concern Spot-tailed earless lizard was petitioned for listing under the ESA. On May 24, 2011, the USFWS issued a 90-day finding on that petition. Based on their review, the USFWS found the petition presents substantial scientific or commercial information indicating that listing the Spot-tailed earless lizard may be warranted. The USFWS has therefore initiated a status review to determine if listing is in fact warranted. Based on this status review, the USFWS will issue a 12-month finding on the petition. Recommendation: TPWD recommends TxDOT monitor the listing status of the Spot-tailed earless lizard throughout project planning and construction and perform required consultation, permitting, and mitigation with the USFWS if this species becomes listed under the ESA.	TxDOT will monitor the federal listing status of the species.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Rare Species	Plateau live oak/Little bluestem series (Quercus fosiformis/Schizachyrium series) could be impacted as a result of the proposed project. There is one TXNDD occurrence for the Plateau live oak/Little bluestem series (natural community) located within the project study area. Recommendation: TPWD recommends that construction crews be informed about the possibility of finding and avoiding harm to wildlife and native vegetation, since this would provide the best benefit for wildlife conservation overall.	Impacts to native vegetation in the right-of-way will be avoided as much as possible. Notification will be made in the project Environmental Permits, Issues and Commitments.
Texas Parks and Wildlife Department (TPWD) - Rare Species	Recommendation: Please review the TPWD county lists of rare and protected species for Travis and Hays Counties, as rare species in addition to those discussed above could be present depending upon habitat availability. These lists are available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/.	The Texas Parks and Wildlife Department county list was reviewed and all species were addressed in the Biological Evaluation of SH 45SW, which is appended to the Final EIS. Texas Parks and Wildlife Department county lists were referenced in Tables 3.8-5 and 3.8-6 (cited as Texas Parks and Wildlife Department 2013a).
Texas Parks and Wildlife Department (TPWD) - Reptiles	Table 3.8-3 in the DEIS states that there is appropriate habitat within the study area for the Texas garter snake (Thamnophis sirtalis annectens) and Table 3.8-6 states that the proposed project "may impact" this species. Recommendation: TPWD recommends construction personnel be advised to avoid impacts to this snake as it is non-venomous and poses no threat to humans. Contractors should avoid contact with this species if encountered and allow the snake to safely leave the premises.	Notice will be given to contractors in accordance with the TxDOT/Texas Parks and Wildlife Department Memorandum of Understanding Programmatic Agreement for Best Management Practices.
Texas Parks and Wildlife Department (TPWD) - Reptiles	Table 3.8-3 in the DEIS states that there is potential habitat (brushland habitat) within the study area for the Spot-tailed earless lizard (Holbrookia lacerata); however, Table 3.8-6 states that there is no habitat and that the project will not impact this species. After a review of the TXNDD, habitat descriptions in the DEIS, project location, project photographs, and aerial photographs, it appears that suitable habitat for this species may occur within the study area. Recommendation: TPWD recommends TxDOT resolve the discrepancy between Table 3.8-3 and Table 3.8-6 and state whether there is suitable habitat for the Spot-tailed earless lizard in the study area. Based on that determination, TPWD	Table 3.8-3 describes the larger study area, while Table 3.8-6 addresses the potential for impacts solely within the state-owned right-of-way. The species is further addressed in the Biological Evaluation of SH 45SW. TxDOT will monitor the listing status of the Spot-tailed earless lizard. As discussed in the Biological Evaluation, the spot-tailed earless lizard occurs in semi-open brushy prairie that contains patches of barren ground. Based on this description, the occurrence of this species in the SH 45SW right-of-way is not expected because it generally contains a well-developed grass cover. Therefore, it is considered doubtful that the construction and use of SH 45SW would adversely impact this species.

Organization	Verbatim Comment	Response
	recommends TxDOT determine whether the project has the potential to impact this species. TPWD also recommends TxDOT monitor the listing status of the Spot-tailed earless lizard throughout project planning and construction and perform required consultation, permitting, and mitigation with the USFWS if this species becomes listed under the Endangered Species Act. TPWD also recommends TxDOT avoid impacts to this species if encountered during construction.	
Texas Parks and Wildlife Department (TPWD) - Request for Revision of the DEIS and an additional opportunity to review and comment	TPWD advises review and implementation of these recommendations. Because studies that are needed to evaluate potential impacts of the proposed project were not complete when this DEIS was released (e.g. karst survey, geologic assessment), TPWD respectfully requests TxDOT revise the DEIS based on public comments and provide TPWD an updated DEIS for review. TPWD requests the opportunity to review and comment on the project once information from the current karst survey and geologic assessment have been completed and incorporated into the DEIS, and before the FEIS is prepared.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
Texas Parks and Wildlife Department (TPWD) - Species of Greatest Conservation Need (CSGCN) Invertebrates	Table 3.8-3 in the DEIS states that the Edwards Aquifer diving beetle (Haideoporus texanus) and the Ezell's cave amphipod (Stygobromus flagellatus) may occur in subterranean caves and pools beneath the study area; however, they are listed as not having the potential for habitat to occur within the study area. Table 3.8-6 in the DEIS then states that the Edwards Aquifer diving beetle and the Ezell's cave amphipod do have habitat present within the study area and that the proposed project will have no impact on these species. Recommendation: TPWD recommends TxDOT resolve the discrepancy between Table 3.8-3 and Table 3.8-6 and state whether there is suitable habitat for the Edwards Aquifer diving beetle and the Ezell's cave amphipod in the study area. Based on that determination, TPWD recommends TxDOT determine whether the project has the potential to impact these species.	These species are addressed in the Biological Evaluation that is appended to the Final EIS. Both species' known ranges are restricted to the San Antonio segment of the Edwards Aquifer, as discussed in Biological Evaluation. Tables 3.8-3 and 3.8-6 in the Final EIS have been updated.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - State Laws - State-listed Species - Aquatic Resources	TPWD notes that under Parks and Wildlife Code Section 12.015, 12.019, 66.015 and TAC 57.251-.259, TPWD regulates the introduction and stocking of fish, shellfish, and aquatic plants into public waters of the state. Activities in state waters that involve dewatering or relocation of fish, mussels, or aquatic plants need to be conducted in conjunction with an Aquatic Resources Relocation Plan. Upon completion, such plans are submitted to the appropriate TPWD Inland Fisheries or Coastal Fisheries Kills and Spills Team (KAST) for review. The purpose of these plans is to ensure that native fish, aquatic plants, and mussels are being handled properly and protected from danger during dewatering and/or relocation activities. Accordingly, a permit to introduce shellfish, finfish, and aquatic plants into public waters will be issued once the Aquatic Resources Relocation Plan is finalized and approved by the KAST. Recommendation: If dewatering activities, relocation of native fish or aquatic plants, or other activities that could result in take of aquatic species would be conducted, TPWD recommends TxDOT submit an Aquatic Resources Relocation Plan to Alan Butler, TPWD Region 1 KAST at alan.butler@tpwd.texas.gov to initiate coordination for a permit to introduce aquatic resources into public waters. Recommendation: TPWD recommends that impact avoidance measures for all native freshwater mussel species, regardless of state-listing status, be considered during project planning and construction.	The project would not require any dewatering activities or any relocation of aquatic species.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - State Laws - State-listed Species - Aquatic Resources	Based on a review of topographic maps and aerial photography of the project study area, it appears that Onion Creek and its tributaries may provide suitable habitat for freshwater mussels that may be present in Travis and Hays counties (listed below). Creeper (squawfoot) (Strophilus undulates) -Rare species False spike mussel (Quadrula mitchelli) -State-listed Threatened Golden orb (Quadrula aurea)-State-listed Threatened* Smooth pimpleback (Quadrula houstonensis) - State-listed Threatened* Texas fatmucket (Lampsilis bracteata)-State-listed Threatened* Texas fawnsfoot (Truncilla macrodon)-State-listed Threatened* Texas pimpleback (Quadrula petrina)-State-listed Threatened* *Federal Candidate for Listing Recommendation: TPWD recommends TxDOT take measures to avoid impacts to aquatic and riparian habitats, which would minimize impacts to aquatic species including rare freshwater mussels. If suitable habitat for freshwater mussels would be directly or indirectly impacted by the proposed project, TPWD recommends TxDOT perform a mussel survey prior to construction. Surveys should include any part of the channel that would be directly disturbed by construction as well as areas that may be blanketed by fine sediments downstream. If native mussels are found in the potentially impacted areas, TPWD recommends TxDOT contact this office regarding potential relocation of these species to an area that would not be disturbed by construction.	The Biological Evaluation of SH 45SW for the project addresses the mussel species. Surveys were conducted in 2013 and 2011, no mussels were found. The project is designed with all appropriate best management practices to protect any surface waters from being impacted by the project. No impacts to stream channels are anticipated as the proposed project would bridge 100-year floodplains and span the ordinary high water marks of streams.

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - State Laws - State-listed Species - Texas horned lizard	Texas homed lizard (Phrynosoma cornutum) - State-listed Threatened The project study area may provide suitable habitat for the Texas homed lizard. If present in the study area, the Texas homed lizard could be impacted by ground disturbing activities from construction. Homed lizards may hibernate on site in the loose soils few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Homed lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If homed lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities. Recommendation: TPWD recommends that a pre-construction survey be conducted to determine if homed lizards are present in the project study area. A useful indication that the Texas homed lizard may occupy the site is the presence of Harvester Ant (Pogonomyrmex barbatus) nests since Harvester Ants are the primary food source of homed lizards. The survey should be performed during the warm months of the year when the homed lizards are active. Fact sheets, including survey protocols and photos of Texas homed lizard may be found online at http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/texas_nature_trackers/horned_lizard/ and at http://www.tpwd.state.tx.us/huntwild/wild/species/thlizard/.	As discussed in the Biological Evaluation, the Texas horned lizard is now much more common in the western two-thirds of the state than in central or eastern Texas. Because this species occurs scarcely in the region, it is considered highly doubtful that the species is present in the state-owned right-of-way. Consequently, the construction and use of SH 45SW is unlikely to cause adverse impacts to this species (see Appendix M in the Final EIS).

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - State Laws - State-listed Species - Texas horned lizard	Texas homed lizard (Phrynosoma cornutum) - State-listed Threatened The project study area may provide suitable habitat for the Texas horned lizard. If present in the study area, the Texas homed lizard could be impacted by ground disturbing activities from construction. Horned lizards may hibernate on site in the loose soils few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Homed lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If homed lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities. Recommendation: TPWD recommends that a pre-construction survey be conducted to determine if homed lizards are present in the project study area. A useful indication that the Texas homed lizard may occupy the site is the presence of Harvester Ant (Pogonomyrmex barbatus) nests since Harvester Ants are the primary food source of horned lizards. The survey should be performed during the wann months of the year when the horned lizards are active. Fact sheets, including survey protocols and photos of Texas horned lizard may be found online at http://www.tpwd.state.tx.us/leaming/texas nature trackers/homed lizard/ and at http://www.tpwd.state.tx.us/huntwilcl/wilcl/species/thlizard/. If horned lizards are found on-site, TPWD recommends contacting this office to develop plans to relocate them, particularly if there is likelihood that they would be harmed by project activities. To minimize impacts to the Texas horned lizard, TPWD recommends the use of the BMPs described in the Texas Horned Lizard Watch - Management and Monitoring Packet which can be found online at http://www.tpwd.state. tx. us/publications/owdpubs/media/pwd bk w70000038.pdf and Texas Tortoise Best Management Practices which can be found online at http://www.tpwd.state.tx.us/huntwild/wilcl/wildlife diversity/habitat assessment/media/texas tortoise bmps.pdf. Please note that Texas tortoise BMPs are applicable to the Texas horned lizard.	As discussed in the Biological Evaluation, the Texas horned lizard is now much more common in the western two-thirds of the state than in central or eastern Texas. Because this species occurs scarcely in the region, it is considered highly doubtful that the species is present in the state-owned right-of-way. Consequently, the construction and use of SH 45SW is unlikely to cause adverse impacts to this species (see Appendix M in the Final EIS).

Organization	Verbatim Comment	Response
Texas Parks and Wildlife Department (TPWD) - Table 3.8-2 Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties	Table 3.8-2 in the DEIS lists Peck's cave amphipod (Stygobromus pecki) as federally endangered in Travis and/or Hays County. Please note that this species is believed to occur in Comal County, but not in Travis or Hays counties. Table 3.8-2 in the DEIS does not include a federal listing designation for the Texas fatmucket (Lampsilis bracteata), Smooth pimpleback (Quadrula houstonensis), Texas pimpleback (Quadrula petrina), Golden orb (Quadrula aurea), or the Texas fawnsfoot (Truncilla macrodon). Please note that these species are designated as federal candidates for listing. Please also note that Sprague's Pipit (Anthus spragueii) is listed as a Species of Greatest Conservation Need in Table 3.8-3. This species is also designated as a federal candidate for listing. Recommendation: TPWD recommends revising Tables 3.8-2 and 3.8-3 accordingly to reflect the correct listing designations for the above-mentioned species.	These species are addressed in the Biological Evaluation that has been appended to the Final EIS (Appendix M).
Texas Parks and Wildlife Department (TPWD) - Water Resources - Edwards Aquifer	The study area is located within the Edwards Aquifer Recharge Zone. The recharge zone is a 1,250 square mile area where highly faulted and fractured Edwards limestones outcrop at the land surface, allowing large quantities of water to flow into the aquifer. In the recharge zone there are no other rock formations overlying the Edwards, so it is exposed at the surface. The aquifer here is "unconfined..and has a water table that rises and falls in response to rainfall. Within the recharge zone, the aquifer is fed both from streams and from direct infiltration through karst limestone openings. These openings may be visible at the surface or hidden beneath thin soil coverings. Because there is little opportunity to capture released pollutants, and because of the hidden location and orientation of the subsurface conduits, the aquifer is even more vulnerable to pollution from activities on the recharge zone. Recommendation: TPWD recommends TxDOT ensure that precipitation runoff, which could potentially carry pollutants, is intercepted and treated before reaching sensitive recharge features on and off the project site by installing storm water Best Management Practices (BMPs). TPWD recommends installing erosion and sediment control BMPs that would aide in construction stabilization. Erosion and sediment control measures include temporary or permanent seeding (with native plants), mulching, earth dikes, silt fences, sediment traps, and sediment	Stormwater (precipitation) runoff would be intercepted and treated before being released into receiving waters. Construction phase (erosion and sedimentation control) best management practices would be implemented and would be described in the Stormwater Pollution Prevention Plan and Water Pollution Abatement Plan. Post-construction total suspended solids removal best management practices would also be implemented, to include permeable friction course pavement, vegetative filter strips and water quality ponds/hazmat traps.

Organization	Verbatim Comment	Response
	basins. Examples of post-construction BMPs include vegetation systems (biofilters) such as grass filter strips and vegetated swales as well as retention basins capable of treating the additional runoff that would occur from the increase in impervious cover.	
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Water quality studies cited in the DEIS showed a connection between recharge and discharge at Barton Springs. Section 3.6.I (page 139) in the DEIS states "Despite the overall good water quality of Barton Springs, the presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water detected by researchers over the past few decades signify potential effects of growing regional urbanization on aquifer water quality." TPWD notes that rainfall does influence time within the aquifer and the quality of water discharged. Recommendation: TPWD recommends that special attention be paid to runoff into the recharge areas during the entire process of construction, including pre-construction, during construction, and post-construction.	The Final EIS has been updated to specify best management practices (best management practices) to protect sensitive features for all phases of the project. These best management practices include protective designation on the construction drawings, especially in the Storm Water Pollution Prevention Plan; installation of temporary barriers, i.e. fencing, drainage and sediment controls prior to commencement of construction; establishment of a construction free zone, i.e. natural buffer that would be in place during and after construction is complete. Additional information is provided in Appendix H (Water Quality and Aquatic Resource Technical Report) of the Final EIS and in Sections 3.6 of the Final EIS.
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Contaminants in karst systems are mobile and persistent and often difficult to detect. Point source contamination (such as spills) and non-point source contamination present different concerns. Non-point source contamination, such as runoff from roadways, is perhaps the most difficult to ameliorate. In addition, there will likely be an increase in nutrients associated with new development that occurs along the newly constructed roadway. TPWD has concerns regarding the potential cumulative impacts that will likely further impact aquifer water quality and in tum threaten highly sensitive karst ecosystems including those associated with Barton Springs. Point source contamination is likely to travel towards a spring in the form of a relatively narrow plume. Detecting such a plume is difficult without continuous monitoring, making it very difficult to ameliorate the effects of such a plume before the spring habitat is affected. Although a Water Pollution Abatement Plan (WPAP) will be submitted, technical details are not included in the DEIS. Section 3.6.2 (page 161) in the DEIS states that the use of BMPs in series will remove 90 percent of pollutants over the Recharge Zone and the remaining 10 percent would be diluted by the Edwards Aquifer. While TPWD supports the use of BMPs as described in the DEIS, a detailed Water WPAP including a final design and description of features, as well as how the features	The Water Pollution Abatement Plan, which includes the geologic assessment, will be available for review by any person once it is published, which will take place after the environmental review process.

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	will be maintained in the future, is needed. Recommendation: TPWD requests that TxDOT provide the WPAP to this office for review. Furthermore, a completed Geologic Assessment, a key component to addressing concerns within karst regions, is needed to properly assess the potential impacts of the project.	
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Section 3.3.2 (page 104) in the DEIS states that the effects of the proposed project, including construction activities, would directly impact the openings of seven karst features. Four of these are described as potentially sensitive. The DEIS states that berming and/or backfilling to permanently seal the features is recommended to prevent impacts to water quality. Flint Ridge Cave is a significant recharge feature that has its surface opening located approximately 150 feet outside of the state-owned ROW and that a portion of the drainage area of the cave is within the state-owned ROW. Page 159 in the DEIS states that encroachment of impervious roadway cover on the drainage basin could result in a "decrease in water volume, resulting in potential drying of the cave environment and impacts to troglobites or aquifer-dependent species, as well as in a loss of recharge to the underlying Edwards Aquifer." Comment: While these may be effective methods for guarding against contamination of the aquifer, TPWD has concerns that steps to protect water quality may negatively impact karst ecosystems within the features.	The roadway alignment has been adjusted to minimize impacts to Flint Ridge Cave and other sensitive karst features. Current designs show that the roadway can be constructed almost entirely outside of the Flint Ridge Cave surface drainage basin. Current schematics for the roadway indicate that approximately 0.71 acre of the drainage basin will be covered by the roadway. The Final EIS includes a discussion of the roadway adjustments as well efforts conducted to minimize impacts to Flint Ridge Cave (Section 3.3). The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M). The conclusion of the investigations is that the ecological integrity of Flint Ridge Cave will not be impacted by the project.

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Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	The following recommendations discuss information provided in Section 3.6.2 of the DEIS. Page 140 states that within the state-owned ROW, approximately 277.4 acres lie over the Recharge Zone and 31.7 acres lie over the Transition Zone. Overall, the analyses indicate that the proposed project would have a negligible impact to recharge or spring flows because the increase in impervious cover is minor (47.9 acres over the Recharge Zone), and the proposed project would include BMPs that would collect and treat runoff prior to discharging it off-site. Recommendation: It is unclear to TPW why 47.9 acres of impervious cover over the Recharge Zone would be considered minor in an area that is approximately 277.4 acres. TPWD recommends TxDOT further explain in the FEIS the basis for this statement.	Construction of SH 45SW would result in the introduction of approximately 52.44 acres of impervious cover to the Recharge Zone for the Barton Springs segment of the Edwards Aquifer. The Recharge Zone for the Barton Springs segment covers approximately 98 square miles. The loss of 52.44 acres of the Recharge Zone to construction of SH 45SW thus represents an approximately 0.08 percent decrease in the amount of land within the Recharge Zone available to allow water to percolate through the ground and provide recharge to the aquifer. Additionally, while the surface drainage basins of two sensitive features (F-55 and F-23 [Hat Sink]) in the state-owned right-of-way and Flint Ridge Cave would be directly impacted by the proposed project, compensating drainage areas outside the original surface drainage basins would be used to divert flow to these sensitive features so that the amount of water flowing to these features would be maintained; therefore, no loss of recharge is anticipated at these sensitive karst features. Also, the stormwater runoff from the proposed roadway would be released (following treatment) and would be able to recharge the aquifer. Finally, it is expected that very little water reaches the aquifer via direct percolation through the ground within the state-owned right-of-way owing to the comparatively thick covering of clayey terra rossa soils. More information is available in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; Karst Terrain Features Survey and Evaluations for the State Highway 45 Southwest Right of Way from State Loop 1 (MoPac) to Farm-to-Market 1626, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report.
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Page 141 states that an Environmental Compliance Management Plan (ECMP) would be developed with water quality-specific guidelines and trained personnel to ensure its success. Recommendation: TPWD respectfully requests that TxDOT send the above mentioned ECMP to this office for review and comment once a draft has been prepared.	The request will be included in the Environmental Permits, Issues and Commitments sheet for the construction contractor and included in commitments portion of the Final EIS.
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Pages 152, 158, and 160 discuss the proposed water quality ponds to be constructed for this project. Water quality ponds would be used to capture runoff and remove Total Suspended Solids (TSS) and other pollutants. These ponds may include batch detention ponds, sedimentation ponds, or sand filter systems; the DEIS states that although the proposed project would add new impervious cover over the Recharge Zone, as proposed, stormwater generated from the road would be treated through water quality ponds and then released over time (after any single event, the water would be retained for a minimum of 12 hours and released over a 48-hour period) to recharge back into the aquifer. Recommendation: The long term maintenance plans for the abovementioned proposed water quality ponds were not	The long term maintenance plans for specific permanent water quality controls will be prepared for and included in the Water Pollution Abatement Plan and the Environmental Compliance Management Plan. The guidelines are available from the Texas Commission on Environmental Quality RG-348 publication and addendum posted on the agency's website.

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	discussed in the DEIS. TPWD recommends including these plans in one or both of the supporting environmental documents being prepared for this project (WPAP or the ECMP).	
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Page 152 states that water would be released from ponds in a slow release such that velocity would be controlled. In this way, stormwater runoff velocities would be reduced prior to release to receiving waters, therefore reducing streambank erosion along receiving waters. Comment: TPWD notes that slow release of water from water quality ponds is also important to reduce erosion at the discharge site, in addition to reducing streambank erosion along receiving waters.	Comment noted. This particular benefit of flow moderation has been explicitly added to the Final Environmental Impact Statement in Section 3.6.2.
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Page 152 states that water quality ponds would also function as hazardous materials traps and contain potential hazardous materials in the event of a spill. Recommendation: TPWD recommends designing the water quality ponds with the ability to shut off the discharge into the creeks in the event that hazardous materials enter the ponds. TPWD recommends including this information in one or both of the supporting environmental documents being prepared for this project (WPAP or the ECMP).	The water quality ponds and hazardous materials traps have not been designed at this time. TxDOT will consider all prudent design elements including the best way to completely contain potential discharges of hazardous materials.
Texas Parks and Wildlife Department (TPWD) - Water Resources and associated karst ecosystems	Section 3.8.2 (page 244) in the DEIS states that Bear Creek is the only water body indicated on published maps as being perennial in the proposed project area (though it has been observed to be intermittent with perennial pools). Recommendation: TPWD notes that the above-mentioned statement contradicts other sections of the DEIS that state Bear Creek is intermittent. Texas Commission on Environmental Quality describes the creek as intermittent with perennial pools. TPWD recommends TxDOT revise the document for consistency in describing Bear Creek.	The Final EIS has been updated to clarify that Bear Creek is identified as a perennial stream by the National Hydrography Dataset, but was observed to be intermittent in the study area.
Travis County - environmentally sensitive design and implementation	Travis County and the Central Texas Mobility Authority (CTRMA) have emphasized that the project will employ the best and most environmentally sensitive design and implementation. To support this, the design for the project should include a clearer exposition of and commitment to an elevated level of environmental management. The Environmental Commissioning process used by the City of Austin in its Water Treatment Plant 4 project serves as an example that may be followed.	Comment noted.

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Travis County - ES.5 Build Alternative Geology & Soils	The second sentence states that "... erosion would be minimized by using proper techniques and best management practices during construction." COMMENT: The project will be constructed with extra attention given to protecting the environment. We suggest stating that BMPs that exceed the industry standard for development will be used. Can standard BMPs be compared against the higher standard BMPs that will be used here or in the main document?	Extensive data were compiled regarding the performance of various best management practices as part of the selection process. The comparison was determined to be lengthy and cumbersome and was therefore presented in Appendix H.
Travis County (p. 2-3) - BMPs and ECMP	The DEIS describes an extensive collection of BMPs that are intended to provide for protection of surface and groundwater resources and provides for an Environmental Compliance Management Plan (ECMP) with an on-site compliance manager. The BMPs and ECMP in the DEIS are not yet organized into a clear, coherent strategy. The essential features of the proposed environmental protections and the implementation procedures should be more fully and cohesively elaborated in the FEIS. The framework for how these protections and procedures will be implemented in design, construction, and operations should be described with specific clarification and commitment that specific details will be fully and comprehensively addressed at each stage of project development, i.e. design, construction and operations.	Detailed schematic design of the best management practices that would be utilized both during and after construction is fully discussed in the Final EIS (Appendix H). An outline of the Environmental Compliance Management Plan is also discussed in the Final EIS (Appendix H).
Travis County (p. 4) - ES.5 Build Alternative Land Use	The seventh sentence states the lack of frontage roads and the limited number of access points constrain opportunities for potential development immediately adjacent to the roadway. COMMENT: Could tolls be added as a factor? Will development adjacent to the road between FM1626 and Bliss Spillar be constrained or precluded? We suggest using the word "preclude" instead of the word "constrain." We suggest revising the last sentence to read "The proposed project's influence on development is not anticipated to be significant, especially given the Austin area's high rate of growth overall and the transportation improvements such as the widening of FM1626 already occurring in the study area." Could it be said that full control of access, as is proposed between Loop 1 and FM1626, will result in less impact than partially controlled access as has been experienced adjacent to the segment between FM1826 and Loop 1?	The seventh sentence in the paragraph will remain as written; development is only precluded on Water Quality Protection Lands, protected from development by the city of Austin. On privately owned land between FM 1626 and Bliss Spillar, development could not be precluded by TxDOT; however, as stated in the Final EIS, development induced by the project would be constrained by the limited number of access points and the lack of frontage roads, which both limit the adjacent properties' access to the roadway.
Travis County - ES.3	We suggest including "improved safety" in the first sentence, as a project purpose.	Although safety would likely be an added benefit of the proposed build alternative, the purpose of the proposed action is to improve system connectivity, local mobility, and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis Counties. Please refer to Section 1.0 for the Purpose and Need of the proposed project

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Travis County - ES.4 Preferred Alternative	Preferred Alternative, states that the Build Alternative was identified as it excludes frontage roads throughout the project's length. COMMENT: Are there any other aspects of the short segment between Bliss Spillar and FM 1626 not identical to the long segment between Bliss Spillar and Loop 1? If so, they should be pointed out. The Shared Use Path is shown to have its own alignment. Could the alignment be established closer to the road (especially at the bridge crossing) to help minimize disturbance of the land?	The revised schematic in the Final EIS reflects differences between the segments east and west of Bliss Spillar. The revised schematic shows the Shared Use Path closer to the proposed roadway through much of the corridor to avoid and minimize impacts to sensitive karst features. The Shared Use Path now crosses Bear Creek as part of the roadway bridge structure and is shown in Appendix C of the Final EIS.
Travis County - ES.5 Build Alternative Air Quality	The second sentence states, "The VMT in the study area estimated for the build alternative is slightly higher than for the no build alternative because the proposed roadway would increase access, attracting trips that would not otherwise occur in the area." Can it be changed to read "... because the proposed roadway would improve travel time, attracting trips ...."	Although this is a state-level, and not federal-level, Environmental Impact Statement, the language used in this instance was based on Federal Highway Administration recommendation and subsequently in TxDOT guidance. Added "and improve travel times" to this sentence.
Travis County - ES.5 Build Alternative Socioeconomic Resources	The third sentence in the first paragraph lists reasons why the area transportation network would improve if the proposed roadway is built. COMMENT: Can "improved safety" be added? The last sentence in the first paragraph states that the proposed project may also connect to a trail system and bike-accessible shoulders on FM1626. Do the trail and bike-accessible shoulders currently exist? We suggest adding that the proposed project offers some protection from wildfires by providing a wide fire break, providing access to the area for fire fighters and access for wildfire risk-reduction projects. Could it be added that the project will improve emergency response times in this area?	Although safety would likely be an added benefit of the proposed build alternative, the purpose of the proposed action is to improve system connectivity, local mobility, and travel times, while providing an efficient alternative route to congested local roadways in northern Hays and southern Travis Counties. Please refer to Section 1.0 for the Purpose and Need of the proposed project. The Violet Crown Trail is being planned by City of Austin and Hill Country Conservancy (the trail is described as "proposed" in the Draft EIS); FM 1626 is currently under construction (including bike-accessible shoulders). Section 3.2 of the Final EIS has been updated to incorporate the project's benefits to emergency response in the area.
Travis County - ES.5 Build Alternative Water Quality	The fourth sentence states, "Impacts would be minimized by the use of robust BMPs during roadway construction and operation." COMMENT: We suggest including a side-by-side comparison of the BMPs used for development and the BMPs that will be used for this project?	Extensive data were compiled regarding the performance of various best management practices as part of the selection process. The comparison was determined to be lengthy and cumbersome and was therefore presented in Appendix H.
Travis County - ES.5 Build Alternative Water Quality	What level of storm event will the project BMPs be designed to capture and treat? The last sentence in the last paragraph lists the regulations that are in place to protect water quality from the effects of induced development. These include Texas Commission on Environmental Quality regulations requiring BMPs and preparation of SW3Ps, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the Clean Water Act.	The Final EIS has been updated to clarify that the 2-year 24-hour storms are used for construction phase controls (Appendix H). The runoff depth for water quality ponds would depend on the percent runoff that can be captured and the target removal efficiency. Comment noted regarding regulations in place to protect water quality from effects of induced development.

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Travis County - ES.5 Build Alternative Water Quality	The County is an MS4 operator. Should its SWMP be included on this list?	This section of the Executive Summary has been updated to include the SWMP. A discussion of Travis County's regulatory authority is included in Section 3.1.
Travis County - ES.5 Build Alternative Waters of the US and Wetlands:	Does this section need to be revised to include the proposed rule change currently under review by USEPA and USDOD? Is this issue moot since the DEIS states that no 404 permit will be required?	The proposed rule change referenced by Travis County would revise the definition of "waters of the U.S." and could result in modified wetland boundaries. However, the rule change has not been finalized at the time of the Final EIS, and the regulatory program has not been proposed to change. No changes in the Draft EIS conclusions would likely result from these future changes.
Travis County - Executive Summary (ES) general	DEIS doesn't mention Travis County as a regulatory authority in the area such as our MS4 designation; our roadway operation and maintenance responsibilities for non-State/CTRMA roads affected by the project (Bliss Spillar); and our water quality protection rules.	Comment noted. Final EIS has been updated to reflect these regulatory responsibilities in Section 3.1.
Travis County - FRC, BCCP	The protections described in the DEIS suggest that they provide superior protection for Flint Ridge Cave. The Balcones Canyonlands Conservation Plan (BCCP), a federal Endangered Species Act Section lOA permit held by Travis County and the City of Austin, requires this cave to be protected. The lnterlocal Cooperation Agreement between Travis County and CTRMA requires consultation with the U.S. Fish & Wildlife Service (USFWS) to determine what, if anything, is necessary to avoid Travis County's violating the BCCP permit. To achieve this, environmental management via best management practices (BMPs) for design, construction and operations may need to be carried out in a manner even more protective of Flint Ridge Cave than is described in the DEIS. The purpose of the EIS to fully describe the project's environmental impacts and consequences. Accordingly, it needs to address all BCCP issues. The consultation process with USFWS described in the interlocal agreement between CTRMA and Travis County will be important in addressing this issue.	Based on detailed karst feature surveys, the proposed schematic has been revised and is presented in the Final EIS. Protections to Flint Ridge Cave have been increased and impacts to the surface drainage basin to the cave have been minimized. Best management practices to protect Flint Ridge Cave are discussed in further detail in the Water Quality and Aquatic Resource Protection Technical Report (Appendix H) and the Biological Evaluation (Appendix M). Participation in the Balcones Canyonlands Conservation Plan is under the purview of the permit holders. It is TxDOT's understanding that Travis County is currently coordinating with the U.S. Fish and Wildlife Service to determine if the ecological integrity of Flint Ridge Cave would be maintained. Please refer to the Final Draft: Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas technical report in Appendix M.
Travis County - NO BUILD ALTERNATIVE Air Quality	It appears that there will be no difference in the no-build or build alternatives.	Comment noted. Emissions will likely be lower than present levels in the design year as a result of US Environmental Protection Agency's national control programs that are projected to reduce annual Mobile Source Air Toxins emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, vehicle miles traveled growth rates, and local control measures. However, the magnitude of the US Environmental Protection Agency-projected reductions is so great (even after accounting for vehicle miles traveled growth) that Mobile Source Air Toxins emissions in the study area are likely to be lower in the future in virtually all locations.
Travis County - NO BUILD ALTERNATIVE Noise	No build results in more congestion and neighborhood cut-through traffic which brings more road noise.	Comment noted.

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Travis County - NO BUILD ALTERNATIVE Socioeconomic Resources	It appears that there will be no difference in the no-build or build alternatives.	The No Build Alternative text has been revised to clarify that under the No Build Alternative, travel times on existing area roadways is expected to increase by an average of nearly 45 percent. Refer to Section 1.4 for discussion of travel times under the No Build Alternative and 3.2.2 for discussion of socioeconomic effects.
Travis County - NO BUILD ALTERNATIVE Threatened and Endangered Species	It appears that there are no endangered or threatened species or habitat so there will be no difference in the build or no-build alternatives	Possible impacts of the project on threatened or endangered wildlife and their habitats including surface and sub-surface water and habitat as well as state-listed and non-listed wildlife resources have been evaluated and presented in the technical reports: SH 45SW Biological Evaluation; Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas; State Highway 45SW: Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas.
Travis County - NO BUILD ALTERNATIVE Waters of the US and Wetlands	There are no wetlands on the project so will there be no difference in the build or no-build alternatives	There is no difference in impacts to wetlands and waters of the U.S. between the build and no-build alternatives.
Travis County - Page ES-12, Waters of the US & Wetlands	Isn't a 404 permit required if any work is performed within the 100 year floodway? Will any of the bridge structure be within the flood way? Even if it is covered by a nationwide permit it should be stated here.	Impacts to wetlands or other waters of the U.S. require 404 permits. No wetlands were found in the limits of construction and impacts to streams would be avoided by ensuring that bridge support structures would not result in fill material being placed below any stream's Ordinary High Water Mark. The proposed construction over waters of the U.S. would not require a 404 permit. See p 312 of the Draft EIS.
Travis County - Page ES-9, Air Quality	There is no discussion regarding the emission emitted from idling vehicles as it relates to the build alternative. The reduction in delays will reduce the idling vehicles. In turn the emissions from these vehicles will be reduced by reduction in travel times.	Although it is true that a decrease in congestion and idling vehicles may result in a reduction of certain air emissions, an increase in vehicle capacity can potentially offset this. In regards to potentially significant localized vehicle emissions associated with idling vehicles: carbon monoxide, PM, and Mobile Source Air Toxins may be analyzed. The project is located in area in attainment or unclassifiable for all National Ambient Air Quality Standards, therefore US Environmental Protection Agency does require a hot-spot analysis for carbon monoxide or PM. In accordance with a study performed by TxDOT to identify the worst-case carbon monoxide emissions from various traffic volumes, the vehicle volumes associated with this project do not warrant a separate carbon monoxide Traffic Air Quality Analysis either. In regards to Mobile Source Air Toxins, the qualitative Mobile Source Air Toxins analysis identifies that Mobile Source Air Toxins emissions generally track with vehicle miles traveled changes but that Mobile Source Air Toxins emissions may be further reduced due to congestion reduction; however, the magnitude of the US Environmental Protection Agency-projected reductions is so great (even after accounting for vehicle miles traveled growth) that Mobile Source Air Toxins emissions in the study area are likely to be lower in the future regardless of the alternative chosen.

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Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.1 Land Use, Proposed Land Uses.	This section does not account for joint jurisdiction of City and County for environmental review and development permits.	This discussion has been updated in the Final EIS to reflect more accurately city of Austin and Travis County jurisdiction in Section 3.1.1 Land Use: Proposed Land Use.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	The project area is acknowledged to be a highly sensitive environment. The DEIS proposes and Environmental Compliance Management Plan (ECMP) with specific guidelines and an on-site compliance manager. This is appropriate for any large scale or significant project when environmental issues are important. However, the ECMP as presented does not appear adequate to address the heightened environmental concerns of this project or to rise to the level of intensive scrutiny promised by CTRMA and TxDOT.	Details of the Environmental Compliance Management Plan would be further developed in the Plan Specifications & Estimate phase of the project, including best management practices that will be used during and after construction.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	On page 311 of the DEIS, the placement of water quality ponds as construction phase sediment basins is identified to occur "as soon as practical". It is strongly recommended that placement of all construction BMPs occur prior to disturbance of every drainage area prior to each particular phase of the project.	Final construction of permanent best management practices would take place as soon as practical. For example, stabilization of vegetated filter strips and swales that treat stormwater runoff would be implemented when grading is completed in particular portions of the project. Water quality ponds would be excavated prior to the commencement of construction and serve as temporary sediment ponds. Plans for these best management practices are discussed further in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Water Quality and Aquatic Resource Protection Technical Report. Both of these reports are included in the Final Environmental Impact Statement.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	Project representatives indicated on July 25, 2014, that at least 19 karst features near or within the project right-of-way remain under investigation and delineation. It appears that some locations may affect design of the project in a substantial way, such as Jubilee. Additional efforts are ongoing to ascertain the subsurface drainage area of Flint Ridge Cave. Further assessment of potential impacts, roadway design, alignment alternatives, and appropriate construction/post-construction storm water control measures must be undertaken after the remaining data and information become available, considering the potential impacts of the project on surface and groundwater quality.	The karst feature survey has since been completed and all sensitive karst features have been identified. All aspects of the roadway design were modified to prevent and/or limit as much as possible the impacts on sensitive karst features. With the use of a sub-surface map and a thorough delineation of the surface drainage area for Flint Ridge Cave, protective buffers will be put in place during construction to substantially limit the potential impacts on Flint Ridge Cave and any other sensitive karst features identified in the survey. Extensive erosion and sediment control measures will be utilized during and after construction to prevent any sediment-laden runoff from entering all known sensitive karst features, especially Flint Ridge Cave. TxDOT is aware of the city of Austin study of the subsurface drainage area of Flint Ridge Cave. Given the drought conditions of the past several years and the forecast for the drought to continue it is unlikely that the study will be complete in time to be considered in the design of the roadway. The design team continues to compile relevant scientific studies to better inform the design process. Should studies become available, they would be given the appropriate consideration.

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Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	The ECMP as presented is very preliminary and conceptual. Numerous Best Management Practices are referenced but are described in concept rather than in specific detail and linked to specific design features. One way to address this is by strengthening the Environmental Management Plan to encompass the Environmental Commissioning concept.	Details of the Environmental Compliance Management Plan would be further developed in the Plan Specifications & Estimate phase of the project, including best management practices that will be used during and after construction.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	During working group sessions, COA staff described a more intensive approach described as Environmental Commissioning. We urge CTRMA and TxDOT to expand their approach to environmental management to include environmental commissioning. This is especially important to ensure against degradation of Flint Ridge Cave. The EC lead must be empowered to direct, alter or stop work with the primary goal of ensuring protection of FRC.	The recommendations in the comment are consistent with the approach used to develop the Environmental Compliance Management Plan as it is presented in the Draft EIS. The Environmental Compliance Management Plan is further discussed in the Final EIS. Details of the Environmental Compliance Management Plan will be further developed in the Plan Specifications & Estimate phase of the project, including best management practices that will be used during and after construction.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	Many of the proposed protection measures are indefinite and conditional. For example: "phased construction would be considered" (p. 151). References like these should be made more definite.	The language used here is appropriate for this stage of project assessment. The design team continues to compile relevant scientific studies to better inform the design process. Should studies become available, they would be given the appropriate consideration.
Travis County - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	A number of BMPs are detailed in the appendices even though they have been rejected elsewhere in the DEIS. Please clarify.	Appendix H is intended as a broad review of water quality issues and available mitigation approaches. The items identified in the Draft EIS represent proposed mitigation approaches based on site conditions and information presented in Appendix H.
Travis County - standard of care for karst area projects	Through consultation with TxDOT, we are advised that TxDOT has a record of success with roadway projects passing over and near sensitive karst features like Flint Ridge Cave that are, like other BCCP karst features, subject to USFWS jurisdiction. TxDOT has established a "standard of care" in their projects that has provided adequate protection as determined by USFWS. This "standard of care" should be fully elaborated in the FEIS. It should be explained, documented and linked to design, construction and operations of the current project.	Details of the Environmental Compliance Management Plan would be further developed in the Plan Specifications & Estimate phase of the project, including best management practices that will be used during and after construction.

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Travis County - subsurface drainage study	To the County's knowledge, USFWS has never required a subsurface drainage study for a road project potentially affecting a BCCP cave. However, the City of Austin is currently conducting such a study for Flint Ridge Cave. The risk that the study will result in major project redesign appears extremely low. However, because the project sponsors are committed to the highest levels of environmental protection, final project design should remain contingent on the final result of the study. The FEIS should reflect that the final design and construction of the project will be adjusted as appropriate to reflect any relevant findings from that study.	The design team continues to compile relevant scientific studies to better inform the design process. Should studies become available, they would be given the appropriate consideration. TxDOT is aware of the city of Austin study of the subsurface drainage area of Flint Ridge Cave. Given the drought conditions of the past several years and the forecast for the drought to continue it is unlikely that the study will be complete in time to be considered in the design of the roadway.
Travis County (p. 5) - ES.5 Build Alternative Noise	The analysis indicated there will be four affected residences but it would not be cost effective to install noise barriers. COMMENT: Did the analysis consider noise coming from the top of the bridges that will be built at Bliss Spillar and will the elevated noise source make a difference in the decision not to include noise abatement?	The noise model did include the proposed structures at the SH 45 SW/Bliss Spillar interchange. The impacted receivers were not located in the vicinity of the Bliss Spillar interchange and noise barriers were not found to be reasonable or feasible per TxDOT guidance (Section 3.5 of the Final EIS).
Travis County (p. 6) - ES.5 Build Alternative Hazardous Materials	Is it intended to prohibit post-construction truck traffic from using this road?	No class of traffic, other than permitted hazardous material loads, would be excluded from this road segment.
Travis County (p. 7) - Section 3.0 Affected Environment & Environmental Consequences; 3.1 Land Use, Local Plans and Policies.	The discussion of City of Austin & Travis Country jurisdiction is not complete or clear. Within the Austin ETJ, the City and County have joint jurisdiction for many projects • Subdivisions are subject to joint City-County review under the Chapter 30 Single Office. • Non-subdivision development is subject to separate development permits by City & County. • In unincorporated areas both the County and the City of Austin have authority as permitted Municipal Separate Storm Sewer Systems (MS4s).	Discussion updated to include these statements (Section 3.1.1 City of Austin).
Travis County (p. 8) - Section 3.0 Affected Environment & Environmental Consequences; 3.6 Edwards Aquifer/Groundwater Resources.	Much of the discussion of BMPs suggests that the BMPs will be used to meet Texas Commission on Environmental Quality standards. We strongly urge the DEIS be revised to emphasize that these standards will be the minimum requirement for performance. This is consistent with the plan stated goal of achieving better than minimum compliance standards. Higher level environmental protection is specified at various times in the DEIS, but should be specifically and consistently addressed where Texas Commission on Environmental Quality standards are referenced.	As shown in the Draft EIS, through a continued effort to do so, Texas Commission on Environmental Quality standards have been exceeded. There are no plans to back away from this goal. However, the framework of regulatory commitments applies to this project and the design team is bound to those commitments. The best management practices for the project would exceed Texas Commission on Environmental Quality requirements for permanent best management practices. As stated in the Draft EIS, at least 90 percent of the annual load of total suspended solids would be removed on the Recharge Zone. Although there is no Texas Commission on Environmental Quality performance standard for temporary best management practices, the project would utilize a variety of best management practices to achieve better than minimum compliance standards.

Organization	Verbatim Comment	Response
Travis County Transportation and Natural Resources (Travis County) (p. 2) - ILA	The Travis County Commissioners Court approved support of the SH 45 SW project by a resolution of October 22, 2013, and by approval of an Interlocal Cooperation Agreement to construct the project between Hays County, Travis County, and the Central Texas Regional Mobility Authority on March 18, 2014.	Comment noted.
USFWS - action area definition	One of the difficulties in interpreting the effects to the GCW, as well as other environmental factors, are the multitude of differing special scales used in the dEIS evaluation. The dEIS does a poor job defining the action area of the proposed project and relating the environmental effects analysis to the action area. Instead, TxDOT uses ROW, study area, resource study area, project corridor, and area of influence in various analyses in the dEIS, often for the same resource, including the GCW. The action area is normally defined as the area where direct and indirect project related effects would occur. The Service believes the action area should be specifically defined in the dEIS and used consistently in the effect analysis throughout the document.	The scale areas investigated are in compliance with TxDOT and pertinent agency guidance. The intent of the varying scales is to provide a relevant area for the analysis of the resource/land use being investigated. The definition of scales used throughout the document will be revised to provide a better explanation of the areas being analyzed and include justification for the boundaries.
USFWS - alignment	No discussion about TxDOT's ability to modify the proposed alignment within the existing ROW in order to avoid or minimize effects to the GCW, karst habitat, Flint Ridge Cave, or other resources.	The roadway alignment has been adjusted to minimize impacts to Flint Ridge Cave. Current designs show that the roadway can be constructed almost entirely outside of the Flint Ridge Cave surface drainage basin. Current schematics for the roadway indicate that approximately 0.71 acre of the drainage basin would be covered by the roadway. The Final EIS includes a discussion of the roadway adjustments as well efforts conducted to minimize impacts to Flint Ridge Cave (Section 3.3). The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M). The conclusion of the investigations is that the ecological integrity of Flint Ridge Cave will not be impacted by the project.

Organization	Verbatim Comment	Response
USFWS - alternatives	The Service has issues with the dEIS related to the evaluation of reasonable alternatives and a lack of sufficient information to be able to verify TxDOT's conclusions on potential effects.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - Austin Blind salamander	There are several issues in the dEIS related to Service trust resources that we believe must be examined in greater detail. Some of the issues are project related effects to listed species…[such as the] Austin Blind salamander (*Euyacea waterlooensis*)	The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M).
USFWS - Barton Springs salamander	There are several issues in the dEIS related to Service trust resources that we believe must be examined in greater detail. Some of the issues are project related effects to listed species…[such as the] Barton Springs salamander (*Euyacea sosorum*)	The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M).

Organization	Verbatim Comment	Response
USFWS - BMPs and FRC	The implementation of water quality BMPs does not guarantee that adverse effects to water quality would be avoided and TxDOT admits in the dEIS that some level of pollutants would remain after water quality treatment. Occasional severe storm events could result in failure of BMPs as the storage capacity of temporary controls are overwhelmed and result in a significant amount of pollutants entering the aquifer, either through karst features within or adjacent to the ROW, such as Flint Ridge Cave, or through Bear Creek.	The roadway project as designed would exceed the minimum standard of the Edwards Aquifer Rules of removing at least 80 percent of the incremental increase in total suspended solids. At least 90 percent of the incremental increase in total suspended solids would be removed from the Recharge Zone. Permanent stormwater control measures would be used in combination to achieve more than 90 percent total efficiency. A combination of measures, when implemented as a whole, would provide water quality protection to sensitive karst features occurring in proximity to the SH 45SW right-of-way and to the Edwards Aquifer. TxDOT also believes that redundant controls would be sufficient to protect recharge features even during extreme rainfall events when untreated stormwater may bypass first-line best management practices.
USFWS - BMPs and FRC	Complete elimination of water quality impacts would require the retention of all runoff from the site, during construction, and roadway, once the project is completed. Water quality monitoring is needed pre-construction to establish baseline conditions, then during and post construction, in Bear Creek, Flint Ridge Cave and other recharge location, to evaluate and monitor effects of the project.	Retention of all site runoff is infeasible. All ponded water quality controls incorporate a bypass mechanism or emergency spillway to safely pass overflows. Water quality monitoring is not required to establish preconstruction or post construction pollutant values. These values are known from local studies of stormwater runoff. Proper construction, as well as ongoing inspection and maintenance of water quality controls will ensure their beneficial effect on surrounding recharge features. Page 6, 1st paragraph continued: Temporary stormwater control measures such as silt fence and rock filter dams would be sized based on standard TxDOT criteria. The use of these measures is restricted by drainage area and their ability to pass flow. They are sized for the 2-year 24-hour storm event (about 3.4 inches). Detention-type temporary stormwater control measures will meet the criteria for Optional Enhanced Measures for construction controls. Detention-type permanent stormwater control measures will be constructed to capture approximately 4 inches of rainfall. This amount is equivalent to capturing and treating 100 percent of the annual runoff in an average year. Complete detention of all site runoff is infeasible. All detention-type permanent stormwater controls would incorporate a bypass mechanism or emergency spillway to safely pass overflows. Regarding water quality monitoring: Baseline water quality monitoring is not required to establish preconstruction or post construction pollutant concentration values. Concentrations of various constituents in highway runoff, both untreated and treated by permanent stormwater control measures, are known from local studies. The performance of various measures are adequately understood. A combination of best management practices and measures, when implemented as a whole, would provide water quality protection to sensitive karst features occurring in proximity to the SH 45SW right-of-way and to the Edwards Aquifer.

Organization	Verbatim Comment	Response
USFWS - Consent Decree	Lastly there is no mention in the dEIS of the requirements of the 1990 Consent Decree reached in settlement of the lawsuit on the original SH 45 project. Without describing the requirements of the Consent Decree, the Service is not able to determine whether TxDOT is complying with the project and consultation requirements in the Consent Decree.	SH 45SW has been planned, and will be designed and constructed, to be more protective of water quality (specifically the Edwards Aquifer and Barton Springs) than what is required under the 1990 Consent Decree. For example, SH 45SW will incorporate modern best management practices, such as permeable friction course pavement and vegetated filter strips, to remove total suspended solids in stormwater runoff at a target rate of 90 percent removal. TxDOT has been in communication with the Barton Springs/Edwards Aquifer Conservation District at various stages of development of the Environmental Impact Statement, and Barton Springs/Edwards Aquifer Conservation District has participated in the SH 45SW technical workgroup. TxDOT intends to continue to work with the Barton Springs/Edwards Aquifer Conservation District, even after the Environmental Impact Statement is complete, to ensure that SH 45SW is fully protective of water quality in the Edwards Aquifer and Barton Springs.
USFWS - cooperating agency status	The dEIS states that the Service is a participating agency in the preparation of the dEIS and includes a copy of the Service's letter acknowledging that we would be a cooperating agency on the EIS development. Our agreement to be a cooperating agency was based on the (erroneous) assumption that the EIS would be a Federal document, based on the NEPA requirements and implementing regulations. Because it is not, and there are no mention of cooperating or participating Agency status in the Texas Administrative Code related to the development of a state EIS, this information should be removed from the EIS.	Comment noted. U.S. Fish and Wildlife Service was afforded an invitation to be a participant in the environmental review process associated with the preparation of the Environmental Impact Statement for the SH 45 SW project per 43 Texas Administrative Code §2.84. Based on the response in the US Fish and Wildlife Service correspondence letter dated July 23, 2013, the U.S. Fish and Wildlife Service was afforded participating agency status as defined in the coordination plan. Because of U.S. Fish and Wildlife Service participation in the Environmental Impact Statement review and two agency scoping meetings, the document reflects the U.S. Fish and Wildlife Service's participation in the environmental review process. Please refer to Section 7.0, Comments and Coordination and Appendix K for documentation of participating agency coordination and participation.
USFWS - effects analysis	Instead of evaluating the projects effects on listed species, TxDOT has made determinations on whether the preferred alternative would result in "take" of listed species, based on limited supporting data and analysis. Again, the requirement detailed in the Texas Administrative Code require an evaluation of the environmental impacts of the project, including direct, indirect, and cumulative effects. The Texas Administrative Code does not limit the evaluation to "take" of federally protected species. The evaluation in the dEIS should determine if the proposed project would affect listed species. If the effect to a listed rises to the level of harm (defined as: any act which kills off or injures federally protected species, including significant habit modification or degradation that significantly impairs their essential behavior	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of

Organization	Verbatim Comment	Response
	patterns and results in death or injury) or harass (defined as: the disruption of a listed species essential behavior patterns, including feeding, breeding, and sheltering), then TxDOT should consult with the Service under section 10 of the Act in order to avoid any potential section 9 "take" violation.	investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - effects analysis	The Service believes the current analysis of indirect and cumulative effects, located in Appendices D and I respectively, are insufficient. Indirect effects are those that are caused by the project but occur in a different location or later in time. Most of the dEIS discussion on water quality effects to the Edwards Aquifer, in Section 3.6, would be indirect effects. In addition, most of the discussion in Appendix I, covering cumulative impacts, relates to the direct or indirect effects of this project, instead of an evaluation of the past, present, and reasonably foreseeable future actions that may result in effects to the environment. We recommend the effects evaluation in the dEIS be redone to more accurately reflect potential direct, indirect and cumulative environmental effects and that all three types of effects be included in the Affected Environmental/Environmental Consequences section of the dEIS, rather than having the indirect and cumulative effects separated into appendices.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - Flint Ridge Cave (FRC)	The Service is also concerned about adverse effects to Flint Ridge Cave. (Comments below specifically address BMP, indirect impacts, pre-construction baseline, BCCP and incidental takes)	Comment noted.

Organization	Verbatim Comment	Response
USFWS - FRC and BCCP	The Service continues to be concerned that indirect impacts to Flint Ridge Cave would alter the biological conditions of the cave sufficiently to remove its conservation value as a BCCP mitigation feature in accordance with their Habitat Conservation Plan and section 10 Incidental Take Permit. TxDOT proposes to direct construction and road runoff, funneled by a 2,900 foot berm, into catchment basins for treatment, then release the treated runoff into Bear Creek. However, maintaining the water quality of Bear Creek is extremely important to the aquifer. Barrett et al (1985) estimate that approximately 85 percent of the recharge into the Barton Springs Segment of the Edwards Aquifer occurs in the beds of creeks that cross the recharge zone. TxDOT states that the amount of surface runoff entering Flint Ridge Cave would not be altered by the project. TxDOT proposes to replace an equivalent amount of surface runoff into Flint Ridge Cave as the amount that would be diverted into the detention BMPs. However, the specifics of how this would be accomplished, or what effect it would have on other karst features in the project area, were not addressed in the Draft-EIS.	A technical report, Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, has been completed and will be appended to the Final EIS. The conclusion of the report is that the ecological integrity of Flint Ridge Cave, including the quantity and quality of water entering the cave, will not be impacted by the project. A 105 meter radius around Flint Ridge Cave has been provided for cave cricket foraging.
USFWS - FRC and BMPs	TxDOT has not delineated, nor addressed impacts to the Flint Ridge Cave subsurface drainage basin. Recharge into Flint Ridge Cave has been measured to reach Barton Springs in as little as 2 days and recharge from Bear Creek can reach Barton Springs in 2 to 4 days. Construction of SH 45 SW would result in the conversion of about 5.6 acres, or about 13 percent, of the 43.8 acre Flint Ridge Cave surface drainage basin into impervious cover. It is unclear if that total includes only the road surface, or if it also includes the proposed berm, the area between the road and the berm where TxDOT proposes to install an impermeable bentonite clay layer to prevent infiltration and run off before it has been treated, or the area of the other treatment BMPs.	The roadway alignment has been adjusted to minimize impacts to Flint Ridge Cave. Current design show that the roadway can be constructed almost entirely outside of the Flint Ridge Cave surface drainage basin. Current schematics for the roadway indicate that approximately 0.71 acre of the drainage basin will be covered by the roadway. The Final EIS includes a discussion of the roadway adjustments as well efforts conducted to minimize impacts to Flint Ridge Cave. The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M). The conclusion of the investigations is that the ecological integrity of Flint Ridge Cave will not be impacted by the project.

Organization	Verbatim Comment	Response
USFWS - FRC, BCCP HCP & ITP	The Service is also concerned about adverse effects to Flint Ridge Cave, which could violate the requirements of the Balcones Canyonlands Conservation Preserve (BCCP) Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP).	No direct impacts to the opening of Flint Ridge Cave would occur as a result of the proposed project. TxDOT has adjusted the proposed alignment to minimize impacts to the Flint Ridge Cave surface drainage basin. The revised alignment would impact 0.7 acre of the surface drainage basin. Drainage to the cave would be maintained by re-routing an equivalent acreage of natural runoff into the cave's surface drainage area. TxDOT has evaluated the potential effect of construction and use of SH 45SW on the ecological integrity of Flint Ridge Cave. Based on site characteristics and proposed impacts avoidance and minimization measures, the ecological integrity of Flint Ridge Cave is likely to be maintained. Further information is provided in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - GCW	TxDOT states in Appendix I that there are 52 acres of GCW habitat in the ROW, but did not quantify how much of that 52 acres would be affected by the proposed project.	Appendix I (Cumulative Impacts Technical Report) of the Draft EIS cites a Texas A&M University study that modeled potential Golden-cheeked Warbler habitat. However, based on field investigations, no Golden-cheeked Warblers were detected in or adjacent to the state-owned right-of-way in the spring of 2014. The clearing of the SH 45SW right-of-way would not cause the direct loss of any woodland known to be used by Golden-cheeked Warblers. Additional information is available in the following reports: Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas; and Golden-cheeked Warbler Technical Report.
USFWS - GCW	TxDOT states that their GCW habitat assessment did not identify GCW habitat within the ROW, however in the dEIS (page 215) TxDOT describes the vegetation in the ROW as "generally composed of juniper-bluestem savannas and oak-juniper woodlands." Both of these habitat types can be used by GCW for feeding, breeding, and sheltering.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. The supportive details in this technical reports are incorporated into the Final EIS and summarized (in part) in the following SH 45SW Biological Evaluation (See Appendix M).
USFWS - GCW	USFWS' survey protocol for GCW states that if any area of the assessed property meets vegetative associations described in Campbell (2003), and a determination of non-GCW habitat was made, a report of the GCW habitat assessment must be provided to the Service for review within five days of the determination. This has not been done, and based on DEIS information USFWS would likely not have concurred with a negative GCW habitat finding.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. The supportive details in this technical reports are incorporated into the Final EIS and summarized (in part) in the following SH 45SW Biological Evaluation (See Appendix M).

Organization	Verbatim Comment	Response
USFWS - GCW	The Service believes project will result in harassment of GCWs if they are located in habitat within or adjacent to ROW during construction.	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. The supportive details in this technical reports are incorporated into the Final EIS and summarized (in part) in the following SH 45SW Biological Evaluation (See Appendix M).
USFWS - Golden Cheeked Warbler (GCW)	There are several issues in the dEIS related to Service trust resources that we believe must be examined in greater detail. Some of the issues are project related effects to listed species…[such as] the Golden-cheeked Warbler (GCW).	The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the Golden-cheeked Warbler Technical Report, which summarizes all Golden-cheeked Warbler surveys and habitat assessments since 2000 along with the best available scientific and commercial data. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the warbler has used the habitat over the past 14 years. The supportive details in this technical reports are incorporated into the Final EIS and summarized (in part) in the following SH 45SW Biological Evaluation (See Appendix M).
USFWS - impervious cover impacts	The Service has repeatedly expressed our concern about the potential for water quality degradation to occur in the Barton Springs Segment of the Edwards Aquifer associated with TxDOT projects located within the aquifer's Recharge Zone and the effects that degradation could have on the Barton Springs and Austin blind salamanders. Within the project ROW, 277.4 acres occur within the Recharge Zone, with an additional 31.7 acres in the Transition Zone. There are currently 17.2 and 5.7 acres of impervious cover in the Recharge and Transition Zones, respectively, within the project ROW. Construction of the preferred alternative would add about 47.9 acres of impervious cover into the Recharge Zone and 4 acres in the Transition Zone.	TxDOT believes that the performance standard established for permanent stormwater control measures are adequate to protect the aquifer. The City of Austin has published a report (Herrington and Hiers, 2010) that concludes there is no trend over time in the water quality at Barton Springs for constituents typical of highway runoff. The Draft EIS provided the findings of previously conducted and preliminary investigations that are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the SH 45SW Biological Evaluation (See Appendix M).

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USFWS - incomplete karst assessment	Without the karst assessment being finalized before the issuance of the dEIS, TxDOT is not able to fully and accurately describe the number of karst features, particularly within the Recharge Zone, that occur within the ROW or would be directly or indirectly affected by the project. Because the current karst study is incomplete, TxDOT based their karst analysis on a study from 2007. Supporting documentation was not included in the dEIS to justify the analysis of impacts to karst habitat or listed karst invertebrates. An example of the importance of a complete karst geologic survey can be seen in the different number of features found in the 2007 survey, compared to the ongoing study. During the 2007 karst investigation of the ROW, only 21 features were identified. However at the July 25, 2014 Technical Work Group meeting, the karst consultant stated that 220 features had been found thus far, including the 19 that are still under investigation. The Service believes that even more features will be uncovered as soil disturbance occurs during project construction. In the dEIS TxDOT states that only seven known features would be permanently sealed due to the implementation of the preferred alternative, however it is unknown if that number is based on the 2007 survey or the one currently being conducted.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - incomplete studies	The dEIS was submitted to the Service and other agencies for public comment before some of the environmental studies undertaken for the project, or their final reports, were complete; including the geological assessment and karst invertebrate surveys, and GCW habitat assessment and surveys. Because the final study reports were not included as appendices to the dEIS, detailed information on the methods and results were not available for review by the Service and other agencies. The information in these reports is vital in allowing reviewing agencies to determine if appropriate methods were followed to justify the effect analysis described in the dEIS.	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on November 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.

Organization	Verbatim Comment	Response
USFWS - lack of info	lack of sufficient information to verify TxDOT's conclusions on potential project effects	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - legal	The Texas Administrative Code requires an evaluation of "all reasonable alternatives satisfying the purpose and need…" of the project. The Service does not believe TxDOT has fulfilled this requirement in the dEIS. All of the alternatives mentioned in Chapter 2, except for the preferred and no action alternatives, were eliminated from consideration before any evaluation of their environmental effects. In addition, there are insufficient details for each proposed project alternatives to accurately evaluate their environmental effects. There is no description of the actions, such as construction methods, necessary to implement each of the project alternatives. Construction methods that would avoid or minimize project related effects must be considered for an accurate evaluation of the project effects.	Based on the evaluation of the preliminary alternatives, it was determined that the only reasonable build alternative was the New Tollway on Existing State-Owned Right-of-Way Alternative. Other preliminary alternatives either did not meet the purpose and need of the project or they were not reasonable due to their impacts. This determination was reinforced by an independent study of alternatives to SH 45SW conducted by City of Austin City staff, which included an evaluation of the construction of roundabouts on Brodie Lane. They concluded that "Brodie Lane roundabouts have not been pursued for further development as they are not a viable alternative to SH 45SW." They also evaluated more extensive improvements to Brodie lane and Manchaca road and concluded that "…just like SH 45SW, this proposal also comes with environmental constraints, including sensitive environmental areas, floodplain, parkland, Water Quality Protection Land and Balcones Canyonland Preserves, as well as the Edwards Aquifer Recharge and Contributing Zones…and improvements to widen the roadway would result in displacements…" (City of Austin, 2014).
USFWS - no take call premature for karst species	The Service believes it was premature for TxDOT to make a "no take" determination for listed karst species before all karst geological features and invertebrate surveys were complete and the Service had the opportunity to review the survey findings.	The Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project technical report fully supports the "no take" determination for any listed karst species. This report was made available to the participating agencies and the public on Nov. 7, 2014 and includes detailed methods and results of investigations. The supportive details in this technical report is incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.

Organization	Verbatim Comment	Response
USFWS - no-action alternative	DEIS does a poor job of describing the environmental effects of the no-action alternative or of comparing the effects of the no action alternative to the effects of the preferred alternative.	The evaluation of the No Build Alternative reflects the lack of action, and therefore, the absence of impacts associated with the construction of the Build Alternative. Where impacts outside of the existing conditions would occur, such as increased travel times, they are noted.
USFWS - SWPP and WPAP	TxDOT is required to develop and implement a stormwater pollution prevention plan and a water pollution abatement plan for the project, but they were not completed prior to the issuance of the dEIS and details of specific preventative and treatment actions that would be implemented were not available for review.	A Storm Water Pollution Prevention Plan is prepared prior to applying for a stormwater discharge permit. This preparation takes place while construction plans are developed. A Storm Water Pollution Prevention Plan has not been prepared because construction planning has not begun.
USFWS - Texella reyesi	The Service is concerned about potential affects to *Texella reyesi*, a listed karst invertebrate species. We acknowledge that the identification of the specimen from Barker Ranch Cave #1 is in question, since the specimen is a juvenile and no other *T. reyesi* have been found south of the Colorado River. However, until scientific findings indicate otherwise, the Service considers Barker Ranch Cave #1 to be occupied by *T. reyesi* and we believe there is potential for *T.reyesi* to be located in other karst features in the project area.	The standing expert on the species, Darrell Ubick of the California Academy of Sciences, has studied specimens from Barker Ranch Cave No. 1 and concluded that these specimens likely belong to Texella mulaiki. Based on this result it was concluded that the listed species, T. reyesi, does not occur in the project area. The Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project technical report fully supports the "no take" determination for any listed karst species. This report was made available to the participating agencies and the public on Nov. 7, 2014 and includes detailed methods and results of investigations. The supportive details in this technical report is incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS - vegetation removal and trogolobitic species	In addition to the increase in impervious cover, during project construction TxDOT would be removing about 159 acres of the 309 acres of vegetation currently in the ROW. Surface vegetation within 345 feet of the cave footprint is necessary to support the troglobitic species which occupy the cave. An infiltration study is currently underway to examine the groundwater infiltration influence on Flint Ridge Cave. The Service believes the information from this study is a significant step in understanding the project's impacts to the cave, and ultimately to the Edwards Aquifer, from surface pollutants related to SH 45 SW construction and operation.	The Biological Evaluation and the karst invertebrate technical report (Appendix M of Final EIS) address the removal of vegetation and illustrate the distance of the roadway from the 105 meter cricket foraging area. The project would not affect the troglobitic species in the cave. The infiltration study underway by the City of Austin will not likely be complete in time to be included in the Final EIS. Additionally, the results from a drip study may not provide additional information.
USFWS (p. 1) - legal	There is no Federal nexus for this project, therefore, the dEIS has been prepared in accordance with the Texas Administrative Code, 43:1 Chapter 2, and is not required to comply with the National Environmental Policy Act (NEPA) requirements for an EIS.	Comment noted.
USFWS (p. 2) - legal	State environmental document does not comply with NEPA requirements for content, coordination, review, oversight, approval, and dispute resolution. With no federal nexus TxDOT's obligation to comply with other federal regulations is also minimized	Comment noted.

Organization	Verbatim Comment	Response
USFWS (p. 3) - direct & indirect effects	The Service does not believe the dEIS does an adequate job of evaluating the direct and indirect effects of the proposed project on listed species. The project analysis is generally limited to the ROW and does not take into consideration the potential for adverse effects to occur beyond the limits of the ROW	The intent of the Environmental Impact Statement is to provide a full and fair discussion of significant environmental impacts to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. The obligation of the lead agency is to provide a concise, clear, and to-the-point statement that shall be supported by evidence that the agency has made the necessary environmental analyses. The Draft EIS provided the findings of previously conducted and preliminary investigations. These findings are further supported by the following finalized technical reports: Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas; Golden-cheeked Warbler Technical Report; and Potential for Impacts to Endangered Eurycea salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas. These reports were made available to the participating agencies and the public on Nov. 7, 2014 and include detailed methods and results of investigations. The supportive details in these technical reports are incorporated into the Final EIS and summarized (in part) in the following Final EIS addendum reports: SH 45SW Biological Evaluation; and Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas, State Highway 45SW.
USFWS (p. 4) - GCW inadequate surveys	In regards to TxDOT's analysis of potential project effects to the GCW, your "no take" determination is based on a single year of GCW surveys within the SH 45 SW ROW and the negative GCW habitat assessment. Documentation for these evaluations was not included in the dEIS, nor submitted to the Service for review. A single year of presence/absence surveys, for a highly mobile, migratory species like the GCW, is not sufficient information on the long-term use of the area by GCW to justify a no take determination. The GCW survey protocol also requires the survey to extend 300 feet beyond the edge of the ROW.	The Draft EIS provided a summary of previously conducted and preliminary investigations. The details of previously conducted Golden-cheeked Warbler surveys and habitat assessments since 2000 are presented in the State Highway 45SW: Golden-cheeked Warbler Technical Report (Appendix M) along with the best available scientific and commercial data, and is summarized in the Final EIS. The report concludes that the project would not reduce the likelihood that the Golden-cheeked Warbler would successfully use habitat adjacent to the project below the frequency that the Golden-cheeked Warbler has used the habitat over the past 14 years.

Organization	Verbatim Comment	Response
USFWS (p. 5) - karst protocols during construction	Also, TxDOT does not discuss how they plan to address impacts to previously unknown subsurface karst features if they are discovered during construction and contain protected karst species.	Methods for responding to previously unknown karst features, i.e. features encountered during construction, were described briefly on page 311 in the Mitigation and Permitting section and in detail within Appendix H (page H-34) of the Final EIS. Standard TxDOT procedures would be followed if a previously unknown sensitive feature is encountered during the construction phase. Features that may be encountered during construction include voids or water flowing through a conduit in bedrock. Equipment operators would visually check for these features during construction. If encountered, all excavation or other construction activity would immediately stop in the area. Equipment operators would notify their supervisor. Additional notices would be made to the TxDOT District Environmental Quality Inspector and specialists in the environmental section. These personnel would decide on an appropriate protective setback distance for the feature and any other appropriate best management practices to protect the feature while its significance is analyzed. Fencing or other barriers would be installed to prevent equipment operators from disturbing the protected setback area. The feature and its protective setback would be identified in the next regular on-site safety briefing. Any newly discovered feature would be inspected by a consulting geologist and biologist as appropriate and under the supervision of District scientists. The feature location would be surveyed and its extent documented as allowed by human accessibility. Biological surveys would be conducted as warranted by feature type. Feature specific plans would be developed to protect the feature, if determined to be sensitive and as allowed by location, with the plans to be reviewed by Texas Commission on Environmental Quality prior to implementation. Location relative to the road alignment and concomitant structural concerns may result in a decision to collapse or fill a previously unknown feature. A technical report, Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas, addresses this comment.

Organization	Verbatim Comment	Response
USFWS (p. 6) - BMPs	Repairing a BMP after it has failed would not reduce or mitigate the environmental impacts resulting from that failure. This is especially relevant since the water quality BMPs would also be used as hazardous material traps. In order to ensure no adverse effects, TxDOT would need to be able to prevent outflows from the BMPs after hazardous material spills, including during extreme weather events.	Page 6, 1st paragraph: The environmental compliance management plan along with an environmental compliance manager would be in effect during the construction phase. Appropriate actions would be taken to reduce any environmental impacts from a temporary stormwater control failure during construction. Repairing construction phase sediment controls is appropriate to prevent impacts. Regarding operational phase hazardous material traps, they would be incorporated into all water quality ponds. The hazardous materials traps would contain at least 10,000 gallons of stormwater, or liquid hazardous materials in the event of a spill. A siphon device can be incorporated into the feature to drain the trap after it becomes full from a rain event. Such devices are installed at an elevation above the full capacity of the trap in order to contain any spill that does not occur during a rain event (Texas Commission on Environmental Quality 2007). In the final design phase, TxDOT will consider all prudent design elements including the best way to completely contain potential discharges of hazardous materials. In addition, the likelihood of a spill occurring is low. TxDOT compiled and analyzed roadway spill data from federal, state, county and city databases for the time period 2003-2012 to quantify the probability of an accidental spill of hazardous liquids from mobile sources (i.e. vehicles, tanker trucks) occurring within the proposed project. TxDOT calculated that a maximum of 5.6 hazardous liquids spills per billion vehicle miles traveled occurred on one of three existing parkways and highways in Travis County that are most similar to the proposed project.
USFWS (p. 7) - effects of project on non-ESA protected wildlife	Our last issue with the dEIS relates to the proposed project's effects on wildlife that are not protected under the Act. TxDOT relies heavily on the Texas Parks and Wildlife Department's Natural Diversity Database (NDD) for your determination of effects to rare species. However, the NDD is not a complete database of the locations of rare species and should only be used as a tool in the evaluation of affects to these species, along with information on the species life history and habitat, and site specific habitat evaluations. The NDD alone may provide inaccurate information on the species that may be present in the project area. Effects to non-listed species are also readily dismissed in the dEIS, stating that any wildlife in the project area will be displaced to adjacent habitat. However, that conclusion does not take into consideration the habitat quality or the carrying capacity of the adjacent areas for any displaced species. The dEIS also does not take into account the wildlife that will be directly harmed by construction of the project. We recommend TxDOT revise the dEIS discussion related to state listed and non-listed wildlife resources.	The Final EIS references the possible impacts of the project on state-listed and non-listed wildlife resources that are evaluated and presented in the Biological Evaluation (See Appendix M).

SH 45 SW
ENVIRONMENTAL STUDY

Attachment A

Agency Comments Received

Received by Certified Mail

Barton Springs
Edwards Aquifer
CONSERVATION DISTRICT

August 13, 2014

Mr. Lucas Short, P.E.
Mr. Carlos Swonke
Texas Department of Transportation Austin District
P.O. Drawer 15426
Austin, TX 78761-5426

Dear Mr. Short and Mr. Swonke:

The Barton Springs/Edwards Aquifer Conservation District (District) appreciates the opportunity to provide comments on the Draft Environmental Impact Statement (DEIS) for the State Highway 45 Southwest (SH 45SW) project. As you are aware, the District has worked with the Texas Department of Transportation (TxDOT) on the SH 45SW project over the past 25 years and has provided input into the development of the roadway at the opportune times. As a groundwater conservation district with the statutory mandate to preserve, conserve and protect the Edwards Aquifer, and other aquifers within the District, we take these responsibilities very seriously.

In addition to our statutory mandate, the Consent Decree (Decree) between the District and TxDOT signed on January 23, 1990 by Judge Walter Smith of the U.S. District Court served as the general frame of reference for our review of the DEIS. We view the court-ordered Decree as the guiding document assuring the District's role in this project and TxDOT's responsibility for designing and building the roadway to the highest level of environmental protection possible.

We appreciate TxDOT's willingness to work with the Participating Agencies over the past two years. We recognize the amount of resources, time, and expertise TxDOT and the Participating Agencies have committed to assure the safety of travelers as well as the delicate resource of the Edwards Aquifer.

Due to the timing of this document and significant data not yet available we are providing our comments in a general nature and will provide detailed analysis ongoing as additional information is made available. Comments on the DEIS have been grouped into general categories and are provided below.

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Consent Decree

- The Decree is not mentioned in the DEIS. Since the Decree commits TxDOT to constructing the SH 45 SW to the highest level of environmental protection practicable, we request reference to these commitments in the Executive Summary, in Section 1.2, Project History, Appendix H and other pertinent sections of the DEIS. Such reference will affirm TxDOT's intent to uphold the agreed intent of the Decree and continue to provide opportunities for the District to offer meaningful input on the project.

- Because of the District's commitment to seeing that the objectives of the Decree are fully implemented in the project, the District intends to be involved throughout all stages of the project and will provide comments to TxDOT as needed until project completion. To this end, the District requests TxDOT's cooperation in securing, in TXDOT's development agreement with the Central Texas Regional Mobility Authority (CTRMA), a commitment from the CTRMA to honor the applicable provisions of the Decree that involve the CTRMA's designated role in the project.

- Due to the role provided to the District by the Decree, we request to be added to the list of agencies to be notified by the void discovery protocols.

- Some of the BMPs mentioned in the Decree were considered to be highly protective of the environment at the time the Decree was signed in 1990. However, techniques for environmental protection have advanced considerably since that time. The District would like for the project to commit to the highest level of protection practicable using the latest technology and methods for BMPs. To this end, the District agrees to continue ongoing discussions to achieve this goal.

Construction and Post-Project Monitoring

- The District supports the inclusion of an Environmental Compliance Manager for the construction phase of the project as suggested by the Technical Working Group.

- The baseline Total Suspended Solids (TSS) used to measure the 90% removal should be determined using the lesser of the 80 mg/L standard and the actual background TSS levels measured at the site.

- To provide for pre-construction and post-construction monitoring of aquifer conditions in the vicinity of the roadway, TxDOT should install five monitor wells. Two of these would be to the southwest of the roadway to provide for monitoring of up-gradient groundwater quality. Three monitor wells would be installed northeast of the roadway to provide for down-gradient monitoring of groundwater quality. The District would consider long-term monitoring responsibilities of these wells.

- The District further recommends: 1) continued monitoring post-construction to measure the effectiveness of the stormwater BMPs in achieving the 90% TSS removal standard

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and removing dissolved constituents and 2) commitments to mitigation should the BMPs not provide long-term average removal rates as designed.

Additional Data/Clarification

- The DEIS references 38 wells in the area of influence (Section 3.6.1, Existing Conditions-Groundwater Discharge). District records indicate that there are 150 wells in the area of influence. A map showing the locations of these wells is attached to this letter. These data can be provided by the District upon request. Further review of potential impact to the Edwards Aquifer should be conducted with consideration of this updated data set.

- In the subsection Land Use under Section ES.5, of the executive summary, there is a statement that cites the District as concluding that there is limited influence on the amount and pace of development of the project. The District has not analyzed this factor or come to this conclusion. Please remove any such reference to the District.

Karst Features

- Based on site visits by District staff, it is clear that the field activities, that are a part of the Geological Assessment (GA), go beyond the earlier assessments that have been conducted. Of the hundreds of potential karst features within the highway right-of-way, excavations have made it possible to better assess the sensitivity of each feature. The final GA should incorporate this assessment and provide detailed explanations for why each of the identified potential karst features are considered to be either sensitive or not sensitive.

- If the karst features southwest of Flint Ridge Cave (Holes #2619, 2600, 2734, and 2603) are determined to be not sensitive, we request that TxDOT consider moving the roadway alignment further away from the Flint Ridge drainage basin. The District further recommends consideration of adjustments to alignment and other design elements that will protect the sensitive features and minimize the impacts to catchment areas and the quantity of interrupted recharge. Examples of other design elements that have proven successful on other projects in the area include: grade separation and the use of curb and gutters and culverts to convey stormwater to BMPs or off the recharge zone.

- The District intends to provide additional comments once the GA report is available and then again when the final EIS is complete. The District will evaluate the designation of significant karst features and their spatial relationship to the highway alignment and BMPs.

BMPs and Pollution Prevention

- The proposed use of permeable friction course (PFC) is a good option for BMPs that will provide a high level of environmental protection when used in conjunction with other

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BMPs. PFC can be a very effective BMP provided that there is adequate, long-term maintenance of the material.

- The Environmental Compliance Management Plan describing BMP maintenance commitments is referenced in the DEIS, but was not available for review. The District requests an opportunity to review the maintenance plans when available, particularly as it describes commitments to maintenance of the PFC material.

- The District recognizes that the plans and the proposed BMPs in the DEIS are schematics that may be subject to change. The District reserves the opportunity to provide a detailed review of the final BMPs and stormwater treatment techniques at the opportune time.

- The current DEIS references the intent to allow short-term onsite storage of hazardous materials in the project area and within the 100-yr floodplain. The District strongly recommends that any equipment fueling or hazardous material storage, even if short-term, should be offsite and off the recharge zone.

The District appreciates the opportunity to provide comments to the DEIS. We look forward to working with TxDOT through project completion by applying the District's resources and expertise towards the mutual objective of achieving the highest level of aquifer protection practicable.

Sincerely,

John T. Dupnik, P.G.
General Manager

Enclosure

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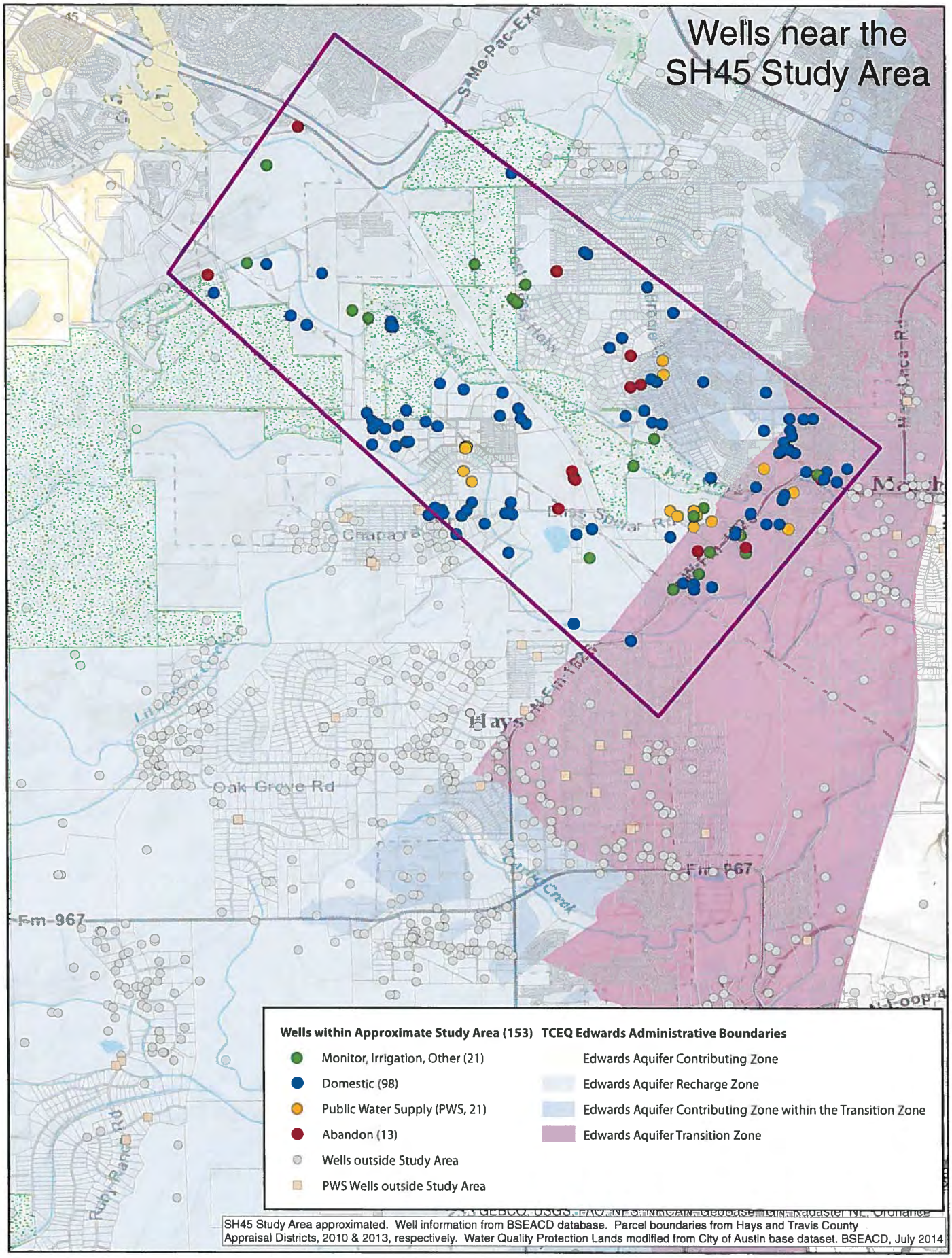
Wells near the SH45 Study Area
Oak Grove Rd
Fm 967
Hays
Wells within Approximate Study Area (153)
Monitor, Irrigation, Other (21)
Domestic (98)
Public Water Supply (PWS, 21)
Abandon (13)
Wells outside Study Area
PWS Wells outside Study Area
TCEQ Edwards Administrative Boundaries
Edwards Aquifer Contributing Zone
Edwards Aquifer Recharge Zone
Edwards Aquifer Contributing Zone within the Transition Zone
Edwards Aquifer Transition Zone
SH45 Study Area approximated. Well information from BSEACD database. Parcel boundaries from Hays and Travis County Appraisal Districts, 2010 & 2013, respectively. Water Quality Protection Lands modified from City of Austin base dataset. BSEACD, July 2014

Received by Standard Mail

T.X.D.O.T.
RECEIVED
AUG 14 2014
DISTRICT 14 - MAIL ROOM
AUSTIN, TX

Barton Springs Edwards Aquifer
CONSERVATION DISTRICT

August 13, 2014

Mr. Lucas Short, P.E.
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Texas Department of Transportation Austin District
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- The District intends to provide additional comments once the GA report is available and then again when the final EIS is complete. The District will evaluate the designation of significant karst features and their spatial relationship to the highway alignment and BMPs.

BMPs and Pollution Prevention

- The proposed use of permeable friction course (PFC) is a good option for BMPs that will provide a high level of environmental protection when used in conjunction with other

BMPs. PFC can be a very effective BMP provided that there is adequate, long-term maintenance of the material.

- The Environmental Compliance Management Plan describing BMP maintenance commitments is referenced in the DEIS, but was not available for review. The District requests an opportunity to review the maintenance plans when available, particularly as it describes commitments to maintenance of the PFC material.

- The District recognizes that the plans and the proposed BMPs in the DEIS are schematics that may be subject to change. The District reserves the opportunity to provide a detailed review of the final BMPs and stormwater treatment techniques at the opportune time.

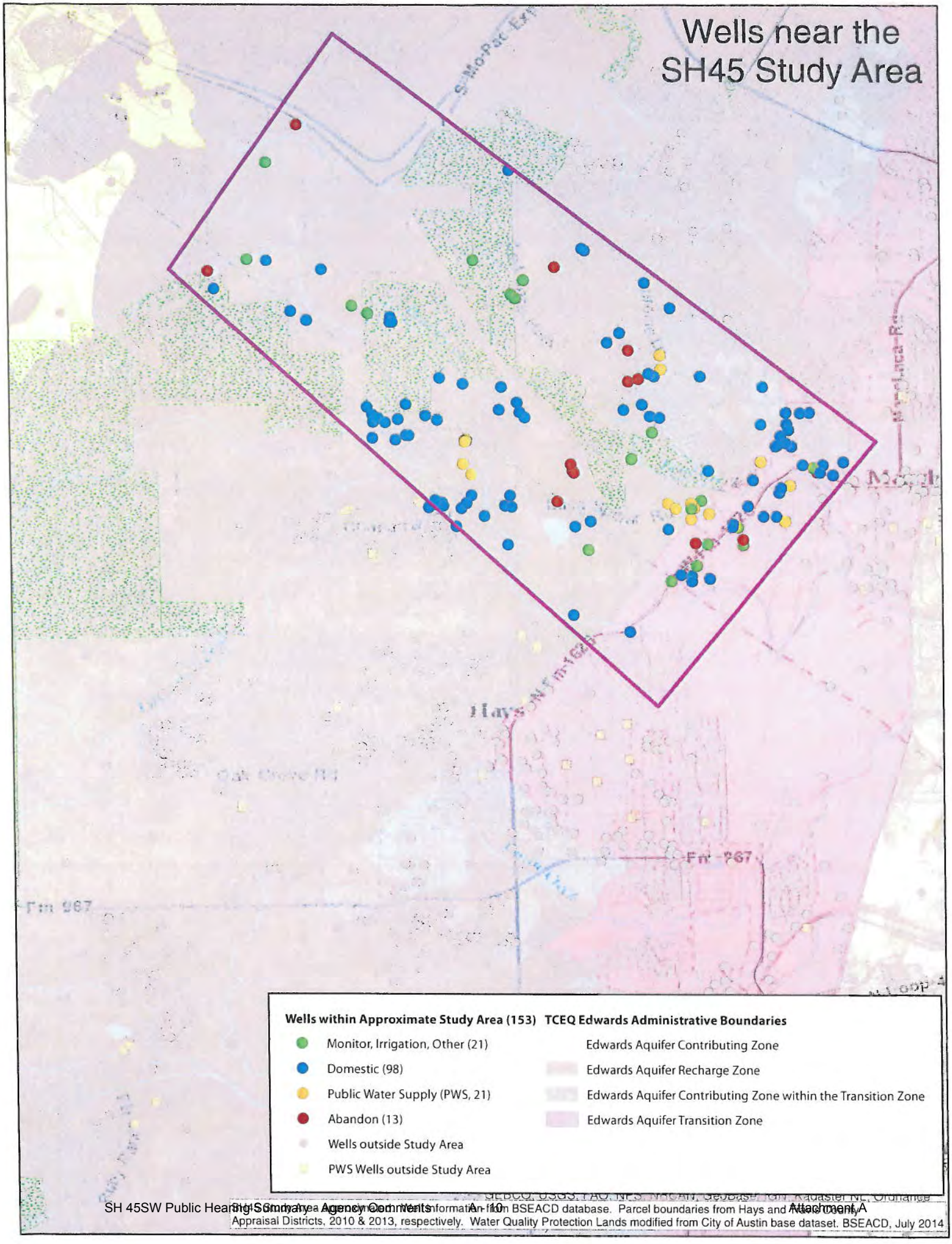
- The current DEIS references the intent to allow short-term onsite storage of hazardous materials in the project area and within the 100-yr floodplain. The District strongly recommends that any equipment fueling or hazardous material storage, even if short-term, should be offsite and off the recharge zone.

The District appreciates the opportunity to provide comments to the DEIS. We look forward to working with TxDOT through project completion by applying the District's resources and expertise towards the mutual objective of achieving the highest level of aquifer protection practicable.

Sincerely,

John T. Dupnik, P.G.
General Manager

Enclosure


Wells near the
SH45 Study Area
Hays
Fm 967
Wells within Approximate Study Area (153)
Monitor, Irrigation, Other (21)
Domestic (98)
Public Water Supply (PWS, 21)
Abandon (13)
Wells outside Study Area
PWS Wells outside Study Area
TCEQ Edwards Administrative Boundaries
Edwards Aquifer Contributing Zone
Edwards Aquifer Recharge Zone
Edwards Aquifer Contributing Zone within the Transition Zone
Edwards Aquifer Transition Zone
Wells information from BSEACD database. Parcel boundaries from Hays and Travis County Appraisal Districts, 2010 & 2013, respectively. Water Quality Protection Lands modified from City of Austin base dataset. BSEACD, July 2014

City of Austin
Founded by Congress, Republic of Texas, 1839
Watershed Protection Department
P.O. Box 1088, Austin, Texas 78767

August 13, 2014

Texas Department of Transportation
Austin District
Attn: Stacey Benningfield
P.O. Drawer 15426
Austin, TX 78761-5426

Dear Ms. Benningfield:

The City of Austin's comments on the State Highway 45 Southwest (SH45 SW) draft Environmental Impact Statement (DEIS) are attached for your review and consideration. The City appreciates being included as a participating agency in the environmental review and for the discussions between our organizations over the past year regarding the City's concerns about this project. As City staff has stated many times, decisions about the proposed roadway should be based on the best available scientific and engineering information analyses. We hope that the comments we are providing on the DEIS are helpful in meeting our shared goals of protecting the very sensitive environment in the area and providing effective transportation for Austin and surrounding areas.

As discussed in the July 23, 2014 letter from Austin City Manager Marc Ott, the City finds that the DEIS does not adequately demonstrate that impacts to the natural and human environment will not be significant. There are ongoing environmental studies, including TXDOT's own karst survey, that are likely to provide information critical to a thorough assessment of the environmental impacts of the proposed project. The DEIS falls short in its consideration of project alternatives, in the transportation analysis, in the evaluation of the effectiveness of temporary and permanent water quality controls, and in its assessment of potential impacts to endangered species, sensitive karst features, groundwater, and surface water. Without adequate scientific and engineering analyses, a proper assessment of sensitive environmental features, and a more rigorous analysis of best practices to minimize water quality degradation, the DEIS is incomplete and does not meet the standards in state law for a Finding of No Significant Impact (FONSI). Furthermore, it does not reach the publicly stated goal that SH45 SW will be the most environmentally sensitive road ever built in Travis County.

Of particular concern to the City is protection of Flint Ridge Cave, a cave protected under Austin and Travis County's federal Balcones Canyonlands Conservation Plan permit (BCCP). Because Flint Ridge Cave is designated in the BCCP as mitigation for development activity in large areas of western Travis County, the level of protection necessary is higher than other similar, but not protected, karst features. The DEIS does not currently demonstrate how the project will achieve that level of protection.

In meetings with TXDOT and the Central Texas Regional Mobility Authority (CTRMA) there have been discussions about incorporation of water quality controls to achieve a non-degradation water quality standard equivalent to that required for new development in this area. The water quality controls and standards described in the DEIS will not achieve that level of water quality protection. The City would like TXDOT and CTRMA to consider adoption of water quality treatment standards that meet the community's standard-of-practice for non-degradation. There may be opportunities for the City, TXDOT, and CTRMA to work together to reduce the impact to the project of meeting this standard and provide a superior level of environmental protection than is currently proposed. We suggest that a small group from the Technical Work Group could work directly with the project design team to discuss how the project could achieve a non-degradation water quality standard.

The City has requested that the DEIS be withdrawn, revised, and re-published to allow this important additional work to be completed. If that is not feasible, the City would welcome an opportunity to participate in an alternative process to incorporate pending environmental studies and enhanced environmental design standards into the environmental impact analysis and in the design of the roadway.

Again, we appreciate the cooperation and consideration TXDOT and CTRMA have provided the City over the last year as this project moved through initial assessment and design. We realize that TXDOT and CTRMA have many projects underway or proposed in the Austin area and we look forward to working together to improve mobility throughout the region. Our staff is available to meet with the TXDOT and CTRMA project team to review and further discuss our comments. The City's lead for the SH45 environmental review is Chuck Lesniak, the City's Environmental Officer. Please contact him at your convenience at (512) 974-2699 with any questions or to arrange a meeting to discuss the City's comments.

Sincerely,

Victoria J. Li, P.E., Director
Watershed Protection Department

Rob Spillar, P.E., Director
Transportation Department

Attachment

Cc: Marc Ott, City Manager
Sue Edwards, Assistant City Manager
Robert Goode, Assistant City Manager
Chuck Lesniak, Environmental Officer
Mike Personett, Watershed Protection Department
Willy Conrad, Austin Water
Mitzi Cotton, Law Department

The City of Austin is committed to compliance with the Americans with Disabilities Act.
Reasonable modifications and equal access to communications will be provided upon request.

Comments on the Draft Environmental Impact Statement
for the Proposed State Highway 45 Southwest

City of Austin, Texas

1.0 Introduction

On June 27, 2014 the Texas Department of Transportation (TxDOT) published for public comment a draft Environmental Impact Statement (DEIS) for the proposed State Highway 45 Southwest (SH45 SW). The DEIS identifies a "preferred alternative", which would involve the construction of a limited access tolled roadway consisting of four lanes, shoulders, and a shared-use path for pedestrians and bicyclists. The preferred alternative would traverse approximately four miles of currently undeveloped land within in an existing state-owned right-of-way and would connect the southern terminus of MoPac (Loop 1) with FM1626. A public hearing to accept public comment on the DEIS occurred on July 29, 2014 and the public comment period on the DEIS is scheduled to close on August 13, 2014. The final EIS (FEIS) and a record-of-decision (ROD) are anticipated in early 2015.

The preferred alternative is the latest incarnation of what was once referred to as Segment 3A of the Austin Outer Parkway (a.k.a. outer loop) that was first proposed in the mid-1980s. The City of Austin (the City) has long had an interest in the proposed project, both in terms of its potential effects on regional mobility and its potential adverse impacts on sensitive environmental resources. For the current environmental review process, the City requested and received participating agency status and in that request the City stated its readiness *"…to assist with a careful and thorough evaluation of the SH45 SW project through the Federal environmental review process prescribed by the National Environmental Policy Act (NEPA)."* Previously, in comments submitted by the City on the scope of the environmental review (document dated October 8, 2013), the City reiterated the importance of there being *"…a full and balanced evaluation of the potential benefits, costs, mobility and environmental impacts of SH45 SW and its alternatives, including alternative alignments, improvements to existing roadways and the 'no build' alternative."*

Technical and management staff representing three City departments (Transportation, Water, and Watershed Protection) have thoroughly reviewed the DEIS and are of the general opinion that it falls well short of the City's stated expectations that there be an objective, balanced, and thorough review of the potential environmental impacts of the project based on the best available scientific information and engineering analysis. Overall, the City believes the DEIS is fundamentally flawed, and that some of the flaws are the result of deficiencies in process while many others are of a technical nature. Accordingly, in a letter from the City Manager to TxDOT dated July 23, 2014, the City formally requested that the DEIS be withdrawn and reissued only when its many significant flaws and deficiencies have been adequately addressed.

Discussed below are the City's most significant comments and concerns about the DEIS, as well as suggestions about how to address its shortcomings. Additional detailed comments on the DEIS, appendices, and supporting documents are attached.

2.0 Deficiencies in the Environmental Review Process

The City believes that the environmental review process as a whole, and the resulting DEIS, is fundamentally flawed in that it appears to have been predisposed to a finding that the preferred alternative is needed, will provide significant mobility benefits, and that it can be constructed and operated without significant impacts to sensitive environmental resources. Specifically, the City views the process itself to be flawed on the basis of the following:

- The environmental review was to have been conducted under the Federal NEPA, but actions were taken to shift allocated Federal funding out of the budget to enable the environmental review to proceed under State regulations. This was done with the publicly stated objective of expediting the environmental review process. Also, during the course of the environmental review process project funding agreements have been executed with Travis and Hays counties and the presumed implementing agency, the Central Texas Regional Mobility Authority (CTRMA), has initiated a procurement process for engineering design services well in advance of the draft EIS, which could limit the ability of the chosen design engineer to incorporate the requirements of the EIS..

- The formulation and evaluation of alternatives is developed in such a way as to favor the preferred alternative. This is discussed further below.

- The DEIS was issued prior to the completion of several critically important investigations that are either currently underway or only recently completed and not fully documented, the results of which may influence the key findings in the DEIS. Further, the published schedule for the FEIS and ROD will not allow time for completion of all ongoing studies in time for the results to be considered in the FEIS. These studies described below.

- With the exception of the indirect effects analysis, the defined study area for the environmental review is limited to the areas in immediate proximity to the right-of-way. To ensure a thorough review of potential impacts and alternatives, the study area should be expanded to include Slaughter Lane and the entirety of Brodie Lane south of Slaughter and east to Manchaca Road and west to the Oak Hill area.

- While there has been a "participating agency" process that has included the City of Austin and other governmental entities, it has not been as robust as might have been expected for a project with such a long history of controversy and with very well-known concerns about the environmental sensitivity of the project area. The Technical Working Group and its subgroups on

karst and water quality protection have not met frequently or long enough to fully delve into these complex issues in a fully collaborative manner. For example, the TxDOT and City of Austin personnel were to have collaborated closely to refresh an engineering analysis of stormwater treatment strategies previously conducted. This collaboration did not occur. Also, City staff has repeatedly suggested that a single technical working group be established to address common issues of concern about other potential TxDOT/CTRMA roadway projects that are within the Barton Springs Zone (BSZ) of the Edwards Aquifer (i.e., the Oakhill Parkway and potential expansion of South MoPac including the intersections at Slaughter Lane and La Crosse Avenue).

- On several occasions in Technical Work Group meetings and other forums, City staff has suggested that the environmental review of the proposed SH45 SW be looked at in a broader regional context. Specifically, the City has concerns about the potential cumulative impacts of the aforementioned major roadway projects on the quality of water recharging the BSZ, in the aquifer, and at Barton Springs. This suggestion was not addressed in the DEIS.

3.0 Compatibility with the City's Comprehensive Land Use Plan – Imagine Austin

The City of Austin's Charter requires adoption of a comprehensive plan that includes the City's policies for growth and development of land within the corporate limits and the extraterritorial jurisdiction of the City. In June 2012, the Austin City Council, after nearly three years of extensive community involvement and input, adopted a new comprehensive land use plan, known as the *Imagine Austin Comprehensive Plan* (IACP). The IACP provides a vision to guide the City's development and re-development over a 30-year period. Central elements of that vision are that Austin will become more compact and connected and that the City will sustainably manage natural resources, preserve and protect environmentally sensitive areas, and integrate nature into the City.

In terms of the proposed SH45 SW project, the IACP is clear that the City does not support the project. Of particular note is that the SH 45 SW connection was purposefully excluded from the Roadway Networks (Figure 4.4) and Growth Concept (Figure 4.5) maps of the adopted IACP. In addition, the following "priority actions" are called out in the IACP:

- *"Ensure consistency between the Growth Concept Map Series and regional transportation plans by amending the Austin Metropolitan Area Transportation Plan to remove SH 45 SW and requesting its removal from the Capital Area Metropolitan Planning Organization 2035 Regional Transportation Plan."* (Policy Action LUT A46)

- *"Protect Austin's natural resources and environmental systems by limiting land use and transportation development in sensitive environmental areas and preserving areas of open space."* (Policy Action LUT P22)

On May 15, 2014 the Austin City Council adopted a resolution (CR20140515-022) which acknowledges the conflict between the IACP and "*…confirms its serious concern about the proposed SH45 SW toll road based on currently available information.*". The DEIS should disclose and acknowledge that SH45 SW is in conflict with Austin's comprehensive plan and because most of the road is within Austin's jurisdiction the DEIS should consider how SH45, if built, could address the goals of the IACP.

4.0 Purpose and Need

State regulations require that all reasonable alternatives that meet the stated purpose and need for a roadway project be evaluated in the environmental review process (43 TAC 2.84). As described in the DEIS, the purpose and need for the project appears to be based solely on projected future travel delays and does not give adequate consideration to the need to increase the capacity of the larger roadway network in the area. In the DEIS the "need" or justification for the project is based on the results of modeling that *"…indicate that travel times along existing routes in northern Hays and southern Travis Counties in 2035 are projected to be nearly 80 percent longer on average than observed travel times in 2014."* The DEIS goes on to conclude that the construction of the preferred alternative will reduce travel times on non-tolled roadways by approximately 23 to 28 percent. Contrary to the implications of the DEIS, commuters passing through and residents of the area will not experience relief from future congestion. In fact, modeling indicates that under the preferred alternative, projected travel times along non-tolled roadways are reduced approximately 25 percent below those projected without the tollway. This is still an increase of roughly 60 percent by 2035 rather than the 80 percent increase with the road project. A 60% increase in travel time is a significant increase and raises the question as to whether the preferred alternative is a wise investment in terms of its financial and environmental costs versus projected mobility benefits and whether there are other alternatives with the potential to achieve equal or greater mobility benefits with less cost and/or risk of irreversible environmental impact.

5.0 Alternatives Analysis

The DEIS is also generally lacking in a thorough analysis of alternatives and consideration of "system" impacts and does not provide sufficient detail for the reader to understand the analysis of alternatives. Specific concerns about the definition and analysis of alternatives are:

- Of the preliminary roadway construction alternatives considered, aside from the "Upgrade Existing Roadways" preliminary alternative, the remaining two are tollways either on a new location or the existing state-owned right-of-way. This improperly slants the analysis in favor of the preferred alternative as the ROW already exists.

- To meet stated purpose and need, the DEIS "Upgrade Existing Roadways" preliminary alternative identified a four lane highway with frontage roads and a 300-foot ROW. Frontage roads are necessary because the adjacent land along existing roadways is already developed. Expansions to Brodie Lane, Slaughter Lane, and Manchaca Road were eliminated as alternatives because the potential impact of a four lane highway with frontage roads will have 167 total relocations/displacements (Brodie/Slaughter) or 225 total relocations/displacements (Manchaca-FM2304/Slaughter). Although the DEIS states *"residential and commercial relocations could potentially be reduced…it would not be possible to totally eliminate all relocations….this alternative is not considered reasonable and was eliminated from further consideration."* (DEIS, p. 18). With reduced ROW, displacements could be reduced but to what extent remains unknown as it was eliminated from further consideration.

- The potential to maximize existing roadways as urban arterials should have, but was not, fully considered. While cost is a major consideration in any improvements within the existing roadway corridors, 3-, 4-, or even 5-lane cross sections with signalized intersections or non-signalized continuous flow intersections could be viable and might provide relief to congestions and alter travel times similar to what might be accomplished by the current preferred alternative.

- The DEIS did not provide sufficient technical analysis of the alternative to demonstrate an ability to satisfy the stated purpose and need.

- The DEIS fails to consider the individual or collective costs, benefits, and impacts of an "arterial solution" involving additional multiple routes (e.g., Brodie Lane, Manchaca Road, South 1st Street, FM 1626).

- The DEIS fails to adequately consider and evaluate the potential to improve mobility through the implementation of Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies, both individually and in combination with the potential improvements described generally above.

6.0 Independent Utility and Cumulative Impacts

According to the DEIS, the proposed project is said to have "independent utility" as a stand-alone transportation improvement that is not dependent upon other transportation improvements in the area. While this finding may be correct based on a strict application of the State's definition of "independent utility", it is apparent that in reality the proposed project is not independent but rather is part of a larger, interconnected regional transportation network. This is evidenced in part by the fact that the project is included in the Capital Area Metropolitan Planning Organization (CAMPO) 2035 Regional Transportation Plan which *"…identifies the construction of SH 45SW between FM 1626 and MoPac as part of the region's transportation improvements"* and that the proposed project is expected to "*…contribute to improving the overall function of the transportation system in this area."* (DEIS Chapter 1- Purpose and Need for the Action p. 10) Modeling to evaluate the projected mobility benefits of the preferred alternative was conducted at a regional scale with the assumption that all related improvements included in the CAMPO 2035 Regional Transportation Plan are in place and operational. These include potential major improvements to South Loop 1 (i.e., addition of managed lanes, reconfiguration of intersections on South Loop 1 at Slaughter Lane and LaCrosse Avenue) and improvements to the U.S. Highway 290 and State Highway 71 in the Oak Hill area (i.e., the Oakhill Parkway.

The CAMPO 2035 Plan includes SH 45 SW from FM 1626 to IH 35 as a preliminary design study, without funds for engineering and construction. Other potential future roadway projects have recently come to the fore in discussions about development of the 2040 CAMPO regional transportation plan. Specifically, requests have been made to model, evaluate and consider funding sources to plan a future extension of SH 45 SW from the current termini at RM 1825 north across Lake Austin to FM 620 in the full purpose limits of the City . SH 45 SW, FM 1626 to IH35, is proposed for modeling in the CAMPO 2040 Plan update process as a 6-lane elevated toll road. These discussions suggest that the preferred alternative is in fact being viewed by some as one component of a larger regional project that would complete the southern and western segments of an outer loop.

Because of the determination that the preferred alternative has independent utility, the scope of the environmental review has been limited to the defined study area. As previously noted, the study area should be expanded to include the extent of the existing arterials and other roadways that were included in travel time modeling. Furthermore, potential environmental impacts of the preferred alternative cannot be fully understood in isolation but rather should be evaluated at a regional scale that includes analysis of the potential cumulative impacts of other potential roadway projects, specifically the aforementioned improvements to MoPac South and the Oak Hill Parkway. All of these projects overlie the BSZ and all have the potential to increase water pollutant loads and degrade the quality of water entering into, withdrawn from, and discharged from the Barton Springs Segment of the Edwards Aquifer.

The proposed roadway only serves to deliver traffic from FM1626 to South MoPac, neither of which are dense residential or commercial nodes. Thus it is clear that SH45 is not independent, but simply a segment of a larger state road network As such, the City believes these to be connected and/or cumulative actions as defined by 40 CFR Section 1508.25(a) and that a programmatic EIS should be conducted under the Federal NEPA process.

7.0 Impacts to Sensitive Karst Features

It is well-established that the density of major karst recharge features (caves and large sinkholes) in and near the SH45 SW right-of-way are among the highest densities found in the Edwards Aquifer Recharge Zone. It is also well-established scientifically that a significant portion of recharge occurs in upland areas in a diffuse manner, in addition to concentrated recharge at observable karst features. Accordingly, the City has serious concerns about the potential adverse impacts of the preferred alternative on known karst features, on subsurface features that do not have expression on the land surface, and on diffuse recharge in areas altered by the project.

The City appreciates the significant additional field work that has and is being performed by TxDOT to identify and characterize karst features within the right-of-way. However, as previously noted, the DEIS should not have been released prior to the completion of all geological investigations, including particularly the completion of the City's current investigation to determine the extent of the subsurface drainage basin to Flint Ridge Cave, which is discussed below.

The Balcones Canyonlands Preserve system (BCP) was established by the City of Austin and Travis County to protect various rare, threatened, and endangered species. As partners in the BCP, the City and Travis County jointly hold an 'incidental take" permit under the federal Endangered Species Act. By providing species protection on preserve lands, private land development and public infrastructure development in other areas of Travis County is possible without site-specific mitigation and individual incidental take permits.

One of the sinkhole basins that the SH45 right-of-way traverses is the 50-acre catchment area for Flint Ridge Cave. The SH 45 SW ROW passes within 150 feet of the cave entrance and passes over portions of the known subsurface extent of the cave (see attached map of Flint Ridge surface catchment). The cave provides habitat for rare troglobitic karst invertebrates including *Circurina bandida* and *Rhadine austinica*, both of which are listed as species of concern (SOC) under the Balcones Canyonlands Conservation Plan (BCCP) permit. Potentially other SOC have been observed in Flint Ridge Cave during faunal surveys, including *Eidmannella reclusa* and *Speodesmus N. S.*, although further biological investigation is necessary to distinguish the specific species present in the cave. Because of the presence of these species, Flint Ridge Cave is one of 62 caves that are protected under the BCCP permit. If the BCP is unable to protect these species then future listing as endangered or threatened species by the U.S. Fish and Wildlife Service (USFWS) is a possibility. Importantly, the City and Travis County could also incur fines or other expenses for failure to comply with the BCP permit with a likely scenario being that the permit will require amendment, which, in addition to being a potentially lengthy and costly process, could have implications for private land development and public infrastructure development in a large area of western Travis County.

Until recently the proposed SH45 SW was not obligated to comply with the BCCP permit or the federal Endangered Species Act. This is because the species in Flint Ridge Cave are not currently listed by the federal government as endangered or threatened. However, as noted previously, Travis County, Hays County, and Central Texas Regional Mobility Authority have entered into an agreement to jointly fund the proposed project. Because of this funding agreement, in combination with a 1996

agreement between Travis County and the City to create the BCCP, the proposed project appears to now be a County project that must comply with BCCP permit.

Prior to the initiation of the environmental review process for the proposed SH45 SW the City strongly suggested that TxDOT undertake or agree to participate in a study to better delineate the subsurface drainage area of Flint Ridge Cave. As the study was not included in the scope of work for the environmental review, in early 2014 the City decided to undertake the study on its own, which is being conducted by City personnel with specific expertise in this type of analysis. The study involves the use of dye tracers to map subsurface flow patterns in the vicinity of the cave.

The City's primary interest in conducting the study is to ensure that both the City and Travis County remain fully compliant with the terms and conditions of the BCCP permit. The information to be obtained through the study, in combination with available information about surface drainage patterns, is considered essential to understanding the potential risks posed by implementation of the preferred alternative and it is essential to the identification of strategies to avoid, minimize, and/or mitigate potential adverse impacts from roadway construction and operation. While the DEIS proposes design concepts for the preferred alternative to avoid and minimize impacts to Flint Ridge Cave, the City cannot determine whether those concepts will be sufficient to achieve the very high level of protection that is required for a cave listed in the BCCP permit. It is the City's position, therefore, is that a final EIS and record of decision should be delayed until this information is available and is fully considered and incorporated into the EIS. This should include development of more detailed engineering designs of the proposed impact avoidance measures that are described conceptually in the DEIS.

8.0 Potential Impacts to the Barton Springs Segment of the Edwards Aquifer

The City of Austin has previously expressed and continues to have serious concerns about the potential adverse impacts of the preferred alternative on the quantity and quality of recharge to the Barton Springs Segment of the Edwards Aquifer, and to nearby users of water supply from the aquifer and to endangered species at Barton Springs. While these concerns, which are further described below, are discussed in the DEIS, the City does not believe that the analyses represented in the DEIS are sufficient to support the finding that the preferred alternative can be implemented with minimal impact to the natural environment and with no impact to federally list endangered species. As previously noted, any such determination should be withheld until all geological field investigations are completed, particularly the aforementioned study to determine the subsurface drainage area of Flint Ridge Cave. And more specifically, it is premature to conclude that the proposed "avoidance" measures described in the DEIS can be adequately evaluated and properly designed before the completion of the Flint Ridge Cave study and without quantification of the overall loss of aquifer recharge from implementation of the preferred alternative or without quantification of the pollutant loads for constituents other than Total Suspended Solids (TSS).

Recharge to Barton Springs - Studies have demonstrated that a high percentage of rainfall in the area of the SH45 SW right-of-way directly recharges the Edwards Aquifer. Roughly two-thirds of the 8,300 segment from Mopac South to Bear Creek cross internal sinkhole drainage basins that supply recharge to the Edwards Aquifer. There are at least fourteen identified caves within one-quarter of a mile of the proposed designated right-of-way (ROW). Additionally, the main channel of Bear Creek downstream of the SH45 SW right-of-way contains swallets (creek-channel sinkholes) that directly recharge the aquifer in the range of 10 to 20 cubic feet per second when the creek is flowing. These swallets are prone to plugging by fine-grained sediment, which reduces recharge and could be irreversible. None of this information was specifically incorporated into the DEIS; although it was provided to TxDOT during the Technical Work Group process.

Proximity to Local Public and Private Water Supply Wells - The Barton Springs Zone of the Edwards Aquifer is a designated sole source aquifer under the Federal Safe Drinking Water Act. The SH45 SW right-of-way is also within the City's Drinking Water Protection Zone. There are numerous public and private water supply well systems that lie down-gradient of the right-of-way. Contaminated stormwater runoff has the potential to impact drinking water supplies in portions of Shady Hollow, Copper Hills, SW Territory, and Marbridge Foundation (see attached map of well recovery from 2007 dye tracing). Of note is that the Edwards Aquifer is understood to provide little natural attenuation of contaminants, except by dilution with natural runoff sources (Hauwert, 2009). This information was not considered in determining protective measures outlined in the DEIS.

Federally-Protected Endangered Species - As noted, the City of Austin holds an Incidental Take Permit from the U.S. Fish and Wildlife Service (USFWS) for the endangered Barton Springs Salamander (*Eurycea sosorum*) and for the recently listed Austin Blind Salamander (*Eurycea waterlooensis*). Dye tracer studies performed by the City in the vicinity of the SH45 SW right-of-way have demonstrated a strong hydraulic connection with Barton Springs. Four groundwater tracers injected in the vicinity of the intersection of SH45 SW and Mopac South in 2007 and initially arrived at Barton Springs within two to four days. Long-term monitoring indicates that there has been some decline in water quality in the Barton Springs Zone (Mahler et al., 2006; Herrington et al., 2010; Mahler et al., 2011). Any loss of recharge to the aquifer or degradation of water quality as a result of the proposed project would negatively impact these federally-listed endangered species. Any direct or indirect impacts to listed species or their habitat constitutes "take" under the federal Endangered Species Act, which requires authorization from the U.S. Fish and Wildlife Service.

9.0 Environmental Compliance Management Plan

The City is encouraged by the discussions presented in Appendix H (pp. H-20) of the DEIS with regard to an Environmental Compliance Management Plan (ECMP) for the proposed project. From this discussion it appears that TxDOT/CTRMA has embraced many of the elements of the City's Environmental Commissioning (EC) process for the design, construction, and start-up of Water Treatment Plant No. 4. The City's EC process for the water treatment plant was a topic of discussion in the Technical Work Group and in subsequent meetings with CTRMA staff. However, the discussion of the ECMP in Appendix H of the DEIS is lacking specificity and is missing several critically important elements including:

- Acknowledgement that the ECMP is a process that will be employed throughout the design, construction, and start-up of the project that includes an environmental compliance "team" that is independent of but integrated with the design and construction team;

- Acknowledgement that the environmental compliance team will possess the technical capabilities and expertise required to provide effective independent oversight;

- Clearly defined environmental protection goals and measurable performance standards;

- A clear process for incorporation of environmental protection measures into project design and in construction management;

- Environmental monitoring during and after construction to ensure that environmental performance standards are being met; and

An adaptive management process to adjust project plans when goals and standards are not being met or when unanticipated events or conditions occur.

In addition to incorporation of the above elements into the discussion of the ECMP in Appendix H, the City would like to see this discussion in the body of the DEIS along with a commitment by the implementing agency (i.e., CTRMA) to develop and implement a robust environmental compliance process in collaboration with the City.

10.0 Monitoring, Assessment, and Adaptive Management

If the proposed SH45 SW goes forward it is essential that there be a robust ongoing environmental monitoring, assessment, and adaptive management program with clearly defined goals for environmental protection that will ensure full protection of BCP permit caves, City of Austin Water Quality Protection Lands, and the quality of water in nearby water wells, creeks, and at Barton Springs. The purpose of environmental monitoring and assessment is to detect problems early so that adaptive management responses can be implemented in a timely manner. For example, sediment discharges from the roadway and its appurtenances, particularly during construction, may require alterations in temporary and/or permanent stormwater controls and could require periodic physical removal of accumulated sediment to restore impaired aquifer recharge volume. Similarly, hydrologic and habitat conditions in Flint Ridge Cave will need to be monitored in perpetuity to ensure that the cave is not being adversely impacted by the roadway.

The need for and costs of an ongoing environmental monitoring, assessment, and adaptive management program must be addressed in the final EIS. Additionally, there should be a commitment by the implementing agency (i.e., CTRMA) that all reasonable measures will be taken to rectify any problems that are identified through monitoring and assessment, including modifications to facilities and/or alteration of roadway operations.

City of Austin
Submittal Review Comments
Project Title: SH45
Report: SH45 Draft Environmental Impact Statement
Date: August 13, 2014

No.	Page	Sec.	Review Comments:
1	0	General	There is no reference to or discussion of the 1990 Consent Decree with the Barton Springs Edwards Aquifer Conservation District. The Consent Decree states that the BSEACD will have input on how SH45SW will be built, operated and maintained. There is no proposed mechanism in the DEIS to implement this requirement.
2	0	General	The project is acknowledged to be in an environmentally sensitive area by virtue of overlying the Edwards Aquifer, a karst aquifer system noted as being the most sensitive in the state to pollution by TCEQ and a sole source aquifer. The karst features, which make the aquifer sensitive, included in the DEIS are from work conducted in 2007 and do not include results of the most recent efforts. Results of the most recent karst studies are to be included in the final EIS but that bypasses significant public input as REQUIRED for an EIS.
3	0	General	In the area of Flint Ridge Cave the road profiles show the road on up to 20 ft of fill. This amount of fill raises the roadway above tree line in many places. The amount of fill should be reduced significantly by reducing proposed highway speed to reduce curvature values or elevating the multiuse path instead of the roadway. COA constructed a number of visual cross sections which indicate that the road, despite being relatively distant, will be highly visible from adjacent neighborhoods.
4	0	General	Will the roadway have lighting? If so how tall will the light poles be? Any lights used should be focused entirely downward to reduce light pollution.
5	0	General	There is a major problem with the references in the DEIS. The reference format in Section 8 makes it difficult to locate a specific reference, many examples of references that do not support the statements they follow, or the DEIS interpretation of the reference is totally incorrect.
6	0	General	This document contains abundant usage of conditional wording which is misleading. Words like "should" and "would" should be replaced by action verbs such as "shall" and "will" so that the reader can be assured that CTRMA/TxDoT is going to do what is stated. This is necessary to determine what is an need versus a commitment.
7	0	General	Given the MOU between TxDOT and the Texas Commission on Environmental Quality (TCEQ) 43 TAC 2.305 it is not clear why TCEQ was not invited to be a "coordinating agency" in the DEIS preparation. This would have given TCEQ a chance to work more closely with TxDOT and CTRMA in preparation of the DEIS and have more of an impact on the project than simply being another "participating" agency. This would seem to be a requirement of the MOU in 2.305(b)(2)(B) since TCEQ has "jurisdiction by law" over the project via the Edwards Aquifer Rules 30 TAC 213.
8	0	General	Given their expertise in the subject area, jurisdiction by law and MOU with TxDOT, it is also unclear why the Texas Parks and Wildlife Department (TPWD) was not invited to be a "coordinating agency". The MOU in 43 TAC 2.206 would also seem to provide triggers for special coordination on the project with TPWD.
9	ES-11	ES.5	It is stated that impacts to geologic resources as a result of the Build Alternative are anticipated to be minor, but that additional karst investigations are currently underway. It is not possible to assess the potential impacts on geologic and karst resources until these investigations are completed.
10	ES-12	ES.5	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft contour intervals (versus 2 ft used by the TxDoT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the DEIS.
11	ES-12	ES.5	It is stated that 5.6 acres of Flint Ridge surface catchment will be covered by impervious surfaces but does not note how many acres of the catchment will be disturbed or diverted by the east side berm.
12	ES-12	ES.5	Text does not acknowledge that part of the cave underlies the ROW.

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13	ES-12	ES.5	Direct impacts to the natural environment - do the 47.9 ac of impervious cover include the berm planned to divert polluted runoff away from Flint Ridge Cave, WQ Ponds, and the clay layer planned to be installed to prevent polluted runoff from infiltrating into Flint Ridge Cave?
14	ES-13	ES.6	Substantially is defined in TxDOT guidance for cumulative and indirect impacts. This should be in a glossary. From the TxDOT definition, this conclusion in not supported by the analysis provided. ***Further, surface and groundwater resources in the proposed project's AOI are not anticipated to be substantially adversely affected due to the large amount of preserved WQPLs and the implementation of BMPs. Additionally, several regulations are in place to protect water quality from the effects of induced development, including TCEQ regulations requiring BMPs and preparation of SW3Ps, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the CWA.***
15	ES-13	ES.5	The report references COA ordinances and implies that these and other ordinances would protect the aquifer from future development when most of the area serviced by SH45 is outside COA jurisdiction.
16	ES-13	ES.5	How will discharge of treated runoff into Bear Creek affect overall recharge to the Barton Springs portion of the Edwards Aquifer?
17	ES-13	ES.5	Asserts that WQPL was acquired to mitigate for development that might occur because of SH45. There is no document from the City anywhere that establishes the public purpose of WQPL as mitigation for new development. Instead the public purpose is to preserve water quality and quantity by limiting limit new development over the aquifer by removing land available for development. Any new development associated with SH45 would be adverse to the purpose for WQPL.
18	ES-13	ES.5	Does Last sentence of last paragraph in Water quality section imply that SH45 will be constructed to COA Water Quality standards (implied SOS)?
19	ES-14	ES.5	States there will be no direct impact to threatened and endangered species. However, ROW is within 100M of identified GCWA habitat on the Tabor and Edwards Crossing WQPL tracts. The USFWS standard of indirect effects on GCWA is development and disturbance within 100 meters of nesting birds. There may well be indirect effects to GCWA.
20	ES-14	ES.5	Describes no direct effect to Austin Blind salamander, yet USFWS listing notice describes any impact to critical habitat would be considered take. Since runoff from site flows directly to Barton Springs assertions about WQ effects are questionable. There may be direct effects to ABS.
21	ES-14	ES.5	Describes insignificant changes to WQ due to operations as being mitigated by potential future development in study area. USFWS listing notice does not provide for this.
22	ES-14	ES.5	Vegetation - Does the 159 ac of vegetation impacted vegetation include areas disturbed by berms, bentonite cap, and diversion structure to Flint Ridge Cave?
23	ES-15	ES.5	The No Build Alternative states that it is assumed that all other projects listed in the CAMPO 2035 RTP would be implemented. However, neither the benefits nor impacts of all of these other projects being implemented are analyzed as a part of the No Build alternative.
24	ES-17	ES.6	The technical workgroup meetings were not long enough and did not occur frequently enough to enable participants to provide constructive input to reduce the environmental impact of the project.
25	ES-5	ES.3	The DEIS cites population growth figures for census tracts "surrounding the proposed project area" but does not specify these tracts to allow for verification. There is also a vague reference to a CAMPO forecast for the area without the necessary specificity.

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26	ES-6	ES.4	***Based on the analysis of environmental, social, and economic impacts associated with both the Build and No Build Alternatives, the Build Alternative was identified as the Preferred Alternative for the proposed project. The evaluation of the Build and No Build Alternatives was based on the following criteria.*** The text goes on to provide bullet items of the criteria with no real attempt at analysis using an objective qualitative or quantitative method.;
27	ES-6	ES.4	All alternatives except for the Build in Existing ROW and No Build were discounted. It is not adequate for an Environmental Impact Statement to only review the preferred alternative and a no build alternative.
28	ES-6	ES.4	Summary of Alternatives, Preliminary and Reasonable alternatives - discusses potential impacts to WQPL as reasoning to exclude potential alternatives. It does not discuss need to acquire land rights on WQPL for berms and additional "Flint Ridge Cave Watershed" and changes to natural surface and subsurface flows to divert un-affected flows into Flint Ridge Cave to replace diverted affected flows from the preferred alternative.
29	ES-7	ES.4	It is misleading to say that the project avoids direct impacts to WQPL since approximately 38 acres of WQPL was purchased for the ROW so WQPL has been impacted.
30	ES-7	ES.4	Preferred alternative cites impacts to preserve lands as reasoning for selecting build alternative as preferred, yet analysis does not speak to effects to preserve land for build alt.
31	ES-8	ES.5	This section states that the City of Austin et al. have stated that the road will have a limited influence on development in the area. Please provide a reference for each agency listed in which that statement is supported. 19.8% of the land in the study area may be developed in the future (see table 3.1-1). This contradicts what has occured due to transportation projects elsewhere in the region.
32	ES-8	ES..5	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Indirect impacts associated with induced growth are not anticipated to be significant under the Build Alternative due to the limited access nature of the rate of growth already occurring in the area (even in the absence of the proposed facility).roadway, the large amount of protected lands in the proposed project's area of influence (AOI – area in which project-related impacts that are removed in time or distance from the proposed project site itself may still occur), and the high rate of growth already occurring in the area (even in the absence of the proposed facility).***
33	ES-8	ES..5	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***The proposed project's influence on development is not anticipated to be significant, especially given the Austin area's high rate of growth overall and within the study area.***
34	ES-8	ES..5	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance***. While induced growth can indirectly impact water quality and groundwater recharge primarily through increased impervious cover, induced growth as a result of the Build Alternative is not anticipated to be significant.***
35	ES-8	ES.5	States that direct project related impacts to land use would not occur. Yet, proposal to divert overland flow will divert runoff from one sub-watershed to another affecting not only the sub-watershed being substituted but also watersheds downslope and subsurface drainage downslope limiting their effectiveness as protected watersheds serving BSEA. The diversion facility would become a direct project related impact and development on WQPL.

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36	ES-9	ES.5	Insert this paragraph first - "the proposed project is in Hays and Travis counties, which is in an area in attainment or unclassifiable for all national ambient air quality standards (NAAQS), including ozone; therefore, the transportation conformity rules do not apply."
37	ES-9	ES.5	Modify this statement - "***A quantitative analysis of air quality impacts resulting from the Build Alternative was not completed for this environmental impact analysis as traffic projections for the design year are 34,400 vehicles per day (vpd), well under the 140,000 vpd threshold for a Traffic Air Quality Analysis.***" To read as - A quantitative analysis of air quality impacts resulting from the Build Alternative was not completed for this environmental impact analysis. Traffic projections for the design year are 34,400 vehicles per day (vpd), well under the 140,000 vpd threshold for a Carbon Monoxide (CO) Traffic Air Quality Analysis.
38	ES-9	ES.5	Rather than stating that the VMT will be slightly higher under the Build Alternative, please provide a percentage to let the reader know how much higher the VMT is expected to be.
39	ES-9	ES.5	A quantitative analysis of air quality impacts was not done because the VMT was under a regulatory threshold for such an analysis. In keeping with the stated TxDOT goal of developing the most environmentally safe project given the sensitivity of the area, such analysis could have shown the superiority of the DEIS rather than business as usual. This is only an example of a common flaw in the DEIS and the inconsistency that is seen throughout the "analyses" in the document.
40	1	1.1	The study area should encompass more area, perhaps even as far east as Manchaca Lane (since the upgrade of Manchaca Road was considered in one of the preliminary alternatives.)
41	1	1.1	Study area should extend to include Slaughter Lane and all of Brodie Lane south of Slaughter Lane
42	1	1.1.1	Question: Will Preferred Alternative project predetermine location/type of improvements within FM 1626 corridor eastward to IH 35? If no, why not? (The extension of SH 45 SW is included in *Hays County Transportation Plan* .)
43	5	1.2	Question: What impact has the purchase of project ROW and deeding to State by Hays & Travis Counties had on the selection of Preferred Alternative (New Tollway on Existing State-owned ROW Alternative)?
44	6	1.4	The purpose and need seems to be based on future travel delays and does not speak to the corridor within a system. It does not quantify the capacity needs, and does not speak to the system and how the roadways to the south are limited. FM 1626 is currently a 2 lane rural roadway, which generally could be upgraded to a 4 lane at-grade roadway. Assuming that there is not a plan to make it a freeway, and that signals will be needed at intersections along the road, the proposed SH 45 has twice the capacity of the linkage to the south. This does not include any potential operations changes to Brodie and Manchaca. If SH 45 is extended to Interstate 35, the full capacity could be used.
45	6	1.4	RTG,2014 formulas and calculations should be in Appendix
46	6	1.4	Please use compound annualized population growth rates in Paragraphs 1 & 2, not simple percentage increases, for both historic and future growth rates.
47	9	1.4	Brodie Lane is classified as a major arterial from US 290 to FM 1626
48	13	1.5	The Other Project Goals do not include reference to the terms of the judgment of the 1990 Consent Decree with the Barton Springs Edwards Aquifer, or discussion that the road will be consistent with the non-degradation requirement of the City of Austin Save Our Springs Ordinance. "Other Project Goals" should include "the preservation of the quality and quantity of recharge to the Edwards Aquifer."

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49	13	1.5	The wording of the TxDOT environmental goals (Other Project-Related Goals, making the appear to be an afterthought) for the project have subtly changed from those discussed at numerous meetings on the project. Rather than a superior project and the most environmentally sensitive roadway designed, it is now to be constructed in a "environmentally sensitive manner that minimizes, to the maximum extent practicable, the potential impacts to the Edwards Aquifer from construction and operation of the roadway". It is clear that the written goals are a far cry from those in previous verbal commitments.
50	13	ES.5	Discussion of census blocks having more than 50% minority population is provided but with no direct citation of these census blocks.
51	13	ES.5	A general dismissal of any potentially negative impacts of the toll without any backup data or reference. The DEIS basically states that there will an annual impact of about $600 without any analysis of how this fee will affect the population of users.
52	13	ES.5	Discussion of census blocks having more than 50% minority population is provided but with no direct citation of these census blocks.
53	15	2.1	Why wasn't a new **non-tolled** roadway on existing state-owned ROW a preliminary alternative?
54	16	2.1.3	Why didn't the ***"upgrade of one or more existing roadways"*** include a consideration of just upgraded arterials?
55	16	2.1.3	State definition of "highway"; if frontage roads are included is highway assumed to be toll or non-toll? State typical total ROW required for 4-lane highway in text after "additional ROW would be required."
56	16	2.1.4	Question/Clarify in second sentence: would this alternative include frontage roads in ROW, in addition to stated main lanes and interchanges?
57	16	2.2.1	Please identify the specific TSM strategies implemented on Brodie Lane, Manchaca Road and Slaughter Lane, and the level of mobility improvement achieved by the strategies prior to conclusion TSM Alternative can not improve system connectivity or offer an alternative route to congested local roadways.
58	17	2.2.3	Why is upgrading to a highway facility with frontage the only alternative? Why not arterial 4-lane or 5-lane cross section?
59	17	2.2.3	The analysis presented removes improvements to Brodie and Manchaca as alternatives because it assumes that grade separated roadways in 300 feet of right-of-way would be needed to handle the need. It is difficult to tell if the need is met, because the need is based on delay and not on balancing system wide capacity. A simple analogy would be there is a 2 inch hose full of water coming north in the morning from Hays County, that feeds two 1 inch hoses (Brodie and Manchaca), and we are now going to build a 4 inch hose to connect to MOPAC. It would reduce the pressure (delay) in the system, but would not increase the capacity of the system. DEIS did not look at combination of improvements to Brodie and Manchaca that could provide the needed capacity. The report just says widen either roadway to a freeway would cause too much disruption to the neighborhoods
60	17	2.2.3	Please evaluate upgrade of Brodie Lane to 4-lane divided arterial with grade separated interchange at Slaughter & Brodie Lanes. Required ROW for MAD 4 is 100 - 120 feet.
61	17	2.2.2	The TDM Alternative discusses one TDM, transit. Please discuss TDM strategies and whether purpose and need can be met by common TDMs (bike, walk, flex schedules, mixed land use activity centers adopted in MPO Plan, alternative schedules, telecommute/tele-technologies). These approaches are mentioned on Page 15, "2.1.2 Travel Demand Management (TDM)".
62	17	2.2.3	Please evaluate upgrade of Manchaca Road to 4-lane divided arterial with grade separated interchange at Slaughter & Manchaca, if warranted. Required ROW for MAD 4 is 100 - 120 feet, less than 300 feet for Alternative eliminated from further consideration. (No additional Slaughter Lane ROW beyond Manchaca at Slaughter intersection/interchange. FM 2304 not in BS-EAR or BS-EAC zones.)

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63	25	2.30	Regarding the underpass for the Violet Crown Trail, will this underpass be large enough for a standard truck to pass through? Maintenance and security for the proposed trail may be hampered if this is not the case.
64	25	2.3	Regarding the underpass for the Violet Crown Trail, this must be located much further north to avoid impacting the Flint Ridge Basin. The trail was always expected to join or cross the SH45 ROW as north as possible and then follow the ROW to where it connects to the trail continuation on the other side of the ROW.
65	25	2.3	APPENDIX C: Safety concerns regarding shared use path (SUP) crossings of turn lanes, connectors, main lanes at intersections/interchanges at S. Loop 1, Bliss Spillar Road, FM 1626. Provide additional details on Schematics in Appendix C and evaluate bicycle, pedestrian, ADA safety at all SUP crossings of Build Alternative.
66	27	2.4	Why is a tolled facility the PA and not a toll free?
67	29	2.4	Figure 2.4-1 does not depict areas outside ROW where runoff from highway will be diverted to and areas outside ROW where runoff will be diverted from to serve Flint Ridge Cave as areas of disturbance from SH45SW.
68	32	3.1.1	There is no COA 2012 reference listed in Section 8
69	32	3.1.1	Mention of Census data on new residential construction within the study area without specific attribution or direct listing of these data.
70	33	3.1.1	Correct Fig. 3.1-1 to show Avana Full Purpose Annexation in southwest Study Area. http://austintexas.gov/department/annexation-extraterritorial-jurisdiction-planning/
71	35	3.1.1	The map shows the entirety of the Grey Rock Ridge Subdivision as residential. The subdivision plan seems to set aside open space that is not shown.
72	35	3.1.1	The map shows a tract in Shady Oaks Estate, section 2 that is south of the neighborhood park as "Developable Land." This tract is a common area used for open space or drainage and probably not developable.\
73	38	3.1	Table 3.1-1 shows different amounts of developable land than listed on page 41.
74	39	3.1.1	*Imagine Austin* , while incorporating adopted Neighborhood Plans, contains the *Imagine Austin* Growth Concept Map. The adopted Growth Concept does make future land use goals and recommendations; please correct third paragraph to reflect content of Concept. ftp://ftp.ci.austin.tx.us/GIS-Data/planning/maps/Fig_4.5_Growth_Concept_Map_24x36-2_Map.jpg Also, revise content of third paragraph to reference Imagine Austin Roadway Networks, Transit Networks, Bicycle & Pedestrian Networks (Figures 4.4, 4.3, 4.2 at http://www.austintexas.gov/department/our-plan-future)
75	39	3.1.1	This section acknowledges WQPL mission and goals but does not speak to the method of removing property from land available for development. This speaks to TxDOT expectation that WQPL will mitigate future development.
76	40	3.1.1	Omitted material. Discuss goals of Travis County draft Land, Water, and Transportation Plan, approved for Public Review & Comment by Travis Co. Commissioners Court, July 1, 2014, Item 14. Access backup here: http://traviscountytx.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=1378&Inline=True
77	41	3.1.1	Omitted material. CAMPO 2030 Plan includes SH 45 SW, FM 1626 - IH 35, Sponsor Hays County, 100% Locally Funded Project. $8.2 million for environmental and preliminary engineering analysis, Open year 2020 - 2025.http://www.campotexas.org/wp-content/uploads/2013/10/CAMPO_2035_Plan_Adopted_May_242010wMods.pdf
78	42	3.1.1	Table 3.1-2: Veritas Academy is Expired as of July 7, 2014

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79	45	3.1.3	If 19.8% of the study area is developable land accessible by the roadway, then encroachment effects are not insignificant and the impact of development of this land should be included in the surface water and groundwater water quality impacts associated with this project.
80	45	3.1.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***The direct impacts to land use associated with the Build Alternative are not expected to be significant. Further, any direct impacts that would occur outside the ROW would be anticipated to be temporary and associated with construction.***
81	45	3.1.2	States that no conversion of land use from non-transportation to transportation use will occur. This is inaccurate as the build alternative includes plans to divert water from outside ROW to Flint Ridge Cave. This should be considered a transportation land use that effects the overall amount of recharge (surface and subsurface).
82	46	3.2.1	DEIS shows Table 3.2.1 and uses data for entire, whole census tracts giving populations and population growth from 1990 to 2000 and then to 2010. The actual study area is a rectilinear polygon and only partially overlaps with the five census tracts. The vast majority of the population growth that occurred form 1990 to 2010 within the set census tracts happened outside of the actual study area. Approximately about 15% of the growth listed on the table occurred within the actual study area. Table 3.2.1 is grossly misleading.
83	56	3.2.1	Using tract-level median household income (MHI) and then stating that no tract's MHI is below the federal poverty level and therefore there are no low income populations is a highly unorthodox way of testing for EJ issues, especially given the fact that in an earlier section the DEIS offers actual poverty rates for the collection of block groups in the area.
84	56	3.2.1	Using tract-level median household income (MHI) and then stating that no tract's MHI is below the federal poverty level and therefore there are no low income populations is a highly unorthodox way of testing for EJ issues, especially given the fact that in an earlier section the DEIS offers actual poverty rates for the collection of block groups in the area.
85	58	3.2.1	Extremely vague references to census data that give information on the number and type and wage rate of jobs within the study area. These must be estimates from a dataset known as Local Employment Dynamics that are produced by the Census Bureau--but this should be clearly attributed as such and not confused with the far more solid population data from the decennial census.
86	63	3.2.1	There appears to be a typo or mistake of some sort as the DEIS states that 91% of the housing stock is occupied (this is correct) and that 91% of these units are owner occupied--the actual figure is closer to 80%.
87	63	3.2.1	The DEIS states that the Shady Hollow CDP overlaps some parts of the City of Austin--this is untrue as CDPs by definition are areas of population concentrations outside of incorporated jurisdictions.
88	63	3.2.1	There is additional confusion about the owner occupancy rate…DEIS states Shady Hollow is 98% owner occupied when in fact the true figure is 93.5%.
89	69	3.2.1	Existing travel patterns to primary destinations; The 41% of all through trips captured destined for MO Pac should be an absolute number, i.e. 41% is XX out of XXXXX
90	74	3.2.1	Table 3.2-9 Daily Traffic Volumes do not match source data
91	77	3.2.2	Clarify if the travel time estimates from the 2035 model included improvements to roadways (eg, MoPac) other than the proposed SH45 SW

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92	78	3.2.2	Inconsistent definitions of low income…earlier sections equate low income with below the poverty level whereas in this section it is defined (more accurately) as 50% of the family population with income at or below 80% of county median or a poverty rate of 25%.
93	82	3.2.2	RTG,2014 formulas and calculations should be in Appendix
94	82	3.2.2	Atkins, 2013 survey data and calculations should be in Appendix
95	82	3.2.3	TxDOT, 2014 Traffic Forecasting Methodology Memorandum should be in Appendix
96	82	3.2.2	Potential Users of the Toll Facility; The 2nd paragraph is misleading by saying 61% of drivers traveling north on FM 1626 use Brodie. From source data; 7,746 vehicles were counted going north at site #2, of those vehicles 1,588 were matched at destination locations, 790 of these vehicles passed through site #2A and #6 on Brodie, i.e. 10% of drivers (790 out of 7,746) traveling north on FM 1626 were matched at cameras on Brodie.
97	82	3.2.2	AASHTO guidance suggest that the following be used for documenting cumulative impacts. The DEIS falls shore of following this guidance. ***Explain the Methodology. Just as important as selecting a reasonable methodology is the importance of clearly explaining why that methodology was selected. The advantages and disadvantages/drawbacks of the methodology should be acknowledged, not ignored. Provide Factual Support. The evaluation of trends and conclusions about environmental consequences should be based on up-to-date factual information. Graphs, tables, and other graphic elements should be incorporated, where appropriate, to aid readability. Use Clear Reasoning. The conclusions of the assessment should be supported by logical analysis and plausible reasoning, and not contain internal inconsistencies or contradictions that put the results into question. It also is important to document the uncertainties involved in the analysis, explain the importance of those uncertainties, and explain how they have been addressed. Legal Sufficiency Criteria. For a more detailed list of factors to consider in assessing the legal sufficiency of indirect effects and cumulative impacts analyses, refer to Appendix 1A (indirect effects) and Appendix 1B (cumulative impacts). These lists also are based on the recommendations in the NCHRP report, Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents (2008)***
98	92	3.3.1	The DEIS notes that additional karst surveys are underway and results will be included in the final EIS. Because this geologic assessment is incomplete, the actual roadway alignment and BMPs necessary to prevent degradation of aquifer recharge quality and quantity cannot be determined. Inclusion in the final EIS does not provide sufficient opportunity for public and participating agency review and comment. Conclusions of the impacts of the project on the Edwards Aquifer in the DEIS are thus incomplete and not valid because of this missing data.
99	101	3.3.1	The surface catchment area shown for Flint Ridge Cave is not accurate, and does not reflect the most current City of Austin analysis of 58 acres (see Hauwert et al. 2014.)

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100	101	3.3.1	The DEIS does not reflect the importance of sub-surface recharge to specific karst features like Flint Ridge Cave or the importance of upland recharge to the Barton Springs Segment of the Edwards Aquifer as previously documented (see for example the Cowan and Hauwert 2013 reference included in the DEIS). Impacts to Flint Ridge Cave and the Edwards Aquifer cannot be accurately assessed without analysis of the loss of upland recharge from the impervious cover associated with the project or the loss of subsurface recharge to features like Flint Ridge. See: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:9
101	101	3.3.1	It appears that many of the citations to karst may not be the current and best available information
102	102	3.3.1	For updated estimates on amount of precipitation that recharges the aquifer, see: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:9
103	103	3.3.2	Impacts on geologic resources are not minor if at least 7 karst features are directly impacted. Surface catchment areas to point recharge features will be impacted by construction activities and paved over by the highway (e.g., Flint Ridge). Impacts to subsurface catchment areas to recharge features are not assessed in the DEIS.
104	103	3.3.2	Impacts to sensitive karst invertebrates are not considered, particularly as a result of Solenopsis invicta (fire ant) or tawny crazy ant invasion as a result of the large amount of soil importation that would be required for highway construction.
105	103	3.3.2	What are the proper techniques that will be used to control erosion during construction
106	103	3.3.2	Asserts that construction BMPs will effectively minimize soil loss. There is no design or specification information available in order to support this determination or evaluate its assertion.
107	103	3.3.2	States no hydric soils are present. However, USACE and EPA recently issued an interpretive rule on Waters of the US. This DEIS does not address whether the project involves waters of the USA regarding Bear Creek.
108	103	3.3.2	States that project will directly impact openings of 7 features. Will it impact the extent of the features, recharge value of these features, and/or water quality of these features. The 1990 BSEACD consent decree should be checked to determined how these new features were to be handled.
109	104	3.3.2	If features are permanently backfilled or covered by impervious surfaces, an equivalent amount of recharge should be added as mitigation for loss of recharge. The surface drainage area of multiple features will be negatively impacted by the roadway. Loss of recharge to the Edwards Aquifer would negatively impact and could constitute take of the federally endangered Barton Springs Salamander and Austin Blind Salamander species. Loss of spring recharge from development including alteration of subsurface flow paths and alteration of drainage areas to karst features is identified as a threat to endanged Austin Blind Salamander (see final rule for listing Austin Blind Salamander, FWS–R2–ES–2012–0035).
110	104	3.3.2	Confirm if the highway will allow for transport of hazardous materials across the recharge zone. Hazardous material spills from roadways are identified as having the potential to cause take of federally endangered Austin Blind Salamander (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035). Identify the BMPs that will be used to prevent hazardous material spills from entering karst features directly, from infiltrating thru the porous friction pavement or entering the aquifer via subsurface infiltration.
111	104	3.3.2	The list of structural stormwater BMPs does not include bioretention or City of Austin Save Our Springs Ordinance compliant stormwater control measures including retention-reirrigation ponds.

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112	104	3.3.2	This section only address particulate pollutants like TSS and does not analyze dissolved pollutants including metals and hydrocarbons. Dissolved pollutants have been documented to be associated with declines in endangered salamander populations, and increase with increasing impervious cover (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035).
113	104	3.3.2	Evaluation of pollutant removal by stormwater structural control measures using a percent removal method is not consistent with the current state of practice. An effluent probability method as advocated by the International BMP Database that utilizes effluent concentration based methods would more accurately evaluate the effectiveness of stormwater BMPs in series. The conclusion that long-term stormwater runoff from the project post-construction would be of higher quality than the current undeveloped condition is patently false and should be removed.
114	104	3.3.2	Quantify the loss of recharge thru direct entry into the affected karst features as well as a result of loss of subsurface infiltration. The claim that there will be no adverse impact to listed species or the aquifer is unsubstantiated.
115	104	3.3.2	Throughout the DEIS there are numerous mentions of importing materials to the site such as …***"Examples of structural BMPs that would be used during project construction include mulch logs…",*** It appears that the DEIS has completely ignored the major threat of introducing invasive species such as the Tawny crazy ant (*Nylanderia fulva*) via the importation of off site materials
116	104	3.3.2	Although contrary to this section, the proposal to treat runoff and dispose off-site will directly affect recharge.
117	104	3.3.2	This section does not speak to direct or indirect impacts to discrete recharge that occurs through karst that is not visible on the surface. It does not at all address the fact that this site is one of the most karst rich areas in all of Travis and Hays Counties.
118	104	3.3.2	Provides no details on water quality measures. Defers to WPAP comment period and provides no opportunity for public review and comment as part of this DEIS process. Another example of where the DEIS is incomplete.
119	104	3.3.2	The current TCEQ guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with TCEQ regulations and guidance.
120	105	3.4	Replace the statement - ***"In 2002, the Austin-Round Rock MSA, consisting of Bastrop, Caldwell, Hays, Travis, and Williamson Counties, voluntarily entered into an Early Action Compact (EAC) with the TCEQ and the Environmental Protection Agency (EPA) to proactively address and implement emission reduction strategies before being designated nonattainment upon promulgation of new eight-hour ozone NAAQS. The Austin-San Marcos area participates in the EPA's eight-hour Ozone (O3) Flex Program and the Austin-Round Rock-San Marcos area participates in the EPA's Ozone Advance Program. Participation in these voluntary programs has resulted in the development and implementation of an emission reduction plan to assure attainment of the eight-hour ozone standard by 2007 and maintenance through 2015.*** " to read as "In January 2014 the Austin-Round Rock MSA, consisting of Bastrop, Caldwell, Hays, Travis and Williamson Counties, entered into the Ozone Advance Action Plan with the TCEQ and EPA. The plan builds on the work of previous plans - the One Hour Ozone Flex Plan (2002), the Early Action Compact State Implementation Plan (2004), and the Eight Hour Ozone Flex Plan (2008) - and is intended to keep the region in attainment of the current ozone standard of 75 parts per billion, reduce ozone levels enough to remain in attainment of anticipated future standards, and improve public health, particularly for vulnerable populations. The Ozone Advance Action Plan is in effect until December 31, 2018." source: background section of Ozone Advance Plan http://www.capcog.org/documents/airquality/OzoneAdvanceOutreach/Austin-Round_Rock_MSA_OAP_Action_Plan.pdf

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121	105	3.4	Replace the statement - ***"Due to the EAC efforts, the Austin-Round Rock area counties were designated in attainment for 8-hour ozone as of July 2012 (TCEQ, 2013).*** " to read as "Due to the efforts of the Clean Air Coalition under the Eight Hour Ozone Flex Plan the Austin-Round Rock MSA was designated in attainment for 8-hour ozone as of July 2012 (TCEQ, 2013).
122	105	3.3.3	Assertion that because of WQPL, impacts from encroachment are insignificant. The correct interpretation is that because WQPL has removed so much areas from development the impact from encroachment is very significant. Fundamental flaw in DEIS reasoning.
123	106	3.4	Modify this statement - "***The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required.*** " to read as "The AADT projections for the proposed project do not exceed 140,000 vpd; therefore a Carbon Monoxide (CO) Traffic Air Quality Analysis was not required.
124	107	3.4	Rather that stating that the VMT will be slightly higher under the Build Alternative, please provide a percentage to let the reader know how much higher the VMT is expected to be.
125	108	3.4	Correct "***Under the each alternative there may be…*** " to "Under each alternative there may be…"
126	115	3.5.2	Does not identify values and effects of noise levels on protected undeveloped property and sensitive wildlife.
127	118	3.5.2	Noise impacts to R8 should receive some sort of mitigation. Additional woody vegetation preservation and protection in the SH45SW ROW between the proposed roadway and the noise receiver should be considered at a minimum, but not as the only intervention.
128	133	3.6.1	DEIS states that karst aquifers have unique hydrogeology that results in aquifers that are highly productive but vulnerable to contamination yet does not include the most recent data on karst features within the ROW to help determine potential impacts of the roadway on the karstic Edwards Aquifer.
129	134	3.6.1	Fig 3.6.1 shows water wells within the project AOI but ignores the well known fact that in karst aquifers, like the Edwards, wells can be impacted quickly that are far (miles) downgradient of the project. This is supported by results from dye tracing in the area of the road project that reached wells miles away within hours. Reference is Hauwert 2013, COA SR-13-01.
130	135	3.6.1	Figure 3.6-1 does not depict the USGS NAWQA well on Edwards Crossing, does not depict the windmill well north of the pond on Tabor, does not depict wells on Weisbart and Yates conservation easements and does not identify springs in Bear Creek on Tabor and on Marbridge.
131	137	3.6.1	The well inventory is incomplete. Barton Springs Edwards Aquifer Conservation District records indicate 150 wells in the area of influence. This section should be re-evaluated to consider all affected wells
132	137	3.6.1	Upland recharge has been identified as an important component of recharge to the Edwards Aquifer, and may be 26% of rainfall in upland areas. See: Hauwert and Sharp. 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration. Journal of Water Resource and Protection 6:9; See: Hauwert. 2009. Groundwater Flow and Recharge within the Barton Springs Segment of the Edwards Aquifer, Southern Travis County and Northern Hays Counties, Texas: Ph.D. Diss., University of Texas at Austin
133	137	3.6.1	Discussion on groundwater recharge needs to include recent work by Cowen and Hauwert (2013) that shows recharge to caves through soils and Hauwert and Sharp (2014) that shows a relatively high percent of rainfall can recharge the aquifer through soils.

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134	137	3.6.1	The study area should be enlarged to reflect well documented fact that water can move very rapidly though a karst aquifer and impact wells miles away quickly.
135	137	3.6.1	The time it takes for water from the general project area is not "estimated" but has been well documented to vary from 2-3 days to weeks. Statement is not clear if it applies to only the project area or the aquifer in general.
136	137	3.6.1	Text does not identify NAQWA well on Edwards Crossing
137	137	3.6.1	This section does not speak to WQ monitoring by COA associated with Bradley settlement. Mapping does not depict these wells.
138	138	3.6.2	As noted in the DEIS with the citation of Herrington and Hiers 2010 (incorrectly cited as 2009), water quality in Barton Springs is degrading over time. This is in spite of the existence of the Edwards Rules, and indicates that the Edwards Rules alone are not sufficient to maintain the quality of Barton Springs discharge.
139	138	3.6.1	The closure of Barton Springs Pool after the Statesman article was focused specifically on PAH's in sediment in the pool and not just about "water quality" in general as the DEIS states. The PAH's in the sediment were later traced to a specific nearby source.
140	138	3.6.1	DEIS should clarify that BSP is only closed after storm events that cause the pool to flood. As currently stated, the DEIS implies that BSP is negatively impacted by everyday storm/rain events requiring closure.
141	140	3.6.2	This section only address particulate pollutants like TSS and does not analyze dissolved pollutants including metals and hydrocarbons that could originate from the project and enter the aquifer thru direct or diffuse recharge. Dissolved pollutants have been documented to be associated with declines in endangered salamander populations, and increase with increasing impervious cover (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035).
142	140	3.6.2	This section does not address the impact of hazardous material spills on the quality of aquifer recharge or potential impacts to endangered salamanders at Barton Springs. Hazardous material spills from roadways are identified as having the potential to cause take of federally endangered Austin Blind Salamander (see final rule for listing of Austin Blind Salamander, FWS–R2–ES–2012–0035). Identify the BMPs that will be used to prevent hazardous material spills from entering karst features directly, from infiltrating thru the porous friction pavement or entering the aquifer via subsurface infiltration.
143	140	3.6.2	What analyses were conducted to conclude that impacts to aquifer recharge quality and quantity are minimal? No analyses are listed
144	140	3.6.2	Evaluation of pollutant removal by stormwater structural control measures using a percent removal method is no consistent with the current state of practice. An effluent probability method as advocated by the International BMP Database that utilizes effluent concentration based methods would more accurately evaluate the effectiveness of stormwater BMPs in series. The conclusion that long-term stormwater runoff from the project post-construction would be of higher quality than the current undeveloped condition is patently false and should be removed.
145	140	3.6.2	Provide references and calculations for the percent removal of each type of BMP listed to support the claim of achieving 90% TSS removal. Also include removal efficiencies for nutrients and dissolved constituents.
146	140	3.6.2	Describe the void mitigation plan that will be used to address any voids encountered during excavation, trenching, drilling and boring activities.
147	140	3.6.2	TSS in stormwater runoff during construction also has the potential to be a long-term impact as sediment deposited in karst aquifers during low flow periods can be remobilized during subsequent rain events or during periods of high groundwater velocities in the aquifer and migrate to discharge points.

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148	140	3.6.2	DEIS states that the "proposed project would result in negligible impact to the Barton Springs segment of the Edwards Aquifer" without including the most recent karst data to evaluate those impacts or showing data to justify those conclusions.
149	140	3.6.2	Street sweeping is not typically a BMP used for operational highways. Road closures for this purpose would be difficult. The DEIS should provide references and analysis that demonstrate that sweeping is effective for maintaining the water quality function of pervious pavement.
150	140	3.6.2	Is the multiuse trail included in the calculation of impervious cover? It would be very helpful if the DEIS explained how impervious was calculated for the roadway.
151	140	3.6.2	Does not speak to changes in upland groundwater recharge from installations of berm to divert runoff to treatment and Bear Cr, direct impacts to recharge from installation of bentonite cap, and effects from installation of diversion to divert new flows to Flint Ridge Cave that will decrease levels of dilution.
152	141	3.6.2	More details are necessary about the Environmental Compliance Plan. Will the plan manager be independent of the contractor, and have stop work authority? How frequently will BMPs be inspected? What are the water quality guidelines that will be used for assessment?
153	141	3.6.2	Additional construction impacts not considered are the importation of fill material. Will fill material nutrient content match soil nutrient content of existing native soils?
154	141	3.6.2	DEIS should indicate what BMPs were used during the construction of existing SH45 where Barrett et al, 1995b detected increases in some pollutants.
155	141	3.6.2	Since concentrations of pollutants are presented in other sections of the DEIS they should also be presented here during discussions of pollutants in runoff during the construction of the existing SH45.
156	141	3.6.2	A study of pollutants on rooftops adjacent to MoPac north of the Colorado River found significant atmospheric deposition of PAHs, arsenic, chromium, and copper over 300 ft from the road surface (Mahler and Van Metre, 2003). Since 38 acres of the land for the ROW was purchase from blocks of land acquired for water quality protection and adjacent land still has that purpose, the DEIS should address impacts from airborne pollutants from the highway on these lands.
157	141	3.6.2	It is encouraging to see the inclusion of the on-site full-time environmental compliance manager for this project. However, unless this manager is allowed and encouraged to enforce compliance and impose penalties on contractors the ECM will have little, if any, leverage over highway contractors.
158	141	3.6.2	More information is needed to evaluate the drill shafts including, number, location and width.
159	141	3.6.2	The void evaluation criteria referred to in Appendix H does not follow current TCEQ guidelines. Given the sensitivity of this project, measures above and beyond TCEQ guidelines should be conducted, including downhole camera surveys of all shafts and piers.
160	141	3.6.2	Refueling and storage of vehicles is reported to not be done in the 100 year floodplain to avoid contamination through drill holes, however, if this is done over the recharge zone these risks are still present. Leak collection, using liners (and collecting any leaks collected on a regular basis) under parking and refueling areas would help reduce these risks, but additional BMPs should be considered.

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161	141	3.6	Referenced Text: "***BMPs would be utilized to prevent, reduce, or capture and treat runoff from the proposed project site in order to minimize impacts to water quality from erosion and sedimentation. TxDOT and the Mobility Authority would utilize appropriate temporary, construction-phase BMPs to treat runoff from the proposed roadway and minimize impacts to water quality. These BMPs would provide for up-gradient overland flow prevention, slope stabilization, and on-site sediment retention.***" - Case studies of current highway construction in association with TXDOT in the Austin area demonstrate that the aforementioned approaches are not practiced and that off-site discharge are frequent occurences (see attached photos). All of the tools and approaches that are catalogued in 3.6.2 and Appendix H (A.2) are and have been available for use by TXDOT on current and past projects, yet they have not been regularly or adequately employed. COA has a catalog of photos from 2013 and 2014 to document current state of practice on TXDOT highway projects. As an agency, TXDOT primarily uses standard details of various erosion and sedimentation (E&S)BMPs in the plan sets (see Appendix H, Attachment 1). There is little to no design layout of the E&S measures on the plan set, nor are there systematic designs for the entire site, including the need for phasing or adaptation to changing conditions. The implementation of highway construction E&S controls is left to the contractor on TXDOT projects. Contractors are not typically certified or educated in appropriate layout of E&S controls. They are also driven to install the minimum controls necessary to save on expenditures and maximize profit. Additionally, TXDOT contract documents do not contain performance specifications (e.g. all controls shall contain runoff from 2-year storm; effluent concentrations shall be xx mg/l from the construction site). TXDOT has limited inspection capabilities to ensure compliance with the E&S plans or with TCEQ/SWPPP requirements. Given the lack of up front design and the lack of any system performance standards, an inspection that occurs does not have a benchmark to determine compliance. Rather, it is left to other agencies to document sediment discharges and failed or inadequate E&S controls, bring this to TXDOT's attention, ask TXDOT to employ more robust controls, then monitor the performance of those controls. This seems to have been the historic model on TXDOT highway projects. The DEIS does not describe a process for design, installation and monitoring of temporary and permanent water quality controls that demonstrates that controls will be adequate for this project and provide results different than current and past TXDOT projects in the area. General references to an Environmental Compliance Management Plan does not provide details necessary to demonstrate this can or will happen. This report should have detailed the process, goals, and components of the referenced Environmental Compliance plan in order for the EIS.
162	142	3.6.2	Simply evaluating voids based on investigation criteria does not guarantee that there will be no impacts.
163	142	3.6.2	Calculations of the TSS in runoff should also include what the loads are as well.
164	142	3.6.2	Page 141 references the Barrett et al 1995d study as being conducted during construction, Table 3.6.2 should clarify if the highways runoff values are during construction or operation of the highway.

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165	143	3.6	Referenced Text: "***Table 3.6-3"*** - This table demonstrates the increases in pollutants other than TSS for highway runoff. Since TCEQ pond sizing procedures are only geared towards TSS removal, and the stated design goal is to exceed 90% TSS load reduction, it should be quantified how much additional loading will occur for the other pollutants of concern, particularly Total Phosphorus, Total Nitrogen, Oil and Grease, COD, e coli and Zinc or Lead. As noted in Table 5.1-1 and in the City of Austin Environmental Criteria Manual, 1.6.5 C, the removal efficiency of BMPs for constituents other than TSS is significantly lower than TSS removal. And in the case of Nitrites and Nitrates, a local study (Barrett, 2010) showed the pond to export Nitrites and Nitrate. Please quantify the effective loading of all the pollutants shown in Table 5.1-1. At the very least, quantify loading for Total Phosphorus, Total Nitrogen and Lead. Since TCEQ equations were not designed for load removal for pollutants other then TSS, please cite the methodology used to quantify loading, preferably a method that explicitly accounts for actual pond volume, contributing drainage area, orifice size and drawdown time and effluent concentrations on an average annual basis.
166	145	3.6.2	What is the removal mechanism for dissolved pollutants in porous pavement? Dissolved contaminants that infiltrate thru the porous pavement will recharge the aquifer with minimal attenuation by soil.
167	145	3.6.2	The DEIS cites Driscoll et al. 1990 as stating that surrounding land use is the most important general factor influencing highway pollutant loads. No such analysis exists in the cited reference supporting that claim. The report specifically states "The site characteristics used in the evaluation procedure include information on drainage areas, area rainfall characteristics, the concentrations of pollutants in the highway runoff, the fraction of the total pollutant concentration that is in soluble form, and finally, the target receiving water concentration (against which the concentration produced by the highway runoff will be compared)." That citation does include procedures for estimating the impact of highway runoff on water quality. Please follow the procedures outlined in this reference for evaluating the potential impact to groundwater and surface water resources in the study area.
168	145	3.6.2	No quantitative analysis is presented to validate the claim that there will be minimal impacts on the quantity and quality of groundwater recharge from the proposed project. Comparisons of percent impervious cover for the proposed project (which is higher than allowed by City of Austin Save Our Springs Ordinance requirements) to watershed levels of impervious cover are not an appropriate method to evaluate localized impacts to receiving waters and do not evaluate cumulative effects of impervious cover addition. The DEIS specifically states "While the general percentage of impervious cover within a watershed can be helpful in estimating effects of urbanization on the watershed, a more thorough examination of where impervious cover occurs and what other threats to water quality are present is necessary to fully determine effects on aquatic ecosystems (USFWS, 2013)."
169	145	3.6.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. T***hese protected lands are not expected to significantly contribute to pollutants in stormwater runoff.***
170	145	3.6.2	The DEIS mentions in several places the high removal rates of PFC pavement, particularly of TSS, but there is no discussion of the effective life of the pavement regarding TSS removal.
171	145	3.6.2	The current TCEQ guidance for compliance with the Edwards Aquifer rules notes that PFC pavement is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed PFC pavement will comply with TCEQ regulations and guidance.
172	146	3.6.2	Cite the specific percent removal estimates of the proposed project BMPs for each of the pollutants (and concentrations) listed in Table 3.6-3, or otherwise provide references that TSS is a more protective surrogate than any of these pollutants such that only TSS removal needs to be calculated to evaluate impacts.

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173	146	3.6.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***All ten pollutants were observed in runoff from the undeveloped watersheds, and six of these pollutants (including TSS and total organic carbon) were found at concentrations that were not significantly different from concentrations in runoff from developed watersheds. This study demonstrated that there are naturally occurring pollutants that may naturally recharge into the Edwards Aquifer through stormwater.***
174	147	3.6.2	The DEIS discusses the proposed project in terms of impervious cover the project would create but compares that value to the impervious cover in entire watersheds. As a rule, the amount of impervious cover for a construction project is a percentage of the land as net site area the project is constructed on. In this case, the only comparison of impervious cover should be the pavement or other impervious surfaces within the state-owned ROW (referenced as around 24%). It is not clear if that percentage includes water quality ponds and other impervious surfaces.
175	151	3.6.2	Are the percent removal efficiencies for the proposed BMPs applicable for both construction and post-construction activities?
176	151	3.6.2	The pollutant removal calculations used for TSS do not consider any bypass flow or bypass load. What is the load of TSS that will be bypassed around the proposed BMPs? What design storm was used to evaluate the percent removal of BMPs?
177	151	3.6.2	***"…The proposed roadway would be constructed on fill to limit natural ground disturbance,…"*** Although fill does not necessarily disturb soil per se, large amounts of fill as proposed can significantly alter natural groundwater and surface hydrology. This is another example of imported materials that have the potential to introduce invasive species. The DEIS should provide a more thorough evaluation of the impacts of fill placement.
178	151	3.6	Referenced Text : ***"In accordance with the Edwards Aquifer Rules regulating construction over the Recharge Zone, permanent BMPs and measures must be designed, constructed, operated, and maintained to ensure that 80 percent of the incremental increase in the annual mass loading of TSS from the site caused by the proposed project would be removed."*** - Previous discussions with TXDOT and CTRMA indicated that the agencies would be committed to implementing non-degradation standards for construction and post construction water quality. Previous conversations with the Technical Working Group defined the goal of nondegradation as no net increase in the average annual loading of pollutants as regulated in the City of Austin's Save our Springs Ordinance. The report does not acknowledge this commitment and instead states that Edwards Aquifer Rules are used to demonstrate water quality impacts, but that 90% TSS removal rates would be used instead of 80%. There is no statement of design goals for the control of the other stormwater pollutants that are acknowledge to be generated from this project. Please reconfirm commitment to non-degradation standards.
179	152	3.6.2	Explain what "batch" detention ponds are.
180	153	3.6.2	TCEQ 2012 Guidance for permeable friction course states that the 90% removal of TSS is only applicable when posted speeds are more than 50 mph. What is the posted speed of the roadway?
181	153	3.6.2	TCEQ 2012 Guidance as cited specifies that permeable friction pavement requires "milling and replacement of the overlay at regular intervals, which entails significant expense." What is the planned maintenance program for the permeable friction course, and what is the planned replacement frequency for the proposed permeable friction course to ensure continued removal of pollutants over time? Are there plans for monitoring the performance of the pavement for water quality treatment and defining triggers for maintenance of the pavement?

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182	153	3.6.2	TCEQ 2012 Guidance as cited specifies that sand may not be used for de-icing, but de-icing salts may be used. How will the highway be operated during freezing conditions? Have de-icing salts and other chemicals been evaluated for potential surface water and groundwater impacts from the proposed project?
183	153	3.6.2	Assumptions used for background level TSS on undeveloped WQPL are questionable and should be explained.
184	154	3.6.2	Provide examples of greenfield road projects that have reduced TSS and other pollutant loads over undeveloped existing conditions to validate the claim that the proposed project will improve water quality. Also, it is not clear that the pollutant load analysis includes bypassed stormwater volumes in pollutant discharge analysis. Bypassed volumes are probably the most significant source of pollutant discharges from the project.
185	154	3.6.2	The DEIS discusses that SH45 will have steep cross slopes which it anticipates would allow some stormwater to runoff the PFC surface thus reducing its effectiveness in TSS removal yet the DEIS touts the use of PFC pavement on page 145 without mentioning this limitation. The DEIS should evaluate the decreased effectiveness of cross slopes and adjust project efficiencies accordingly.
186	154	3.6.2	TSS is reported to be captured in pore spaces of the PFC pavement, however, at some point in time all pore spaces MUST be occupied thus rejecting any additional TSS. This means the TSS reduction associated with the PFC pavement has a limited lifespan of effectiveness and TSS will be expected to increase once this occurs. TSS is supposed to be removed for the lifetime of the roadway and this would appear to be in conflict with that requirement.
187	156	3.6.2	Percent removal for constituents other than TSS are frequently lower than 90% as shown in Table 3.6-7. No pollutant load calculations from the project are shown for constituents other than TSS. As such, the statement that "the analyses indicate that the proposed project would have a negligible impact on groundwater quality in the Barton Springs segment of the Edwards Aquifer" is not valid. Calculate loads for all constituents listed in Table 3.6-7 from the proposed project, with and without the proposed BMPs, and compare to aquatic life criteria for the protection of surface water and groundwater biological resources including the Barton Springs Salamander.
188	156	3.6.2	Table 3.6-7 shows pollutant removal estimates lower (less protective) than TSS for many stormwater constituents. As such, use of TSS as a design surrogate is not adequate to support claims that BMPs will mitigate impacts from the proposed project.
189	156	3.6.2	No specifics are provided on how impervious cover is calculated. Does this include: roadway surface, shoulders, WQ ponds and facilities, diversion berms for Flint Ridge Cave, bentonite cap for Flint Ridge Cave?
190	156	3.6.2	The evaluation generalizes impacts in the recharge and transition zones, but fails to identify this site as one of the most karst rich, and therefore, one of the most recharge intense sites in all of the Barton Springs Zone. It fails to factor the relative importance of this site compared to other less significant recharge sites.
191	157	3.6.2	Temporary and permanent loss of recharge will occur as a result of the 4 karst features permanently filled as stated, or with loss of surface drainage area, or with loss of subsurface catchment area as a result of the project. What volume of recharge will be lost a result of the project to ensure that no take of endangered salamander species occurs?
192	157	3.6.2	Comparison of impervious cover from the proposed project to impervious cover of the entire recharge zone is not an appropriate method to validate a lack of impacts. What is the volume of infiltration that will be added as a result of the water quality BMPs as stated? Will water quality ponds be unlined and allow infiltration?
193	157	3.6.2	The TCEQ Edwards Aquifer Rules are not intended to be "non-degradation" and simply following them does not result in non-degradation.

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194	157	3.6.2	Clarify where the 17.2 acres of impervious cover within state-owned ROW are. This value is not consistent with the values presented on page 147 and creates confusion as to what is being referred to.
195	158	3.6.2	No complete and valid assessment of the impact of the project can be completed without a completed karst survey and geological assessment.
196	158	3.6.2	The DEIS should supply data to support the statement that "the retention of stormwater runoff and gradual release form water quality ponds may allow for greater recharge to the Edwards Aquifer" or remove the unsupported statement.
197	158	3.6.2	The DEIS states that BMPs would maintain the flow to naturally occurring sensitive features to the extent practicable but then only mentions that the amount of (surface) water draining to Flint Ridge would be maintained. Since the DEIS does not contain the most recent karst data impacts on surface drainage to other karst features can not be determined. However, COA calculations of the drainage areas cutoff to other karst features indicate a significant reduction in area draining to features such as Hat Sink, Jubilee Sink, F29 and F136.
198	158	3.6.2	In addition, the DEIS does not address the potential loss of recharge from infiltrating rainwater to the karst groundwater system. A COA-funded study is currently underway to help define the subsurface catchment of Flint Ridge Cave.
199	158	3.6.2	The DEIS does not address the fact that a portion of the roadway overlies the Flint Ridge Cave system and what potential impacts that might have.
200	158	3.6.2	States that recharge will still occur after treatment. Previous text describes that runoff in some cases will be treated, then diverted off site to avoid sensitive karst. Will recharge be contributing to the same flow paths as it would be in the no-build alternative?
201	158	3.6.2	States that some recharge will be enhanced because BMPs will slow velocities. Fails to consider whether installation will destroy discrete recharge sites and negatively impact recharge.
202	158	3.6.2	States that stormwater detention will hold more water onsite to increase opportunity for recharge. No data is provided to compare detention volumes to water holding capacity in the 4' deep soil profile that will be negatively impacted by soil compaction, impervious cover, and diversion of flows.
203	159	3.6.2	Encroachment of impervious cover over the subsurface catchment area of karst features like Flint Ridge Cave will decrease recharge to these features and the aquifer. Specify the volume of recharge lost from diffuse infiltration to Flint Ridge Cave as a result of the project.
204	159	3.6.2	The potential loss of recharge due to sealing seven karst features should be addressed in the DEIS and not another document (sent to TCEQ) that the general public will not be able to review.
205	159	3.6.2	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft contour intervals (versus 2 ft used by the TxDoT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the DEIS.
206	159	3.6.2	The DEIS states that approximately 5.6 acres of the Flint Ridge surface drainage area will be covered with impervious cover but Figure 4.2.1 on page H-29 indicates that 5.6 acres will be removed from the Flint Ridge drainage area but not necessarily covered with impervious cover. Clarification is needed.
207	159	3.6.2	"***…The Build Alternative would be located near Flint Ridge Cave and would result in approximately 13 percent (approximately 5.6 out of approximately 43.8 acres) of the surface catchment basin being covered by impervious surfaces…*** " TXDOT's figure for surface runoff, (43.8 acres) does not match WP's figure of 57.8 based on LIDAR aerial survey and ground truthing immediately after the major flood event of October 31, 2013

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208	159	3.6.2	***"The limits of the berm would extend far enough beyond the cave watershed to ensure that roadway runoff would not enter the cave. To prevent the possible infiltration of untreated roadway stormwater runoff through the soil matrix into Flint Ridge Cave, a bentonite (clay) liner would be installed up-gradient from and adjacent to the berm."*** Since we do not know where the subsurface catchment area is, it's hard to say if this would work, and if so, then it would alter the hydrological regime further drying out the cave, thus negatively impacting the cave fauna
209	159	3.6.2	No design or data is provided to verify their calculation of impact to Flint Ridge Cave.
210	159	3.6.2	Is diversion berm counted as impervious cover (2900" X 17'(est) . 1 acre)? Is bentonite Cap (perhaps another acre) counted? Is impervious cover from stormwater ponds and hazardous material pollution traps counted. No data is provided.
211	159	3.6.2	States that impacts to recharge by destruction of karst will be considered as part of geological assessment. This document previously stated that assessment is not part of this DEIS. There will be no opportunity for public review and comment on this data and the conclusions drawn from it.
212	160	3.6.2	No quantitative analysis validating the preservation of aquifer recharge quality or quantity is presented. No consideration of pollutants other than TSS is presented in evaluating impacts to Barton Springs. Thus, the assertion that Barton Springs will be improved by SH45 SW is not supported. What is the volume of stormwater that will be recharged from the proposed project area, since that is qualitatively compared to Barton Springs discharge?
213	160	3.6.2	How is the distance of the project relative to Barton Springs relevant? What are the attenuation of the contaminants listed in Table 3.6-7 inside the Edwards Aquifer that would support this statement?
214	160	3.6.2	States no springs mapped in project area. A significant spring exists upstream of the dam on Bear Creek on WQPL Tabor tract. Also a significant spring on Bear Creek on Marbridge Ranch exists at southern end of study area. These spring sites are apparent on the Signal Hill and Oak Hill USGS 7.5 minute quads.
215	160	3.6.2	Describes relatively small amount of water recharging from the project area. Again fails to recognize that this has been considered one of the most recharge intense sites in all of the BS Zone.
216	161	3.6.2	Use pumping numbers from the BSEACD Habitat Conservation Plan draft.
217	161	3.6.2	Water stored in ponds is subject to evaporation. Evaluate evaporative losses from ponds to validate the conclusion that there will be no loss of recharge to the aquifer.
218	161	3.6.2	The impacts to groundwater wells cannot be evaluated without evaluating all pollutants of concern, not just TSS, as the pollutant removals of other contaminants are not equivalent to TSS as stated in Table 3.6-7. Pollutant removal rates of constituents other than TSS would not be 90% over the recharge zone as stated. Additionally, hazardous material spills will impact groundwater well users.
219	161	3.6.2	The DEIS should present data on how many public water supply wells are downgradient from the project area. Tracing has already shown that water recharging in the general project area can rapidly reach wells miles downgradient of the project area.
220	161	3.6.2	The project should not rely on dilution of water quality impacts from the project.
221	161	3.6.2	The current TCEQ guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with TCEQ regulations and guidance.

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222	179	3.7.1	The Texas Register 1998 is not a valid citation to support the statement that "TSS is a constituent of stormwater that is often measured as an indicator of overall water quality and is a focus of water quality regulations and performance standards in part because of its correlation to other pollutants that occur as particles (it serves as a surrogate in calculating removal efficiencies), the tendency of hydrophobic pollutants to adsorb to clay and silt particles, and the positive effects that TSS removal has on the removal of other constituent pollutants". That citation was a comment made by TxDOT on the proposed rules. Please provide peer-reviewed references to support each of those contentions. Related comments on the same page of the Texas Register state "[TSS] works well for pollutants that adhere to soil particles, it is a poor measure of the effectiveness of controls to remove nutrients."
223	179	3.7.1	What is the calculated nutrient load to surface water as a result of the proposed project? Dry stormwater controls have limited effectiveness at removing nutrients, with total phosphorus and total nitrogen removal estimated to be 13 to 40 and 10 to 35 percent, respectively. (Stanley, D.W. 1996. Pollutant removal by a stormwater dry detention pond. Water Environment Research 68(6):1076-1083)
224	183	3.7.2	Onion Creek and Bear Creek water quality conditions are summarized in these publications, which are not included in the DEIS: http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=203077 http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=186308
225	184	3.7.2	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable.***
226	184	3.7.2	The text states that "a full-time ECM WOULD ensure strict adherence to environmental commitments..." The text should be reworded to be more affirmative to the commitment of TxDoT and CTRMA to strictly adhere to environmental commitments by rewording to read "a full-time ECM WILL ensure strict adherence...."
227	184	3.7.3	Will the permanent BMPs be installed prior to earthmoving on this project?
228	184	3.7	***Referenced Text: "The proposed aquatic resource protection measures would, if fully implemented, result in negligible impacts to surface and groundwater quality during construction. Staged construction, limited soil disturbance and the preservation of natural vegetation would minimize erosion and decrease the likelihood of sediment discharges."*** - This statement lacks any supporting reference and is contradicted by the current performance of highway construction projects in Austin, Texas. The statements are misleading at best and closer to false. The soil disturbance will not be limited within the LOC, it will be almost complete, and there will most likely be very little if any vegetation preserved in the LOC, therefore resulting in significant erosion and an increased likelihood of sediment discharges. This paragraph should be replaced with a realistic description of the how construction is performed and an acknowledgement that there is a high probability of sediment discharges during construction.

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229	184	3.7	Referenced Text: "***These permanent BMPs would be installed as early as practicable during the construction phase of the proposed project to allow for the temporary detention and treatment of on-site stormwater. Ponds similar in design to those proposed have been shown to reduce TSS levels by 91 percent (Middleton et al., 2006)***." - The proposed sedimentation filtration ponds' performance of 91% removal does not consider construction phase influent concentrations in the removal. At the Technical Work Group meeting at TXDOT on July 25, Carlos Swonke stated that the >90% TSS removal applies equally to construction phase as well as post construction phase. First, % removal is an inappropriate and outdated methodology to characterize BMP performance. The significant increase in TSS concentration that would flow into a BMP will result in a very high concentration-3000 mg/l ("An evaluation of geotextiles for temporary sediment control. Barrett et al,WERF,1998)- of TSS into any BMP and subsequent discharge load of TSS even after 90% removal, assuming the filtration media is not clogged. As noted in TCEQ Edwards Aquifer technical guidance, typical influent concentration for stormwater into a BMP after construction is 170 mg/l. Please change the description to characterize BMP performance based upon influent/effluent concentration and describe the dichotomy between influent and effluent concentrations for construction and post construction phases. Please refer to the following reference : "An evaluation of geotextiles for temporary sediment control." Barrett et al., WERF, 1998 page283-290). Second, published removal efficiency of a BMP (whether it is temporary or permanent) is not sufficient demonstration that the removal efficiency will result a certain load being captured. Without preliminary layout of a system of construction phase BMPs, it is not defensible to claim a load reduction or system removal based upon the efficiency of one or more stand alone BMPs. Additionally, the effluent concentration method should be used to characterize load reductions. Please use 500 mg/l TSS (Barrett et al., 1998) as the published effluent concentration for silt fences when performing load reduction calculations. Please provide appropriate reference for effluent concentrations from other BMPs for the load reduction calculations. Please provide quantification for a theoretical Erosion & Sedimentation plan that: a) demonstrates that 90% of the TSS load generated during construction will be captured by the suite of BMPs; and b) based on the loads that will be generated and leave the site during construction, quantify the effluent concentration of TSS from each BMP , quantify the effluent concentration for the runoff that bypasses the BMPs and then quantify the TSS load in lbs. per year that will leave the site and compare to undeveloped conditions.
230	184	3.7	Referenced Text: "***Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable."*** - This language is overly optimistic. Avoiding off-site discharge is highly unlikely and minimizing sediment discharges has not been demonstrated on area TXDOT projects. All case studies of current highway construction in association with TXDOT demonstrate that the aforementioned approaches are not regularly practiced and that off-site discharge usually occurs. COA has a catalog of photos from 2013 and 2014 to document current state of practice on area state roadways.
231	185	3.7.2	"Design goals" are mentioned in this section, but nowhere in the DEIS are all of the "Design Goals" explicitly enumerated. Please list and describe all of the design goals of the project.
232	185	3.7.2	Pollutant loads bypassing goals are not calculated. What pollutant load will bypass each of the series of stormwater BMPs?

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233	186	3.7.2	TSS values for Onion and Bear Creek are concentrations, not loads. Evaluation of TSS monitoring values available from the LCRA water quality website for Onion Creek below Bear Creek indicate that the calculated 12.8 mg/L TSS concentration from the proposed project would be equivalent to the 95.5 percentile of data. Only one of the 13 monitoring points exceeded 4 mg/L. The reported 23 mg/L is an outlier. The statement that the "The expected 12.8 mg/L TSS concentration shown in Table 3.6-6 is well within the typical range of surface water in streams near the state-owned ROW" is not supported by this data and should be removed.
234	186	3.7.2	COA 2006 reports event mean concentrations for stormwater runoff. The statement that "recommended that an average mean concentration of 153.7 mg/L be used to represent the mean watershed TSS concentration regardless of impervious cover or development condition (COA, 2006)." is not accurate. This is reflective of stormwater runoff concentrations of TSS citywide, not watershed mean concentrations. A more robust monitoring data set from the next upstream Onion Creek monitoring site, 12447, yields a median TSS value of 1.6 mg/L and a maximum value of 6.8 mg/L from the LCRA water quality webpage.
235	186	3.7.2	No assessment of nutrient pollutant loads are provided, or estimates of chloride or sulfate loads which are typically dissolved and poorly removed by sedimentation BMPs. As such, the statement "Based on the level of treatment expected for the proposed system of BMPs, water quality would not be degraded to a point that would jeopardize current use classifications as established by TCEQ." is not valid and should be removed since no general use criteria are evaluated and no nutrient, dissolved oxygen or algae growth impacts are evaluated.
236	186	3.7.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***A 2006 study by COA evaluating stormwater runoff quality and quantity from small watersheds in Austin showed no significant trends in TSS levels associated with impervious cover or development condition, and recommended that an average mean concentration of 153.7 mg/L be used to represent the mean watershed TSS concentration regardless of impervious cover or development condition (COA, 2006).***
237	187	3.7.2	The City of Austin supports the prohibition on the use of pesticides (including herbicides) along the SH45 ROW. This prohibition should be stated in Appendix H and in the mitigation section (6).
238	187	3.7.2	Relationships between TSS and parameters of concern for endangered salamanders is not justification for use of TSS as the sole design surrogate since pollutant removal of other constituents is less than the stated removal of TSS, as shown in Table 3.6-7
239	187	3.7.2	Use of the word "would" makes it sound like TxDoT and CTRMA are conditional on abstaining from the use of pesticides and herbicides for maintenance. Should be changes to "will."
240	188	3.7.2	The statement "Therefore, possible effects of heavy metal constituents would be reduced by the use of BMPs and further diminished by natural chemical processes." is not supported by the preceding text. The concentrations or loads of toxic metals from the proposed project has not been calculated, and thus cannot be evaluated in terms of potential impacts on aquatic life.
241	188	3.7.2	Sulfate would be contributed by the proposed project to adjacent surface waters, sulfate has direct detrimental impacts to aquatic life, and sulfate is assessed for general use in classified segments including Onion Creek. What is the pollutant load of sulfate from the proposed project to receiving surface waters?

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242	188	3.7.2	This section ignores impacts of changes in hydrology to aquatic life (see for example http://www.austintexas.gov/watershed_protection/publications/document.cfm?id=196444). What are the impacts to the hydrology of the receiving water from the proposed project? Will the project result in any additional excess stream power in Bear Creek or other receiving waters?
243	188	3.7.2	The statement "and the chemical processes that limit the availability of heavy metals, the proposed project would not be expected to have a measureable effect on water quality-dependent sensitive aquatic resources such as the Barton Springs or Austin blind salamanders..." is not valid or supported by the analysis presented. Stating that high hardness precludes aquatic life impacts of heavy metals is not valid. Calculate the pollutant loads from the proposed project for metals and compare to aquatic life criteria, or remove this statement.
244	188	3.7.2	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***Sensitive features may serve as conduits to the aquifer below or may serve as habitat to troglobitic species. In each regard, the quality and quantity of the water that reaches these features would be protected to the greatest extent practicable to ensure that the aquifer's water and the potential habitat are protected.***
245	189	3.7.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***The risk of harm to the Barton Springs salamander from potential hazardous material spills associated with the proposed SH 45SW would be reduced to insignificant levels by the capture and detainment capabilities of the proposed HMTs.***
246	189	3.7.2	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge.***
247	190	3.7.3	No discussion of revegetation specifications or methods for disturbed areas is presented. All disturbed areas should be revegetated with species native to the area. The City recommends City of Austin standards specification 609s for revegetation or specify the method that will be used
248	190	3.7.3	Describe the maintenance procedures to be used for the BMPs during construction and post-construction operation.
249	190	3.7.3	Describe environmental monitoring programs that would be used to validate the performance of the proposed BMPs and to ensure no adverse impacts occur as a result of the proposed project. Share monitoring results on a regular basis with the City of Austin.
250	190	3.7.2	How will the effectiveness of BMPS for removing TSS be monitored over time? What is the expected maintenance interval for the BMPs proposed for this project? What actions will be taken if effectiveness is less than 90%?
251	191	3.7.3	The TCEQ 2007 Edwards Rules Optional Enhanced Measures state that streams draining more than 640 acres should have buffers of 300 feet from the stream centerline which should remain free from alteration. What stream buffers will be used by the proposed roadway project relative to Edwards Rules guidance?

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252	191	3.7.3	TCEQ 2007 Edwards Rules Optional Enhanced Measures state "Lack of maintenance can be one of the primary causes of BMP failure". Describe the maintenance plans that will be implemented to ensure continued operation of the proposed BMPs as designed to ensure no adverse impacts from long-term operation of the proposed project.
253	191	3.7.3	This statement is not consistent with the research findings of the cited article "Further research into vegetative control measures such as VFS and grassy swales found that VFS can remove up to 99 percent of TSS and up to 97 percent of metals (Barrett, 2004)". The referenced article specifically concluded " The strips were generally less effective at removing dissolved metals and essentially no change in concentration was observed for nitrogen and phosphorus. Concentrations of organic carbon, dissolved solids, and hardness were observed to increase. " Further, the range of TSS removals for VFS reported by Barrett was -450% to 97%, not 99% as reported and with an overall average of only 24%. Please adjust the text to correctly reflect the citation. Please calculate the pollutant loads for the listed constituents predicted to not be removed or predicted to increase based on this report.
254	191	3.7.3	""little adverse impacts would be expected for all but the most sensitive receiving waters". Please evaluate the sensitivity of the receiving waters and the Edwards Aquifer. Onion and Bear creeks by City of Austin monitoring data are of the highest quality in the Austin area, and the Edwards Aquifer has been described by the Texas Groundwater Protection Committee as the most sensitive aquifer to contamination in Texas. As such, they are sensitive water bodies and would be adversely impacted by highway runoff.
255	191	3.7.3	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***Eleven water quality ponds/hazardous material traps are proposed for the treatment of stormwater throughout the SH 45SW corridor. These permanent BMPs would be installed as early as practicable during the construction of the proposed project to allow for the detention and treatment of on-site stormwater. Staged construction, limited soil disturbance/preservation of natural vegetation, and soil stabilization BMPs would be in place through construction to decrease erosion and ensure that off-site discharge of sediment is minimized to the greatest extent practicable.***
256	191	3.7.3	Text touts the benefits of TSS removal from PFC pavement yet other parts of the DEIS (page 154) indicate that the relatively steep cross slope of the SH45 pavement will reduce its TSS removal benefits.
257	191	3.7.3	DEIS does not address runoff that will infiltrate soils and recharge the aquifer and potentially enter local caves with karst fauna. Rainfall and runoff are known to infiltrate through soils (Hauwert and Sharp, 2014 and Cowen and Hauwert, 2013).
258	191	3.7.3	Again, DEIS does not acknowledge that Flint Ridge Caves runs under part of the highway ROW.
259	191	3.7.3	Previous comments address difference in Flint Ridge surface catchment in DEIS versus determined by COA.
260	191	3.7.3	Use of bentonite to reduce infiltration of runoff through soils is creative and indirectly acknowledges that runoff does infiltrate through soils. However, it does not address how the bentonite will stay hydrated to prevent cracking which would allow runoff to pass through the bentonite layer and into the vadoze zone.

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261	195	3.7.3	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable, as would be the case at Flint Ridge Cave where the state-owned ROW intersects part of the cave's approximately 43.8-acre surface catchment basin.***
262	195	3.7.3	The re-routing of runoff to Flint Ridge Cave appears to consist of a culvert in coordination with the multi use trail. Can it be relocated further south to allow a bigger area (of non-polluted, natural runoff) to be re-routed to Flint Ridge Cave?
263	197	3.7.3	Figure 3.7-7 shows the surface catchment of Flint Ridge Cave . The area is smaller than that determined by COA and the main difference appears to be in the east side of the basin not impacted by the highway. The boundary on the west and north sides appear to be generally similar.
264	197	3.7.3	The DEIS should also examine restoring surface runoff to other karst features impacted by SH45.
265	199	3.7.4	Use of BMPs would reduce the impact of some constituents, potentially including TSS, but not all constituents including nutrients and dissolved contaminants thus resulting in adverse water quality impacts from the proposed project.
266	215	3.8.1	The DEIS reports no observation of oak wilt in the proposed ROW, but there is at least one very large oak wilt center between proposed SH45SW and the Shady Hollow neighborhood.
267	219	3.8.1	Table 3.8-2 states that the Barton Springs and Austin blind salamander have no potential to occur within the study area. Eurycea spp have been found in nearby springs and caves, and though it's still being debated as to what species they are (E sosorum, E nana, or a new species).
268	227	3.8	Data from ongoing biologic surveys of caves on the ROW is not included in this document and therefore the impact of SH45 construction and operation on cave biota cannot be determined. If included at a later date, the document needs to address how that data will be reviewed by interested parties.
269	227	3.8.1	The description of the karst zones on p. 227 and in figure 3.8-3 shows the remapping of Veni's 1992 karst zone 2 as zone 3 for containing listed invertebrate karst species. However, it does not add that Veni (2007) stated " While Zone 2 in the South Travis County and Northern Hays County Karst Fauna regions have now been downgraded to Zone 3, non-listed rare species have been found in the South Travis Karst Fauna Region, and a high potential for rare species exists in the Northern Hays County Karst Fauna Region. Nineteen caves with rare species occur in the Rare Karst Species Zone 1 area in the South Travis County Karst Faunal Region. The study area is also mapped as Karst Zones 1 & 2 on the BCCP detailed maps and will require mitigation if the project utilizes the Balcones Canyonlands Conservation Plan permit to address potential impacts to threatened and endangered species.
270	229	3.8.1	There is a record of *Texella reyesi* for Barker Ranch Cave that is thought to be an error in identification, but has not yet been resolved.

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271	230	3.8	The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.
272	233	3.8.1	Table 3.8-3 For Species of Greatest Conservation Need (SGCN) Stygobromus russelli is confirmed for Flintridge cave (quite abundant in the stream passage and pools). Cave Myotis bat (Myotis velifer) is also confirmed for Flintridge cave as well as several other caves within the study area, however, in recent years the #'s of bats have been in a severe decline.
273	238	3.8.1	The section on the BCP should discuss the 62 caves and the protection that is required by the BCCP permit for them. It also mistakenly states that Travis County, COA, and LCRA are the entities responsible for this regional habitat conservation plan. Travis County and the City of Austin hold the permit and there are multiple partners such as LCRA who manage mitigation lands within the Balcones Canyonlands Preserve.
274	239	3.8	Figure 3.8-4is not current and needs to be updated due to acquisitions of Hudson, Searcy, Spillar golf, and the Ruby Ranch conservation easement. That coverage is available upon request from COA either the Environmental Resources Management Division of Watershed Protection Department or the Wildlands Conservation Division of the Austin Water Utility.
275	241	3.8.1	This statement "Soil studies (Wilding, 1993, 1997) have shown that the Flint Ridge Cave surface drainage basin is relatively impermeable and potential pollutants would be unlikely to impact Barton Springs via surface infiltration…" is not supported by the citations and is invalid. Wilding 1997 is a general review of Brackett soils and is not a site specific evaluation of Flint Ridge Cave or it's surface drainage area. Soils around Flint Ridge Cave have been documented to be permeable, and upland recharge through soil infiltration has been documented (see Hauwert and Sharp 2014. Measuring Autogenic Recharge over a Karst Aquifer Utilizing Eddy Covariance Evapotranspiration in Journal of Water Resource and Protection) and Cowen and Hauwert, 2013.
276	241	3.8	There are numerous inaccuracies in the information presented on Flint Ridge Cave: surface drainage presented is smaller than determined by COA, the COA 2012 references is a short summary of activity and did not "delineate" the subsurface basin for Flint Ridge Cave but simply stated it was greater than 100 acres, the DEIS errors in the observations made during a runoff event at the cave in which the runoff from undeveloped ground was so clear that it states "Note how rocks and vegetation are clearly visible below the surface of the runoff."

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277	241	3.8	For a more thorough discussion of soil characteristics, the DEIS should also reference other reports such as Cowen and Hauwert (2013) that indicate the soil is more permeable than reported by Wilding.
278	241	3.8.1	Soil studies by Wilding (1993, 1997) conflict with Hauwert's recharge data in the Flint Ridge Cave basin that demonstrates the majority of water in the basin recharge diffusely, not just through the discrete cave opening.
279	241	3.8.1	The Flint Ridge Cave subsurface contributing basin is reported as over 100 acres in area, but this area has not been mitigated or addressed elsewhere in the DEIS, only the surface drainage basin. If the work by Wilding (1993, 1997) is being used to reject impacts here, this would be in conflict with other science prepared by Hauwert regarding recharge in this area.
280	241	3.8.1	This determination is supported by a study conducted by Paquin and Hardin that suggests that C. cueva, C. bandida, and C. reyesi may all be variants of a single species (Paquin and Hardin, 2005). The study was conducted by Paquin and Hedin, not Hardin.
281	241	3.8.1	The federal permit for the BCCP requires that the surface and subsurface drainage basins for caves used as mitigation are protected. It also requires the preservation of the ecological integrity of the cave. The subsurface drainage basin of Flint Ridge cave is not yet known. Also, the U.S. Fish and Wildlife Service developed karst preserve design criteria in 2012 which should be reviewed and referenced. USFWS 2012. Karst Preserve Design Recommendations. Austin Ecological Services Field Office, Austin, TX. They require protection of the cave cricket foraging area.
282	241	3.8.1	This section indicates that the surface drainage basin for Flint Ridge Cave has been delineated by topographic survey and covers approximately 43.7 acres. This is not correct, the actual acreage is 57.8 acres.
283	241	3.8.1	The DEIS briefly mentions the fact that Flintridge cave has species of concern (species that the permit attempts to adequately protect in an effort to preempt the need for future listing.) The DEIS does not mention the fact that Flintridge cave is one of 62 karst features that the BCCP permit is tasked with protecting. According to the latest FWS Karst preserve Design Recommendations (U.S. Fish and Wildlife Service. 2012. Karst Preserve Design Recommendations. Austin Ecological Services Field Office, Austin, TX.), the surface, subsurface, cave footprint and cave cricket foraging area should be protected. If SH 45 SW is built and the cave environmental integrity is not protected, this may prompt the listing of the species of concern.
284	242	3.8.2	No analysis of the impacts as a result of highway lighting at night are included in this section. Impacts to existing unlit conditions as a result of the proposed project should be included in the assessment of wildlife impacts.
285	242	3.8	Can not locate the Wilding 2007 reference. The Wilding 1997 reference does not support statement in DEIS. Source of the sediment contribution mass can not be verified.
286	244	3.8.2	No discussion of impacts to deer population as a result of vehicle collisions is presented in this section.
287	244	3.8.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Fish species would not be significantly impacted by the proposed project. Bear Creek, the only water body indicated on published maps as being perennial in the proposed project area (though it has been observed to be intermittent with perennial pools), would be bridged to avoid or minimize impacts to the creek and wildlife species in the creek.***

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288	246	3.8.1	Table 3.8-5 states that there is no take for the Barton Springs Salamander Eurycea spp have been found in nearby springs and caves, and though it's still being debated as to what species they are (E sosorum, E nana, or a new species.)
289	246	3.8.2	Table 3.8-5 states that there will be no take of Austin Blind Salamander, however karst and groundwater studies that would be necessary to support this statement are not yet completed.
290	246	3.8.2	Table 3.8-5 states that there will be no take of Barton Springs Salamander, however karst and groundwater studies that would be necessary to verify this are not yet completed.
291	249	3.8	Table 3.8-5 - The table states that no take of GCWAs will occur from the proposed SH45. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas. Also, indirect effects could occur to GCWAs adjacent to the ROW.
292	249	3.8.2	Table 3.8-5 states that there will be no take of listed endangered karst invertebrates however karst investigations are still underway.
293	249	3.8.2	Table 3.8-5 states that there is no suitable habitat within the ROW and no take of the golden-cheeked warbler based on SWCA 2014. However previous studies by SWCA and others have documented suitable habitat and golden-cheeked warblers within 300 feet of the ROW and this information was provided to TXDOT. The ROW and portions of the study area are also mapped as Zones 1 and 2 on the BCCP golden-cheeked warbler habitat maps. These areas require mitigation for take of habitat even if golden-cheeked warblers have not been documented.
294	251	3.8.2	Impacts to the quantity of water recharging the Edwards Aquifer would constitute take of endangered salamanders. The proposed project will reduce diffuse recharge as a result of increased impervious cover, reduce diffuse recharge thru subsurface connections to known karst features, and will directly impact the surface catchment areas of known karst features. Comparison of the total impervious cover of the proposed project to the impervious cover for the entirety of the recharge zone is not a valid method to conclude no take of the effected species unless documentation of previous similar actions by the US Fish and Wildlife Service can be referenced. As defined by the endangered species act, an action that directly or indirectly impacts endangered species or their habitat constitutes take and requires consultation and approval from the US Fish and Wildlife Service.
295	251	3.8.2	Observations of Texella reyesi has not been dismissed, the work looking into this question is ongoing

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296	251	3.8	The draft EIS states that SWCA observed GCWA habitat within the ROW and GCWAs adjacent to the ROW in 2013. Acreage estimates and number of GCWAs observed prior to 2014 should be presented, along with a map of the locations. The draft then states that the same consulting firm did not observe habitat or GCWAs in 2014. The change in habitat conditions from 2013 to 2014 should be explained. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.
297	251	3.8.2	It is stated here that SWCA documented habitat sharing the basic characteristics of golden-cheeked warbler habitat in 2013 and that GCWA's have been observed immediately adjacent to the ROW, but goes on to state that there is no take. This is inaccurate.
298	254	3.8.2	The COA 2011 reference does not appear to address the statement in the DEIS. The statement in the DEIS appears to be another misstatement from the COA 2012 summary report that actually states that the runoff into the cave was clear enough to see rocks and other debris on the ground through the runoff.
299	254	3.8.2	How will the maintenance of the 2900 ft berm and bentonite liner routing roadway runoff away from Flint Ridge Cave be managed over the lifetime of the project?
300	254	3.8.1	Regarding impacts to the hydrology of Flint Ridge Cave, this only addresses the surface drainage issues, does not touch impacts to the subsurface drainage basin
301	254	3.8.2	States that rare karst invertebrates are not expected to occur within the state-owned ROW. This is inaccurate.
302	254	3.8.2	This section briefly discusses potential impacts on Flint Ridge Cave related to water quantity and quality, but does not address impacts related to the cave cricket foraging area, vegetation and nutrient impacts, introduction of invasive species and changes in the cave microclimate.

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303	255	3.8	Several recent peer-reviewed studies with large sample sizes of color-banded GCWAs and GCWA nest monitoring clearly show negative effects of edge on GCWA density and reproductive success, including Peak and Thompson 2013 (not included in the citations), Peak 2007, and Reidy et al. 2009. The draft EIS cites other studies "reportedly showing no significant effects from edge habitat." Coldren 1998 is one of the studies cited; however, Coldren's dissertation found "positive relationships of patch size with pairing success and reproductive success.... Reproductive success was greatest in territories farther than 100 m from edge....Territorial placement within a patch appeared to be influenced by adjacent land uses, with warblers selecting agriculture and grasslands as the nearest land use, and selecting against commercial development, entertainment, forested non-warbler habitat, and high-density transportation...Distance to the edge and territory size were greatest for territories closest to land uses with the highest levels of human disturbance." The draft EIS also cites Kroll 1980 as finding no significant effects from edge. According to the 1992 GCWA recovery plan (not included in the citations), the number of GCWAs on Kroll's study site were reduced from 24-28 territories to 5 territories in 1991 following extensive cutting of the oak-juniper woodlands into narrow strips. This information suggests Kroll's study site did experience negative effects from edge and is consistent with the findings of Peak 2007, Reidy et al. 2009, and Peak and Thompson 2013. Citations: U.S. Fish and Wildlife Service. 1992. Golden-cheeked Warbler Recovery Plan. Albuquerque, New Mexico. 88 pp.; Peak, R. and F.R. Thompson. 2013. Amount and type of forest cover and edge are important predictors of Golden-cheeked Warbler density. The Condor 115(3):659-668.
304	255	3.8	We were unable to find a copy of the Horne and Anders 2001 annual report for Fort Hood. The draft EIS should rely on peer-reviewed scientific literature; if grey literature is cited, it should be readily available to the public. We do have a copy of an annual report by Horne in 2000, which found that "openings as narrow as 10-20 m may result in loss of breeding habitat for golden-cheeked warblers." This would appear to contradict the findings of no significant effects of edge as reported in the draft EIS. Further, the peer-reviewed findings of Peak 2007 and Peak and Thompson 2013 should supersede the earlier findings presented in annual reports for Fort Hood.
305	255	3.8	The draft EIS seems to suggest that the LCRA utility easement provides a sufficient buffer against indirect effects of the proposed SH45. This appears to assume that all edges have the same effects. However, Coldren 1998 found that GCWAs select agriculture and grassland edges and against high-density transportation and other edges with high levels of human disturbance. Sperry 2007 also found that GCWAs were detected with greatest frequency along a utility easement compared with a housing development and woodland meadows. Based on the best available information, the proposed SH45 can be expected to have greater impacts on the GCWA and its habitat than the existing LCRA utility easement.
306	255	3.8	The draft EIS states that ***"predation does not appear to be a major process affecting the presence of warblers or the relationship between nearby land uses and patch size"*** based on a report by Arnold et al. 1996. This study used artificial nests, which are not necessarily representative of actual nest predation. In contrast, Peak 2007 and Reidy et al. 2009 are peer-reviewed publications based on relatively large sample sizes of GCWA nests and color-banded individuals, so are more appropriate to cite in the draft EIS.

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307	255	3.8	The draft EIS cites studies that appear to show little to no effect of road construction and road noise on GCWA densities or reproductive success. However, Benson 1995 and Lackey et al. 2011 were not based on monitoring of color-banded individuals or GCWA nests, which would provide more compelling conclusions. Further, the Vickery method used to determine reproductive success in Lackey et al. 2011 is a reproductive index based on behavioral observations rather than nest fate and was developed for grassland birds. Morgan et al. 2012 found that although the Vickery method "may function as a coarse indicator of habitat suitability (e.g., documenting production in potential ecological traps), in our study the index exhibited neither internal consistency nor the ability to predict nest fate at the plot or territory level and functioned poorly as a substitute for nest searching and monitoring." The reliability of the Vickery method also needs to be field tested on woodland birds such as the GCWA. Based on preliminary data from the Balcones Canyonlands Preserve, we have found that the Vickery method does not provide reliable productivity data compared with color-banding and nest monitoring. Color-banded individuals would also provide more accurate data on territory size and placement, as well as age structure and population turnover. GCWAs tend to exhibit high site fidelity, so it would be helpful to know whether this holds true for areas along the roadway corridors as well. Citation: Morgan, M. R., C. Norment, and M. C. Runge. 2012. Evaluation of a reproductive index for estimating productivity of grassland breeding birds. Auk 127:86–93.
308	256	3.8.3	No suitable habitat for GCWA is reported to be within 300ft of the proposed project, but this is in conflict with the SWCA (2013) report on GCWA habitat on the WQPL which shows habitat for this species within 300 ft. This document was provided to TXDOT and is in the references section (Section 8)on page 343 of the DEIS.
309	256	3.8	We were unable to find a copy of the Pruett et al. 2014 annual report for Texas A&M. The draft EIS should rely on peer-reviewed scientific literature; if grey literature is cited, it should be readily available to the public. We were able to find a 2013 report by Pruett et al., which appears to have a similar study design as Lackey et al. 2011, but includes a small number of color-banded individuals and GCWA nests. Preliminary findings suggest higher density in the control site, and the map of GCWA territories and nests suggest avoidance of the roadways.
310	256	3.8	The draft EIS states that there is no suitable GCWA habitat within 300 feet of the ROW. Also, the majority of the proposed SH45 ROW is within Travis County, and over half of the ROW falls within the Balcones Canyonlands Conservation Plan's Zone 2 GCWA habitat. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.

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311	256	3.8.2	States that encroachment-alteration effects on karst species will be determined based on results of the ongoing karst surveys. The impacts cannot be assessed if the surveys are not yet complete.
312	258	3.90	One site that was worthy of SAL designation was exhausted of research potential, but was the site also salvaged?
313	279	3.11.1	A windmill or well associated with historic sites 41TV1049 or 41TV1051 may be present. No wells were shown on the well map (Figure 3.11-3) in the vicinity of these sites.
314	292	3.12.2	No analysis of the aesthetics impacts as a result of highway lighting at night are included in this section. Impacts to existing unlit conditions as a result of the proposed project should be included in the assessment of visual and aesthetic impacts.
315	292	3.12.2	The Lady Bird Johnson Wildflower Center has a look out tower that was not used as a viewpoint in the study, but perhaps is the most frequently visited sited with established views of the proposed project. Although it is just outside of the study area, this would have been the appropriate site to analyze view impacts and it should be used based on current usage and impacts to those users.
316	301	4.1	Based on the amount of developable land available in the AOI; does this analysis characterize WQPL as developable? It is not.
317	302	4.1	Please identify the local planning experts that "maintain that much of the planned development in the area will occur regardless of whether or not the proposed project is constructed" and provide their justification for that statement.
318	302	4.1	"Based on the amount of developable land available in the AOI"; does this analysis characterize WQPL as developable? It is not.
319	303	4.1	Pollutant removal for parameters other than TSS has not been quantified, and stated pollutant removals for other constituents of concern in Section 3.6 are lower than those for TSS. Thus, the statement that the project is "predicted to improve the existing quality of recharge entering the aquifer..." is not supported and not valid.
320	303	4.1	Not all of the area of influence are within the areas regulated by the City of Austin under the Save Our Springs Ordinance, and the Balcones Canyonland Permit only applies within Travis County and the City of Austin. The assertion that these regulating tools will result in no additional water quality impacts from induced development within the area of influence (which includes area in Hays County) is thus not supported and not valid.
321	303	4.1	As identified in the referenced Herrington and Hiers 2010 (see Groundwater Impacts section), the water quality of Barton Springs is degrading over time. This indicates that the existing regulations including TCEQ Edwards Rules are not sufficient to preclude impacts to sensitive aquatic resources including the Edwards Aquifer. The proposed project would have direct and indirect impacts to the Edwards Aquifer and would exacerbate on-going water quality degradation of endangered species habitat and thus constitute unpermitted take of endangered species.
322	305	4.2	The proposed project includes addition of a level of impervious cover that does not comply with the City of Austin's development regulations over the Edwards Aquifer, which are the only non-degradation development ordinance in effect over the Edwards Aquifer. Additionally, area within the AOI is not regulated by the City of Austin. Thus, assertions that the proposed project would not contribute directly to substantial cumulative impacts is not supported. Additionally, the proposed project impact assessment does include the potential impacts of the other planned roadway projects over the Edwards Aquifer, and thus the DEIS is not a complete analysis.
323	305	4.2	The statement "These regulations and plans would apply to all other developments occurring within the AOI, providing regulatory means by which significant environmental impacts caused by development would be minimized." is not valid. Only the City of Austin has a non-degradation development ordinance in place, which does not cover the entire area of influence for the project.

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324	305	4.2	The DEIS correctly identifies that the proposed project would contribute to cumulative impacts. Because of the lack of quantification of impacts for constituents of concern other than TSS, the statement that the project will not contribute to significant cumulative impacts is not supported and invalid.
325	305	4.2	The DEIS notes that incremental impacts will occur to endangered species. Any impacts constitute take of endangered species and are subject to regulation under the federal Endangered Species Act.
326	305	4.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***These regulations and plans would apply to all other developments occurring within the AOI, providing regulatory means by which significant environmental impacts caused by development would be minimized.***
327	305	4.2	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Based on the analysis in the Cumulative Impacts Technical Report, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts. Incremental impacts to the Austin blind salamanders, Barton Springs salamanders, Goldencheeked Warblers, and surface and groundwater resources would be negligible in the context of the overall cumulative impacts of the past, present, and reasonably foreseeable projects. This determination is supported by several factors, including: limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction; the incremental contribution the proposed roadway would make toward induced development in the AOI; and the continuing trends of land use development and conservation initiatives underway within the RSAs***
328	307	5.0	The preferred alternative does not meet the non-degradation goal stated by TXDOT staff during meetings with the City of Austin and early technical work groups and expressed as a critical requirement by the City of Austin and other stakeholders.
329	307	5.0	The preferred alternative does not minimize the impacts to water quality protection lands and karst features to the maximum extent practicable. Significant karst features will be directly impacted by the project. The project will contribute to degradation of water quality and quantity in the Edwards Aquifer and thus constitutes unpermitted take of endangered Barton Springs and Austin Blind salamander species.
330	307	5.0	Impacts to water quality protection lands and surrounding neighborhoods are not mitigated by placement of the road within existing right-of-way. Visual and noise impacts extend beyond the right-of-way.
331	309	6.3	This section needs to include information about how long the construction process may take and the air emissions from construction equipment operation, specifically NO2.
332	310	6.40	Noise impacts to R8 should receive some sort of mitigation <$25,000 in value.
333	311	6.5.1	No details are provided on the type or frequency of water quality monitoring that would be included in the Environmental Compliance Management plan. Please provide details of what monitoring will occur and how monitoring data will be used to validate or adaptively manage construction activities to eliminate impacts to water quality.
334	311	6.5.1	What authority will the independent compliance manager have to stop or modify work? What are the goals of the Environmental Compliance Management program?

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335	311	6.5.1	Void mitigation protocols used for the proposed project should follow those in the Optional Enhanced Measures for complying with the Edwards Rules (RG-348a) to be protective of sensitive karst features.
336	311	6.5.1	No discussion of the type of vegetation that will be used in the vegetative filter strips or in disturbed areas requiring revegetation is presented. The City recommends all areas be revegetated with native species and recommends the City of Austin standards specification 609s for revegetation or specify the method and type of native vegetation that will be utilized.
337	311	6.5.1	Inconsistent specifications for pesticide use appear in the document. In some sections, it is stated that no pesticides will be used but in other sections state application is limited. Please clarify. Please prohibit the application of any pesticides and fertilizers within the project area.
338	312	6.5.1	This bullet statement is confusing and appears to be contradictory: ***"Mowing schedule according to native and non-preferred vegetation seed propagation"***
339	313	6.6.1	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered ***Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable***
340	313	6.6.1	"In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1, per the plan sheets." How would they prevent birds from building nest? This might constitute harassment of a listed species which is prohibited by the Endangered Species Act.
341	314	6.6.2	The project as stated in the DEIS impacts the quality and quantity of water recharging the Edwards Aquifer and thus impacts the endangered Barton Springs Salamander and the endangered Austin Blind Salamander species. This could constitute take of federally protected species.
342	314	6.6.2	Because of the lack of quantification of impacts for constituents of concern other than TSS, the statement that the project will improve the quality of water recharging the Edwards Aquifer is not supported and invalid.
343	314	6.6.2	The stated void inspection procedures do not include mitigation procedures, and are not compliant with the TCEQ Optional Enhanced Measures for the Edwards Aquifer (RG-348a)
344	314	6.6.2	The draft EIS states that there is no suitable GCWA habitat within the ROW, based on the 2014 surveys. The draft EIS presents presence/absence data and habitat surveys conducted by SWCA, and reports that no Golden-cheeked Warblers or habitat were observed within the proposed ROW. However, the draft EIS also presents partial findings of a GCWA habitat model developed by Texas A&M, and states that there are about 2,010 acres (813 hectares) of potential GCWA habitat within the study area based on this model and a review of aerial photography and survey observations. If acreage estimates from the TAMU model are presented, then the location of these patches, along with the predicted occupancy, density, and abundance for each patch, should also be presented. The TAMU model includes a habitat patch within and adjacent to the SH45 ROW that has a predicted occupancy of 0.89 and a predicted density of 0.25 male GCWAs/ha. This would indicate a predicted abundance of about 10 male GCWAs within the ROW, and about 200 male GCWAs within the study area. If this model is to be accepted, then all of the information should be presented. Otherwise, the model should be rejected due to overestimation and poor correlation with GCWA presence/absence and territory data. We have also found that the TAMU model tends to overestimate male GCWA abundance within the Balcones Canyonlands Preserve and Water Quality Protection Lands, particularly in low density areas.

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345	314	6.6.2	Section 6.6.2 does not address mitigation of impacts to golden-cheeked warbler habitat and BCCP karst zones 1 and 2.
346	314	6.6.2	States that no habitat ranges for listed karst species overlap with the project area. There is currently a collection of Texelis reyesii from Barker Ranch Bat cave within the evaluation area.
347	315	6.6.8	No mention of the contractor providing hazardous materials "awareness training" for all staff performing grading and/or excavation on how to identify and manage suspected contaminated soil or groundwater that might be encountered. Only a small reference is made to training under Hazardous Materials Spill Protocols (App. H 4.1.5 Spill and Hazardous Materials Management)
348	316	6.9	The project would be constructed on fill and thus elevated, which would result in visual and aesthetic impacts to surrounding areas which were not evaluated by the DEIS.
349	316	6.9	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered ***Impacts to visual and aesthetic resources would be minimized to the maximum extent practicable during the final design of the proposed project.***
350	316	6.90	Priority viewpoints do not include a frequently used viewpoint at the Lady Bird Johnson Wildflower Center.
351	B-1	1.0	There is no typical section for the segment(s) that will include the diversion berm and bentonite soil cap near Flint Ridge Cave.
352	C-5	5.0	Sheet 5 depicts diversion berm with a breach for wildlife /pedestrian crossing within Flint Ridge Cave basin and ~ 500' from Flint Ridge Cave opening. How will this effectively divert polluted roadway runoff away from Flint Ridge Cave?
353	D-10	1.0	AASHTO guidance suggest that the following be used for documenting indirect impacts. The DEIS falls short of following this guidance. ***Explain the Methodology. Just as important as selecting a reasonable methodology is the importance of clearly explaining why that methodology was selected. The advantages and disadvantages/drawbacks of the methodology should be acknowledged, not ignored.*** ***Provide Factual Support. The evaluation of trends and conclusions about environmental consequences should be based on up-to-date factual information. Graphs, tables, and other graphic elements should be incorporated, where appropriate, to aid readability.*** ***Use Clear Reasoning. The conclusions of the assessment should be supported by logical analysis and plausible reasoning, and not contain internal inconsistencies or contradictions that put the results into question. It also is important to document the uncertainties involved in the analysis, explain the importance of those uncertainties, and explain how they have been addressed. Legal Sufficiency Criteria. For a more detailed list of factors to consider in assessing the legal sufficiency of indirect effects and cumulative impacts analyses, refer to Appendix 1A (indirect effects) and Appendix 1B (cumulative impacts). These lists also are based on the recommendations in the NCHRP report, Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents (2008).***

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354	D-10	4.0	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Table 4-2 EJ groups are comprised of vulnerable populations, including minorities and low income persons. TxDOT follows principles in E.O. 12898 and Title VI to provide protections for EJ populations. Project-induced growth is not anticipated to have a significant effect on neighborhoods, including those in EJ communities. Displacements from project induced growth are not anticipated.***
355	D-11	4.0	The proposed project would directly impact the subsurface catchment area for Flint Ridge Cave and thus directly impact the species of concern that live in Flint Ridge Cave. Additional karst features would be directly impacted by the project, thus indirectly impacting Barton Springs. Expand the Area of Influence to include Barton Springs and evaluate the impacts on that valued and unique environmental resource.
356	D-11	4.0	The proposed project would indirectly impact the Barton Springs and Austin Blind salamander species by decreasing recharge to the aquifer and by increasing pollutant loading to the aquifer.
357	D-12	4.0	Table 4-2 Does not consider cumulative impacts with respect to other TxDOT/CTRMA projects including Mopac intersections, Mopac South, and Oak Hill Parkway because the AOI is inadequately defined. Nor does it address changes to runoff and recharge in connection with other development in the AOI or provide a robust AOI. Instead it seems to described effects as diminimus because of other development.
358	D-14	6.3	Include a statement about air quality impacts resulting from construction equipment - PM and NO2.
359	D-15	4.0	Obtain more updated well locations from the Barton Springs Edwards Aquifer Conservation District
360	D-15	4.0	Figure 4.1 Spring data is incomplete. Springs on Marbridge and on WQPL Tabor tract are not depicted.
361	D-22	5.0	The DEIS cites Imagine Austin and City of Austin water quality regulations, but the proposed project does not conform to those regulations. Explicitly note that the proposed project does not conform to the City of Austin comprehensive plan or Land Development Code.
362	D-23	5.0	The DEIS cites the City of Austin Habitat Conservation Plan for the Operation and Maintenance of Barton Springs Pool, and identifies a goal of that plan is to reduce anthropogenic pollutants impacts to salamanders and their habitat. The proposed project does not comply with this goal as it will reduce the quantity and quality of recharge to the aquifer, and this should be identified in the DEIS.
363	D-24	5.1	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered ***Maintain or restore natural ecosystem characteristics of Barton Springs and the Austin blind salamanders habitat to the maximum extent practicable***
364	D-24	5.1	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered ***Restore and maintain natural flow regimes in Barton Springs Pool, Eliza Spring, Old Mill Spring, and Upper Barton Spring to the maximum extent practicable***
365	D-28	5.1	Section on BCCP does not describe permit commitment to protect 62 caves, including Flint Ridge.
366	D-28	5.1	Documents BCP efforts to protect 30,428 ac of bird habitat but fails to address BCCP goal of protecting 62 caves and karst feature that provide habitat for 6 listed Karst invertebrates and 26 karst species of concern.

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367	D-33	6.0	Include impacts to karst features resulting in loss of recharge quantity as an impact causing activity
368	D-33	6.0	Include visual impacts from elevation of the roadway because construction will occur on substantial amounts of fill material as an impact causing activity
369	D-34	6.0	Sand cannot be used as a de-icing material on permeable friction course without adverse impacts to pollutant removal efficiencies.
370	D-37	7.2	Figure 7.1 inaccurately depicts WQPL. Does not include 500 +/- acre acquisition from Avana.
371	D-4	3.2	The Area of Influence defined for the project is not adequate. The project directly and indirectly affects the Barton Springs Segment of the Edwards Aquifer as stated in the DEIS. AOI boundaries should be expanded to include all of the Edwards Aquifer recharge zone from the project area north to Barton Springs and the Colorado River (Lady Bird Lake). Adjust the AOI accordingly, and reevaluate the indirect impacts.
372	D-40	7.3.1	Table 7.2. Describes Obar ranch as 1500 ac of potential development. Does not acknowledge that this tract is encumbered with a conservation easement that limits impervious cover to 1.7% gross area and only allows it to be subdivided into 15 parcels.
373	D-41	7.3.2	This section does not address loss of recharge due to directly impacted karst features and loss of subsurface catchment area. Loss of recharge to the aquifer constitutes take of endangered salamander species.
374	D-41	7.3.2	Klenzendorf et al. 2011 is a powerpoint presentation, and should not be cited as a technical reference.
375	D-41	7.3.2	Klenzendorf et al. 2011 shows less than 96% removal rates for permeable friction course for some metals, and shows export of nitrate from permeable friction course which is not addressed by the DEIS. This suggests that TSS alone is not an appropriate surrogate for all runoff constituents of concern
376	D-41	7.3.2	***"Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Standard, 2008) can be removed from highway runoff as it passes through these permeable road layers"*** . What is the fate of these contaminants once they are removed by PFC. At what point does PFC become "saturated" with filtered contaminants? Does PFC ever discharge filtered contaminants. Is TxDOT assuming that PFC will continuously and perpetually accumulate contaminants without reaching capacity? When maintenance is done to the road surface what are the plans to capture and retain contaminants held in the PFC so that it is not discharged as a slug of accumulated pollutants at one time? These issues should be addressed before assuming the long term benefits of PFC.
377	D-42	7.3.2	That conclusion that no adverse impacts to Barton Springs will occur is not supported. The distance of the project from Barton Springs is not relevant as City of Austin dye studies indicate rapid travel times from the project to Barton Springs and little to no subsurface attenuation of contaminants. Additionally, analysis only of TSS and not of other pollutants or loss of recharge was conducted in the DEIS to support this conclusion.
378	D-42	7.3.2	The DEIS correctly identifies that some pollutants including metals would not be removed by the proposed BMPs. The DEIS incorrectly concludes that these will have no adverse impacts because of the hardness of Barton Springs water. Only a quantitative analysis of the pollutant concentrations relative to the TCEQ aquatic life criteria for toxic substances can be used to make such an assertion.
379	D-42	7.3.2	***"Because of the engineered BMPs that would allow for a TSS removal rate of at least 90 percent, the distance from the proposed project to Barton Springs, and the relatively small amount of stormwater that would recharge from the project area to the Edwards Aquifer, no adverse impact to springs would be expected with the proposed project."*** Where are the calculations/estimates on recharge occurring relative to project. Because this area has a very high concentration of karst, its relative contribution to recharge is likely higher than the assumptions used to generate this statement.

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380	D-43	7.3.2	No subsurface catchment area impacts for Flint Ridge Cave are assessed by the DEIS.
381	D-43	7.3.2	The project is not compliant with the City of Austin Save Our Springs Ordinance and does not achieve non-degradation standards.
382	D-43	7.3.2	No evaluation of the dilution of pollutants in the aquifer was conducted in the DEIS. The conclusion that minimal amounts of pollutants would enter the aquifer is not specific and should be quantified. What are acceptable amounts of pollutants that can enter the aquifer?
383	D-43	7.3.2	The goal of the Edwards Rules is non-degradation of existing groundwater quality (30 TAC 213.1). The project does not comply with this goal as existing groundwater quality will be degraded by the proposed project.
384	D-43	7.3.2	***"The limits of the berm would extend far enough beyond the cave watershed to ensure there is no chance for untreated runoff to enter the cave. In addition, since the Build Alternative would remove a portion of its watershed, surface flow from an equivalent area would be re-routed to the Flint Ridge Cave drainage area to mitigate for the area being removed.***" there has been no discussion of the indirect effect of covering the surface and disrupting very discrete recharge that is not attributable to visible features and openings.
385	D-43	7.3.2	***"Chances of contaminated water from a spill reaching Barton Springs are unlikely due in part to the implementation of hazardous material traps and filtration ponds, the distance between Barton Springs and the proposed project, and the vast volume of water in the aquifer (TxDOT, 2014)*** ." This appears to assume that natural process in the karst aquifer will serve to remove pollutants for water recharged from the surface. This assumption is not substantiated by research and modeling included in the City of Austin's Barton Springs Catastrophic Spill Plan which was accepted by the U.S. Fish and Wildlife Service. It also assumes dilutions will mitigate contamination. Since BSS and ABS are very sensitive receptors this assumption should be substantiated by calculations and data.
386	D-43	7.3.2	***"There are several relevant points with regard to dilution of pollutants in the groundwater: The COA "has enacted policies and made significant investments in the protection of water quality in the Barton Springs Zone of the Edwards Aquifer."*** So is TxDOT assuming that since COA does this elsewhere they are not obligated to?
387	D-43	7.3.2	***"The use of PFC overlays has proven to yield water quality benefits. Recent study data indicate that up to 96 percent of TSS (Klenzendorf et al., 2011) and up to 90 percent of heavy metals (Barrett and Stanard, 2008) can be removed from highway runoff as it passes through these permeable road layers."*** The current TCEQ guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with TCEQ regulations and guidance.
388	D-44	7.3.2	***"Texas' application to administer NPDES. EPA states:"*** - This section discusses increased monitoring and improved standards expected from the state but does not reveal whether those changes have ever been used successfully to achieve the level of protection proposed. This assumption by TxDOT is not backed by data.
389	D-45	7.3.2	This section inadequately describes indirect effects on golden-cheeked warblers. It does not address indirect effects on habitat adjacent to the ROW, habitat fragmentation, introduction of predators and other invasive species, and noise impacts.
390	D-45	7.3.2	***"Golden-cheeked Warbler habitat within the AOI, approximately 13,223 acres of which fall outside of the proposed project ROW and thus have the potential to be indirectly impacted. However, 4,363 acres of this habitat, or 33 percent of it, fall within COA WQPLs and are therefore protected."*** There are portions of the SH45 alignment that are within 100M of occupied habitat. USFWS regulations consider this indirect effects on GCWA.

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391	D-46	7.3.2	***"potential effects to groundwater resources include short-term potential for pollutants in stormwater runoff…*** " - Is this transient impact quantified anywhere?
392	D-46	7.3.2	"***indirect impacts to surface water resources are not expected to be substantial." -*** This is not substantiated anywhere and no attempt is made to quantify indirect impacts.
393	D-49	7.3.3	***"...constraining the amount of growth possible in the area…*** "If development potential is constrained by land preservation and lack of infrastructure how are population growth projections discussed previously justified?
394	D-50	7.3.3	***"There are several ongoing or planned roadway projects in the AOI (FM 1626, Frate Barker Road, Manchaca Road, Old San Antonio Road bridge, proposed Escarpment Blvd extension into Hays County)" -*** are these considered as part of cumulative effects assessment?
395	D-53	7.3.3	***"Hill Country Conservancy (HCC) is considering purchasing certain parcels for conservation,"*** - do they have funding to accomplish this. Does this in anyway contribute to the analysis of the DEIS
396	D-55	8.1.1	***"The BCCP was a plan written by COA and Travis County in order to obtain an incidental take permit for Golden-cheeked Warblers, Black-capped Vireos, and six species of federally-endangered karst invertebrates under section 10(a)(1)(B) of the ESA. The take covered by the permit would include take associated with..."*** - This section seems to infer that this project and/or new development induced by the project are mitigated by BCCP. at this point in time none are, and they are not required to participate in BCCP by any regulation. This assumption is inaccurate.
397	D-56	8.1.2	Insufficient analysis is presented in the DEIS to support the conclusion of no take of endangered salamanders. The project would reduce the quantity of recharge to the aquifer. Only TSS load reduction was quantitatively evaluated, despite citing references that show pollutant removal for nutrient and metal constituents to be less than TSS removal. The actions could constitute take of salamanders
398	D-56	8.1.2	Water Quality Protection Lands purchased by the City of Austin are not for mitigation of the proposed project impacts.
399	D-56	8.1.2	***"...land set aside for the BCCP protects groundwater quality in the Barton Springs segment of the Edwards Aquifer"*** There is no land set aside for BCCP in the current delineation of the AOI. There is no analysis that shows that the BCCP is all that is needed to protect groundwater quality in the BSEA.
400	D-57	8.2	The DEIS does not specify if the proposed project will comply with the two Optional Enhanced Measures guidance documents for complying with the Edwards Rules as cited in this section. The DEIS does not specify a goal of achieving non-degradation of the Edwards Aquifer.
401	D-57	8.2	The most recent City of Austin watershed protection ordinance was passed in October 2013.
402	D-57	8.2	The proposed project does not comply with City of Austin development regulations.
403	D-57	8.2	The proposed project is not consistent with the Balcones Canyonlands Conservation Plan as it directly impacts Flint Ridge Cave without providing mitigation.
404	D-58	8.2	Although TCEQ has a goal that groundwater not be degraded in 30TAC213, "non-degradation" is not found in the regulation nor a definition thereof. As mentioned earlier, Chapter 26.401(b) states what nondegradation is not (no increase in pollutant discharge), but not what it is. TxDOT should propose a definition or rely on COA application of the SOS ordinance.E34

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405	D-58	8.2	"The Balcones Canyonlands Conservation Plan (BCCP), a regional Habitat Conservation Plan administered by the City of Austin and Travis County, protects over 28,000 acres in Travis County as the Balcones Canyonlands Preserve. The BCCP includes requirements to protect caves and other karst features where endangered species or species of concern have been found (COA-Travis County 1996)." - - Flint Ridge Cave is one of those caves. It is not clear how the DEIS considers it protected in light of this project. The DEIS states we are required to protect and it is not stated what action the preparers are implying the BCP permittees should take.
406	D-60	8.2	State if the proposed project will follow the City of Austin void mitigation procedures referenced.
407	D-60	8.2	The correct web address for the City of Austin codes and criteria is no longer AMLEGAL but is now: https://www.municode.com/library/tx/austin
408	D-63	9.0	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Based on the amount of developable land available in the AOI, the pace of development being documented in Hays and Travis Counties, and the responses of local planning experts, the proposed project is not anticipated to generate significant induced development.***
409	D-64	9.0	Indirect effects of the proposed project directly conflict with the City of Austin Imagine Austin comprehensive plan and are not consistent with City of Austin Land Development regulations.
410	D-64	9.0	The indirect effects of the proposed project would substantially worsen the condition of a sensitive resource, specifically the Edwards Aquifer and Barton Springs and habitat for endangered species, and thus additional mitigation is necessary.
411	D-7	4.0	More than 19% of the study area is undeveloped and developable land as stated in section 3. This is inconsistent with the statement that "there is limited development potential nearby"
412	D-7	4.0	Table 4-1: Questions 3 and 7 are answered "yes", yet they are posed as "and/or", not yes or no.
413	D-9	4.0	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Planning experts from the jurisdictions within the AOI do not expect significant development to occur as a result of the proposed SH 45SW project. Experts contacted in Buda and Hays County asserted that the developments currently planned for the area would be constructed regardless of whether the proposed project were built or not. While experts with the City of Austin and Travis County acknowledged that they expect the roadway to affect the amount and rate of development in the AOI, both also pointed to the minimal effect the proposed project would have on development in the region, given the area's high rate of growth overall. Therefore, impacts to neighborhoods resulting from induced growth associated with the Build Alternative are not anticipated to be substantial.***
414	H-1	1.0	On the water quality monitoring, it would be helpful to provide references to the various reports pertinent to the project including those specifically on SH45SW and Barton Springs water quality.
415	H-1	1.0	All of the available water quality data and trends published do not seem to be used in the report as stated.
416	H-2	1.0	Repeating request for clarity of "minimal negative impacts".
417	H-10	A.5	The international BMP database is referenced here, yet calculation methods proposed in it are not used for BMPs in series, monitoring methods proposed by it are not used, and pollutants besides TSS that are addressed in it are not considered. The TCEQ methods are used as the fallback again, which are inadequate for this application.

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418	H-11	3.0	A fundamentally flawed assumption is that all of these regulations will result in adequate protection of the sensitive resources involved. Most are state or nationwide and are the lowest common denominator for environmental protection. Some are better than others, but minimum regulatory controls are not enough for the impacts from SH45SW.
419	H-11	3.0	Regulatory measures are presented without much commitment to go beyond the lowest common denominator with the exception of the Edwards Aquifer rule TSS removal requirements. First, the stated use of only TSS as a parameter for BMP design does not result in adequate protection. Second, meeting the minimum threshold for both analysis and protection is not consistent with the stated TxDOT goal of making this roadway the most environmentally suitable sensitive built in the state as discussed at numerous meetings on the project.
420	H-11	3.1.1	Several places such as the discussion of 404 requirements are merely to document why the regulation doesn't apply and a lesser regulatory standard is made. The point being here that even though a NWP applies and a PCN is not required, the standard of protection for the most stringent permitting classification (individual 404) and associated standards could be used to bolster the commitment to non-degradation rather than the minimum required by regulations. The individual permit and associated regulations and guidance is an example.
421	H-12	3.1.1	The mention of the City's Land Development Code and SOS ordinance, and ECM is made, but no commitment is made here on whether the project will meet these standards for BMPs, impervious cover, and Critical Environmental Feature Protection. Critical to this commitment is a non-degradation standard (rather than goal) for this sensitive area.
422	H-12	3.1.2	Groundwater section doesn't mention BSEA as sole source aquifer and what protections this affords it that can be used. Re: lawsuit document that says because no federal funds were involved (1992), SSA regulations and review don't' apply. As with other regulations, this could be used as an above and beyond for TxDOT to consider if there is additional to benefit water quality/quantity protection. It fits the definition of SSA regardless of federal funds involved.
423	H-12	3.1.2	Source water protection measures in the Safe Drinking Water act for sole source aquifers are not just for wellhead protection and other activities on a regional or supplier basis. These measures can be used to some degree at a project level such as the SH45SW project. The examples of such projects could be used as models of what would be necessary to prevent contamination of the BSEA. MOU between EPA and state highway administrations on sole source aquifer protection are common. This potential should be investigated further to meet superior environmental goals for the project.
424	H-12	3.1.2	Texas Water Code 26.401(b) states what nondegradation is not without stating what it is. Clean water act definition of degradation of surface waters is a negative change in water quality parameters that are significant from that present at the time the CWA was promulgated in 1974 as compared to today. It is an ambient water quality data driven determination. TCEQ definition of degradation is vague and useless in evaluating projects such as SH45SW. Therefore TxDOT should either propose a measurable definition of degradation and nondegradation or adopt that in the COA SOS ordinance.
425	H-12	3.1.2	"***Any project located within the Barton Springs segment of the Edwards Aquifer would be required to follow all applicable regulations"*** This does not provide assurances that the regulations are adequate or that TxDOT is willing to go beyond the inadequate regulations currently in place at the state level or in other jurisdictions.
426	H-12	3.1.1	It is disingenuous to include local ordinances that protect water quality when the state does not follow them. If the state would choose to follow the City of Austin's' SOS Ordinance it would greatly reduce operational water quality impacts. An acknowledgment of the regulation does not constitute a commitment to comply with it.

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427	H-13	3.1.2	Since the regulations of the Barton Springs Edwards Aquifer Conservation District don't apply to state highway projects this paragraph should be replace by one that discusses the application of the Consent Decree between the BSEACD and TxDoT to this proposed project.
428	H-14	3.2	The selection method for BMPs by decision tree does not replace an examination of what will work, what has worked, documented examples of what worked, or support of any kind for construction and operation of a highway in a sensitive karst aquifer watershed with implications for recreation, water supply, endangered species. Due diligence demands such in-depth analysis and effort beyond the status quo.
429	H-15	3.2	Rather than adopting a method for BMP selection from South Carolina, wouldn't it be simpler to just adopt the local City of Austin Environmental Criteria Manual.
430	H-17	3.2	Equations identify that efficiency is "(not in percent)" but not the units required
431	H-18	3.2	The list of non-structural BMPs are presented without any indication of commitments to use any of them on this project.
432	H-18	3.2	Why mention proprietary methods if they were "generally not successful", or else identify how they have been successful when incorporated into a project with other BMPs.
433	H-19	4.0	Please define the Engineering Work Group with approval authority over modifications to DEIS commitments. It appears that no independent review will be made for these modifications.
434	H-19	4.1	"***This begins with a commitment to carry out all appropriate and permitted resource investigations and to adhere to subsequent commitments and recommendations"*** is mentioned here in relation to construction phase controls; however, the "resource investigation" of subsurface catchments of Flint Ridge Cave and the other significant features identified in the ongoing geological assessment have not been carried out. The DEIS should go no further without completion and use of these investigations.
435	H-19	4.1	Statements of measures to avoid impacts to groundwater quality and aquatic salamander habitat during drilling would appear to be reasonable methods applied anywhere and not driven by the sensitivity of the project. Methods of protection above and beyond the lowest common denominator should be listed in the DEIS, as these normal methods are assumed.
436	H-19	4.1.1	Site preparation "done in a way to minimize the amount of natural vegetation disturbed at any given time" should be included beyond staging and fencing. This would be part of a superior environmentally protective project. It should be posed as a chance for innovation to the E&S design group and documented here.
437	H-2	1.0	Mitigating effects of structural BMPs would appear to indicate a direct linkage between controls and aquatic life. Only control of TSS load was presented. No way to determine if this is enough to protect aquatic life and cannot be counted on to work alone. Avoidance should be considered first.
438	H-2	1.0	Please provide a definition for "minimal negative impacts".
439	H-20	4.1.1	Much of the section on SWP3 compliance could be referenced to the COA Environmental Criteria Manual rather itemized here
440	H-20	4.1.1	Although mentioned in other sections, the intent to comply with all parts of the Optional Enhanced Measures should be listed under WPAP completion.
441	H-20	4.1.1	Natural buffers that are not to be disturbed should be protected by fences installed prior to initiation of any ground disturbance.
442	H-20	4.1.1	Referenced Text: "***An Environmental Compliance Management Plan (ECMP) would be developed with water quality specific guidelines and trained personnel to ensure its success***." - Please provide an outline of the proposed plan. Environmental Impact can not be determined from the intention to develop a plan.

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443	H-21	4.1.2	***G*** reatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***If dikes are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.***
444	H-21	4.1.2	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***If swales are found to induce off-site erosion, flow control measures (e.g. silt fences, rock berms) and sediment control measures (e.g. catchment basins, sandbag berms) would be installed to reduce erosion and prevent sediment from leaving the state-owned ROW to the greatest extent practicable.***
445	H-21	4.1.2	"If dikes are found to induce off-site erosion…" and "If swales are found to induce off-site erosion….". Does this happen much with TxDOT designs of these features. If so, it gives little confidence that dikes and swales proposed for this project will be adequately designed and implemented commensurate with the sensitivity of the project area.
446	H-23	4.1.4	Construction of permanent controls "as early as practicable" is not a comforting commitment. Analogies to WTP4 by the COA would encourage TxDOT to make the commitment that permanent controls WILL be in place during construction phase or some other statement stronger than "early as practicable"
447	H-24	4.1.5	Spill and Haz. Materials Management sections fails to specifically reference (Use and Management of Containers,40 CFR 264.175 - 274.176) Small/Portable Secondary Containment. Although this may be covered in the Hazardous Materials Spill Protocols there is no way to verify with a broad reference.
448	H-24	4.1.4	For erosion controls, COA has had some success with coir logs. These might be useful around karst buffers.
449	H-24	4.1.5	Some separation of what is required versus what is proposed as a superior protection for the sensitivity of the project area should be attempted. The Spill and Hazardous Materials Management and Good Housekeeping "would be used" indicates the business as usual protocols and methods and not what would be above and beyond.
450	H-25	4.2	As in many projects in the BSEA, the geological features of significance are open to interpretation. Typically, geologists from the City identify a number of features conservatively and others that require additional investigation. The applicants geologists then evaluate features that are under dispute and some settlement is reached that is often less than adequately protective of recharge water quality and quantity than what is proposed by the City to begin with. Although the collaboration on surveys in this project is encouraging, superiority of the project would warrant an assumption of significance for recharge features where doubt remains, or further investigation is not scheduled..
451	H-25	4.2	COA has conducted a recent analysis of the surface catchment of Flint Ridge Cave surface catchment using 1 ft contour intervals (versus 2 ft used by the TxDoT consultant) and observations from the historic October 2013 rains. That analysis shows the surface catchment to be 57.8 acres versus the 43.8 used in the EIS.
452	H-25	4.2	This portion of the DEIS does not address the fact that a portion of the roadway ROW overlies the Flint Ridge Cave system and what potential impacts that might have.
453	H-25	4.2	Says 5.6 acres of Flint Ridge surface catchment will be covered by impervious surfaces but does not note how many acres of the catchment will be disturbed or diverted by the east side berm.

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454	H-25	4.2	The DEIS states that BMPs would maintain the flow to naturally occurring sensitive features to the extent practicable but then only mentions that the amount of (surface) water draining to Flint Ridge would be maintained. Since the DEIS does not contain the most recent karst data impacts on surface drainage to other karst features can not be determined. However, COA calculations of the drainage areas cutoff to other karst features indicate a significant reduction in area draining to features such as Hat Sink, Jubilee Sink, F29 and F136.
455	H-25	4.2	To prevent the possible infiltration of untreated roadway stormwater runoff through the soil matrix into Flint Ridge Cave, a bentonite (clay) liner would be installed up gradient from and adjacent to the berm. This would entail excavating approximately six inches of soil below the topsoil level, placing and compacting the bentonite liner, and covering with adequate topsoil to support revegetation. Since we do not know where the subsurface catchment area is, it's hard to say if this would work, and if so, then it would alter the hydrological regime further drying out the cave, thus negatively impacting the cave fauna.
456	H-26	4.2	A good example of a berm with bentonite liner should be provided to ascertain if this method will be successful or not. Since so much depends on it's operation to divert stormwater, an untried design with doubt as to long term viability should be approached with all due caution.
457	H-26	4.2	Use of bentonite to reduce infiltration of runoff through soils is creative and indirectly acknowledges that runoff does infiltrate through soils. However, the DEIS does not address how the bentonite will stay hydrated to prevent cracking which would allow runoff to pass through the bentonite layer and into the vadoze zone or how this BMP will be inspected
458	H-27	4.2	The Geological Assessment of the WPAP requirements is stated to identify other features within the SH45SW "footprint". This limited area, even smaller than the ROW would seem to be and inadequate boundary for the assessment. At least the ROW and hopefully extending to surface and subsurface drainage extents boundaries should be used for the assessment regardless of the TCEQ lowest common denominator.
459	H-27	4.2	This appears to be the only specific mention of the drip tests ongoing by the COA. This is the method of hydrogeological investigation endorsed by USFWS for use in showing adequate protection for BCP caves such as Flint Ridge and at minimum merits a discussion in the DEIS of how that data will be incorporated during design of the project.
460	H-27	4.2.1	***"The cave is currently gated, and bi-annual cave faunal surveys and cricket counts are being conducted."*** WPD staff have recently bumped up surveys to quarterly, plus additional surveys 2 weeks after any dye injections. The DEIS does not address potential impacts to Flintridge cave and other nearby caves from introduced invasive species such as tawny crazy ants nor does it address site disturbance/ reduction in canopy cover thus improving conditions and densities or red imported fire ants.
461	H-31	4.2	It is somewhat alarming that the use of a vault over the Flint Ridge cave opening is being considered without an in-depth hydrological and hydraulic evaluation as part of the DEIS. However, leaving such decisions for the design phase are just as disturbing because no public review will be possible at that point.
462	H-31	4.2	COA has recently estimated the surface catchment to several karst features within the SH45 ROW and will provide them to TxDOT/CTRMA for use in the DEIS.
463	H-32	4.2.1	2nd bullet, states If features or their catchments cannot be avoided, the area may be bridged. If a bridge option is implemented, cave entrances must be protected as outlined below Why not construct a bridge over Flintridge cave, thus reducing impacts on the surface, subsurface, and cave footprint?

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464	H-33	4.2.2	Closure or mitigation of recharge features due to not practicable changes in alignment are referenced for the planning phase of the project. Given the final design contract is being decided during the review of the DEIS, it would seem that the planning phase is right now. However, the geological surveys are not complete and proposals for closure or mitigation of each feature have not been made.
465	H-33	4.2.2	TxDoT and CTRMA should be proactive and commit to protect all the natural buffers to all karst features that will remain within the ROW.
466	H-33	4.2.2	Karst features and undisturbed natural buffers should be fenced prior to any ground disturbance and the fencing can be used to help support the erosion/sedimentation controls for the feature.
467	H-33	4.2.2	The DEIS should commit to restoring natural runoff to all karst features in the project area that are cutoff or reduced as a result of the project similar to that proposed for Flint Ridge.
468	H-34	4.2.3	The protocol should add an item to have a U.S. Fish and Wildlife Service karst surveyor (biologist) inspect a void for potential karst invertebrate species or habitat. This protocol is described on page 3.8 of Appendix B of TCEQ Guidance Manual (RG-348) entitled "Complying with the Edwards Aquifer Rules: Technical Guidance Manual on Best Management Practices" - "*Optional Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates* ."
469	H-34	4.2.4	Please change the reference of (30 TAC 213 A (14)) to (30 TAC §213 (14))
470	H-34	4.2.4	All voids encountered should be reported to TCEQ. Please add "and reported to TCEQ." after "inspected by a qualified geologist" in the first paragraph.
471	H-34	4.2.4	At the end of the first paragraph, add a statement that the protocols of 2.2 of RG-348A, "Optional Measures for the Protection of Water Quality in the Edwards Aquifer (Revised)" (Sept. 2007) will be followed. RG-348A is Appendix A of RG-348.
472	H-34	4.2.4	Bullet one should add "(less than 1 cubic foot)" after "small" and "located above a utility pipe embedment" after biological activity.
473	H-34	4.2.4	Bullet two should be revised by replacing the word "covered" with "sealed" and to add the phrase "along the trench floor or wall" after (18 inch minimum thickness).
474	H-34	4.2.4	Suggest adding a third bullet that reads: "Encase utility pipes for the distance of the void plus 5 feet on either end and ensure that a minimum of 6 inches of concrete surrounds the pipe."
475	H-34	4.2.4	Suggest adding a fourth bullet that reads: "Voids that intersect the plane of the trench floor that exceed 4 feet in any direction require a specific engineered solution to address environmental and structural integrity."
476	H-34	4.2.4	It does not address what to do if a void is encountered with "biological activity".
477	H-35	4.2.4	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***In cases of voids with water flow, flow would be maintained to the greatest extent practicable,, the walls would be stabilized if necessary with planks or sandbags, concrete would be poured over the pipe, sealing the void.***
478	H-35	4.2.4	Change first bullet to eliminate all of the sentence after the comma and replace with the following text "with pipes or trench modifications to isolate and preserve flow paths." This would be in line with the requirements of 30 TAC §213.5(b)(4)(B)(iv) to provide pollution prevention and flow preservation.

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479	H-35	4.2.4	Add a second bullet that states "Mitigation will not occur until TCEQ has provided written authorization for the proposed method for a specific void."
480	H-35	4.3.1	***"Permeable/Porous Friction Course (PFC) Pavement. PFC would be applied to the majority of SH 45SW road surfaces (exceptions being the bridge structures and the SUP). PFC has been shown to reduce up to 96 percent of TSS loads and 90 percent of heavy metal loads in stormwater runoff."*** The current TCEQ guidance for compliance with the Edwards Aquifer rules notes that pervious concrete is only allowed in the contributing zone, is not appropriate for highways, and requires reduced loads and speeds. The DEIS does not address how the proposed porous pavement will comply with TCEQ regulations and guidance.
481	H-39	4.4	Testing of permanent BMPs is mentioned over the life of the project and the goal of using this for restoring intended function if not working as designed. This is an admirable commitment and one that should be outlined in more detail in the DEIS. Where else would it be outlined if not in the DEIS since final design is the next stage. Structures for flow and water quality monitoring of both ambient surface and groundwater quality as well as BMPs need to be planned and included in the design, not as an afterthought.
482	H-41	5.1	Greatest Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered. ***Staged construction, limited soil disturbance/preservation of natural vegetation, and robust erosion and sedimentation control BMPs would be in place throughout construction to decrease erosion and ensure that off-site discharge of sediment is avoided or minimized to the greatest extent practicable.***

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483	H-44	5.1	Referenced text: "***Current annual TSS loading over the Recharge Zone within the proposed project area is approximately 9,702 pounds TSS/year (see Table 5.1-3). Impervious surfaces associated with the proposed project would be expected to generate an annual TSS load of approximately 86,834 pounds/year. Currently proposed BMP configurations would exceed an 80 percent removal rate over the entire project. The Edwards Aquifer Rules (30 TAC 213) require the treatment of stormwater runoff from projects over the Edwards Aquifer Recharge Zone such that 80 percent of the incremental increase in TSS load generated is removed before the water is released. The portions of the proposed project over the Recharge Zone would be expected to generate a TSS load of 75,942 pounds/year. Design goals include configuring permanent, post-construction BMPs to achieve a TSS load reduction of at least 90 percent over the Edwards Aquifer Recharge Zone. Proposed BMP configurations over the Recharge Zone would exceed this goal and remove approximately 92.1 percent of the TSS load, thus leaving an annual load of 6,030 pounds of TSS. Although stormwater treatment is not required by over the Transition Zone (30 TAC 213), current design proposals would include stormwater treatment in these areas as well. Treatment of stormwater runoff would thus allow for a net decrease in annual TSS loading (an improvement over the No Build). Based on the net load calculated for the proposed project and rainfall data for the area (56.1 acres of impervious surface over the Recharge Zone and a 32 inch/year average rainfall), [(6,030 lbs. TSS/yr.) / (173.6 acre-feet of rainfall / year)], average TSS concentrations of stormwater runoff from the proposed project would average approximately 12.8 milligrams/liter (mg/L).***" - This analysis relies upon TCEQ Edwards Aquifer Technical Guidance (EA TG) for sizing BMPs to compare pre-development and post-development loads. This analysis does not explicitly account for the actual size of the ponds, the contributing drainage area or the drawdown time as it relates to runoff capture efficiency. The TCEQ methodology does not explicitly account for loads that bypass the BMPS. The methodology uses several implicit assumptions to make the calculations simple, but less accurate. Additionally, Removal Efficiency is not a recommended procedure for measuring pollutant removal ("Use of Percent Removal to Evaluate BMP Performance." International BMP Database FAQ, 2007). The City of Austin has updated the Environmental Criteria Manual to reflect the state of the science in calculating pollutant removal in BMP performance (ECM 1.6.9). It is recommended that this project adopt current methods to evaluate stormwater load impacts to characterize environmental impacts. Additional examples of TCEQ deficiencies in allowable calculations include the treatment train equation. The EA TG Manual does not have a reference for this treatment train efficiency calculation. It appears that the TCEQ referenced the City of Austin's old Environmental Criteria Manual as a source for treatment train efficiency. Please provide reference that demonstrates the validity of the treatment train efficiency. The City of Austin no longer recognizes it as a valid method for calculating controls in series. Finally, the use of TCEQ rules is deficient in that is only considers TSS as a pollutant of concern. The proposed ponds have 80-90% removal efficiency for TSS, however, City of Austin Environmental Criteria Manual section 1.6.5 demonstrates significantly lower removal for pollutants of concern like Total Phosphorus (61%) and Total Nitrogen (31%). In conclusion, statements claiming that TSS loading after construction will be less than undeveloped conditions is optimistic and should be checked with a more robust method.
484	H-46	5.1	Greatest Extent Practicable is a term under much debate and a discuss of it's meaning in light of EPA guidance and case law is necessary at some point. The example does not cover all the measures that would define GEP. ***The quality and quantity of recharge reaching sensitive features would be preserved to the greatest extent practicable. For example, at Flint Ridge Cave where the proposed alignment would intersect a portion of the cave's surface drainage basin, measures would be taken to prevent the commingling of roadway stormwater and stormwater from undeveloped areas surrounding the cave, which would help preserve the current water quality of the cave's recharge.***

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485	H-47	5.1	HMTs consistent with the OEM are listed as a commitment here; however the statement that "The risk of harm to the Barton Springs salamander from hazardous material spills associated with the proposed SH 45SW would be reduced to **insignificant levels** by the capture and detainment capabilities of the proposed HMTs" would seem to be an overstatement. Spill risk assessment modeling would be necessary to substantiate this statement. Based on modeling done by the City of Austin and published in the Barton Springs Catastrophic Spill Plan, fuel spills in this area have the potential to quickly reach Barton Springs. A more detailed consideration of this potential should be assessed in the DEIS.
486	H-49	5.3	Again, both practicable and no effect are not substantiated by any objective definition or analyses. ***There would be no direct effects to the Barton Springs or Austin blind salamanders resulting from construction and operation of the proposed project. The project would use BMPs that would allow for a TSS removal rate of at least 90 percent. During construction, the BMPs would include erosion controls and sediment controls. The completed project would include facilities to collect and treat runoff prior to discharging it offsite. These treatment structures would be installed as early as practicable in the construction phase to allow for the treatment of construction phase runoff. The project would comply with TCEQ's Edwards Aquifer Rules and TPDES standards. In addition, the project is more than nine miles from Barton Springs. Given all of these facts, the TSS load on the aquifer and Barton Springs would be less than the No- Build alternative. This shows that the project would have no effect on the species or their habitat. These controls limit the potential for cumulative effects, as discussed in the Cumulative Impacts Technical Report***
487	H-57	A.1	Evaluation on BMP alternatives on the basis of "general acceptance by TCEQ and in central Texas as an approved BMP on the proposed project site" does not constitute a verifiable analysis of BMP adequacy. No documentation can be made as to "approvals" and no statements of applicability to the proposed project site can be traced to TCEQ or central Texas.
488	H-64	A.2.1	Referenced Text: Table A.2.1 "***Efficiency of hay bale dikes and mulch socks is cited as 95% from COA 2012a"*** - This information was taken from a powerpoint presentation that was on the City's website. It was authored by a private entity, not the city of Austin. The City of Austin refutes the claim that hay bale and mulch sock efficiency is 95%. Please provide peer reviewed journal article or other published data to support claims of efficiency. Please remove COA, 2012a as a reference.
489	H-65	A.3	This section starts a laundry list of BMPs, descriptions, and schematics that are better left as references than appendix-fodder if possible. In most cases, reference to the COA Environmental Criteria Manual would be better used as a primary source of this information without need to repeat it here.
490	H-65	A.4	As with A.3, this section is a laundry list of BMPs, descriptions, and schematics that are better left as references than appendix-fodder if possible. In most cases, reference to the COA Environmental Criteria Manual would be better used as a primary source of this information without need to repeat it here.
491	H-66	A.3.1	Maximum Extent Practicable is a term under much debate and a discussion of it's meaning in light of EPA guidance and case law is necessary at some point and should referenced here. At a minimum, it belongs in a glossary using some objective definition should be considered ***Natural vegetative buffers should be maintained to the maximum extent practicable (COA, 2013; TCEQ, 2007b)***

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492	H-66	A.3.1.1	Referenced Text: "***Efficacy of silt fence is highly dependent upon the material, load and proper installation and maintenance of the fencing. Data collected during filtering tests on silt fence material indicated silt fence fabric can retain between 71 and 85 percent TSS depending on the fabric size selected and the sediment size distribution (Holloway, 2010). Silt fences cause runoff to pond, allowing heavier solids to settle out. Silt fences are most effective when used as retention BMPs and not relied upon to filter runoff. Proper installation is crucial to effectiveness and inspection should occur frequently, especially after rain events. Silt fences would be carried forward for use in the proposed SH 45SW project, and would be used in situations with flow disruption and water ponding the primary focus of their use as opposed to reliance on their filtering capabilities. A schematic illustration of a silt fence taken from TCEQ, (2005) is shown in Figure A.3-1*** ." - Since it is acknowledged that silt fence performs as a retention BMP, not filtration, please remove reference from Table A.1-2 that provides filter efficiency from the Holloway, 2010 report. Please refer to "An evaluation of geotextiles for temporary sediment control", Barrett et al, 1998 and note that typical TSS concentration from silt fence controls is approximately 500 mg/l. This number should be used in all loading calculations that attempt to quantify to 90% reduction in loadings from construction phase.
493	H-8	3.1.1	A study of pollutants on rooftops adjacent to MoPac north of the Colorado River found significant atmospheric deposition of PAHs, arsenic, chromium, and copper over 300 ft from the road surface (Mahler and Van Metre, 2003). Since 38 acres of the land for the ROW was purchase from blocks of land acquired for water quality protection and adjacent land still has that purpose, the DEIS should address impacts from airborne pollutants from the highway on these lands and how that will be mitigated.
494	I-10	6.3	Replace the statement - "***In the Travis/Hays County area, air quality is managed regionally by the Capital Area Metropolitan Planning Organization in coordination with TxDOT and TCEQ*** ." to read as "In the Travis/Hays County area, air quality is managed regionally by the Capital Area Council of Governments in coordination with EPA and TCEQ."
495	I-26	5.1.2	The extent of the population range of the Austin blind salamander, which is a subterranean cryptic species, is not fully known. The species identification of the Eurycea salamander located west of the project is in question, and may not be Eurycea sosorum.
496	I-27	5.1.2	There is no Bendik and Turner 2000 report. Bendik and Turner 2011 analyses did indicate potential density dependent growth of Barton Springs salamander populations, but it is not accurate to state that this is inconsistent with "populations that are close to extinction." By definition as an endangered species, the populations are on a trend towards extinction.
497	I-27	5.1.2	The statement that there have been no significant increases or decreases in populations of Eurycea at Barton Springs is not accurate. Population changes occur in response to hydrologic conditions, as well as in response to habitat modification and restoration.
498	I-27	5.1.2	The City of Austin did not modify survey protocols in 1998 to look for Austin blind salamanders
499	I-29	5.1.2	Provide a source for the listed impervious cover calculations for 2012.
500	I-29	5.1.2	Cite more recent City of Austin temporal trend analysis for Barton Springs water quality (Herrington and Hiers 2010), which did identify degrading temporal trends in Barton Springs including for nitrogen.
501	I-30	5.1.2	Conclusions on Barton Springs salamander life history referenced from Gillespie 2011 are not accurate. That is one possible life history, and information from Barton Springs salamanders does not directly support that conclusion. Barton Springs salamanders do not have high fecundity, and the statement relating to the possibility that the Barton Springs salamander can rebound from few remaining individuals ignores the genetic bottleneck created by that life history and is not supported by monitoring data.
502	I-31	5.1.2	This section only addresses water quality impacts and does not include water quantity impacts to the endangered salamanders.

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503	I-37	5.2	More than 750,000 people visit Barton Springs annually
504	I-38	5.2	Please check references against the bibliography. Herrington and Hiers was published in 2010.
505	I-50	5.3	The City of Austin collects data from Bear Creek and Slaughter Creek through the Environmental Integrity Index (EII). EII data is available online as well at http://austintexas.gov/department/environmental-integrity-index and at https://data.austintexas.gov/Environmental/Water-Quality-Sampling-Data/5tye-7ray Please note that the Onion Creek data shown from LCRA's website was collected by the City of Austin and provided to LCRA and TCEQ thru the Clean Rivers Program QAPP.
506	I-50	5.3	Graphs show an apparent degrading trend over time for some constituents including dissolved oxygen. Perform a trend analysis and provide equations and r2 values with trend lines shown on graphs.
507	I-50	5.3	Provide a reference to support the statement that "conductance in surface water increases naturally as contact time with soil and stream bed increases…"
508	I-55	5.3	The most recent City of Austin watershed protection ordinance was passed in October 2013.
509	I-55	5.3	Additional bond money for water quality protection lands were approved in 2012.
510	I-55	5.3	The data shown was collected by the City of Austin. Provide statistical analysis to support the claim that these water quality parameters are stable. Dissolved oxygen appears to be decreasing over time from the graphs shown.
511	I-59	5.3	Flow graph should be on log scale to show prevalence of base flow conditions.
512	I-60	5.3	Provide citations and statistical analysis that supports the conclusions that water quality within the RSA is stable, and is influenced by increasing regulatory protection measures.
513	I-61	6.1.2	Because of the loss of quality and quantity of recharge to the aquifer, there are indirect impacts to federally listed endangered species as a result of the proposed project. Any impacts to endangered species constitute take and are significant.
514	I-62	6.1.2	The DEIS only analyzes load reductions for TSS, and thus conclusions that the BMPs will maintain water quality are not supported. Removal rates have only been calculated for TSS, and this should be explicitly stated.
515	I-62	6.2	There are not "potential" reductions in recharge if karst features are directly impacted. These are direct impacts to recharge quantity.
516	I-62	6.2	No quantification of the loss of recharge was provided, and thus the statement that impervious cover as a result of the proposed project would "slightly" reduce recharge is not supported and invalid.
517	I-68	7.0	Were the projects identified in Table 7.3 included in the traffic impact analysis? Please identify which, if any, were included in traffic modeling.
518	I-75	8.3	Any indirect impacts to endangered species are significant. The proposed project will reduce the quality and quantity of recharge to the Edwards Aquifer, and thus could constitute a taking of listed species and require a permit from the US Fish and Wildlife Service

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519	I-75	8.3	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***There would be no direct effects to the Barton Springs and Austin blind salamanders from the proposed project. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected as a result of the project. Reasonably foreseeable projects undertaken within the RSA would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs salamander or the Austin Blind salamander or their habitat.***
520	I-76	8.3	Any indirect impacts to endangered species are significant. The proposed project will reduce the quality and quantity of recharge to the Edwards Aquifer, and thus could constitute a taking of listed species and require a permit from the US Fish and Wildlife Service
521	I-76	8.4	Water quality degradation over time at Barton Springs demonstrates that Edwards Rules are not sufficient to preclude impacts to endangered species and maintain the quality of water in the Edwards Aquifer.
522	I-8	4.0	The project will negatively impact the quantity and quality of water recharging the Edwards Aquifer by increasing impervious cover, increasing the probability of occurrence of hazardous material spills, directly impacting surface drainage areas of karst features and directly impacting subsurface drainage area of karst features. This has a direct impact on endangered salamanders at Barton Springs, and should be included in the analyses of direct impacts. Additionally, the DEIS does not address any subsurface drainage area impacts to affected karst features.
523	I-8	4.0	The DEIS references reports in other sections (see Herrington and Hiers 2010) that document decling water quality in Barton Springs over time that is not included in this table.
524	I-86	9.1.2	This section does not address the loss of recharge through affected karst features and addition of impervious cover over the recharge zone.
525	I-86	9.1.2	Pollutant removal rates were only calculated for TSS, and not for other constituents with lower removal rates that would adversely impact the quality of water recharging the aquifer.
526	I-86	9.2	This section does not address the loss of recharge through affected karst features and addition of impervious cover over the recharge zone.
527	I-87	9.2	Will the project comply with the requirements of both of the cited Optional Enhanced Measures of the Edwards Rules?
528	I-88	9.2	How does impervious cover added by the project within the TXDOT right-of-way (percent of impervious cover within the land owned by TxDOT) in the project area compare to the listed City of Austin regulatory limits?
529	I-88	9.2	The most recent City of Austin watershed protection ordinance was passed in October 2013.
530	I-9	4.0	The DEIS analyzes only TSS removal, and does not quantify impacts for any other constituents even though the DEIS includes tables showing removal efficiencies for some constituents of concern to be lower than the reported TSS removal values.
531	I-9	4.0	Water quality declines have been documented in the Edwards Aquifer. No references are provided in the DEIS stating the Edwards Aquifer water quality is not declining over time. Thus, the statement "The resource is considered by some to be threatened…" is not supported unless references stating that water quality is not declining are provided.
532	I-90	9.3.2	Removal rates for constituents other than TSS are not presented in the DEIS.

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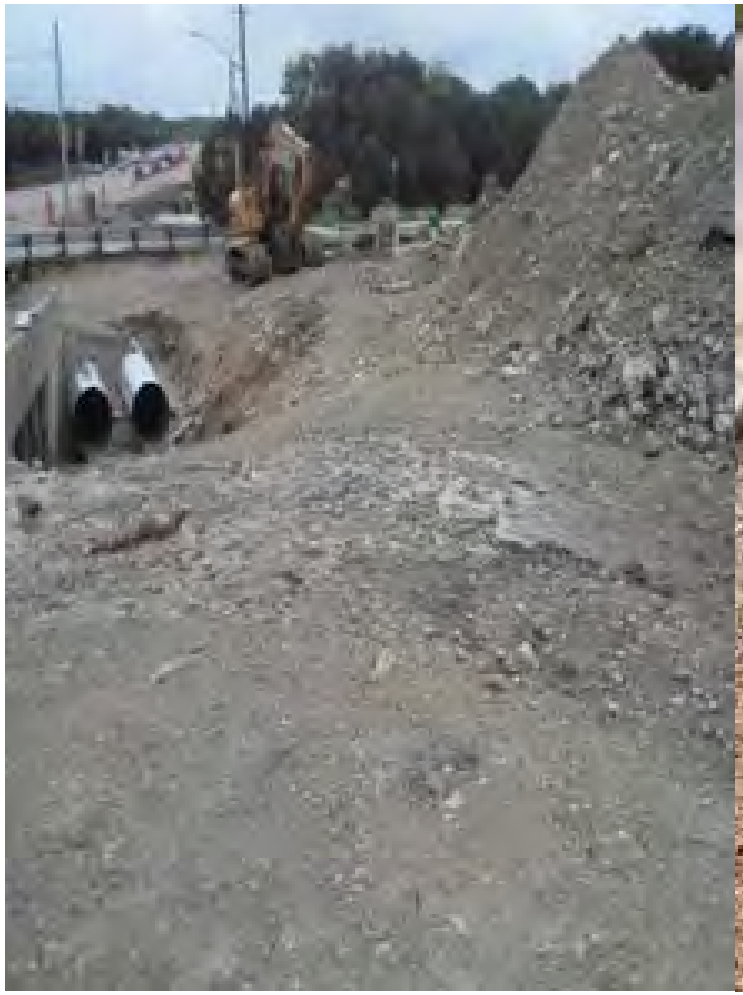
533	I-93	10.0	Due to the lack of quantitative analyses presented in Appendix I as stated in previous comments, the Cumulative Impacts assessment is incomplete and the conclusions stating that impacts will be limited is wholly unsupported. Additionally, there was no consideration of the cumulative impacts of the other planned roadway projects currently underway by TXDOT over the recharge zone of the Edwards Aquifer.
534	I-93	10.0	Significant is also a term of much debate in EIS development and other similar regulations. In TxDOT guidance, this term is defined and the analysis listed below does not provide adequate support for the conclusion of insignificance. ***Based on this analysis, given the limited direct impacts that would be caused by the proposed limited access project with extensive BMPs for before, during, and after construction, and the incremental contribution the proposed roadway would make toward induced development in the AOI, in the context of the continuing trends of land use development and conservation initiatives underway within the RSAs, the proposed project, in conjunction with other past, present, and reasonably foreseeable future projects, may contribute to cumulative impacts but is not likely to cause significant cumulative impacts.***

Attachment
Photos of TxDOT Erosion and Sedimentation BMP Failures
US290 W at ACC Pinnacle 10/13/13



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August 7, 2014

Mr. Doug Booher
Strategic Projects Manager
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483

RE: Texas Department of Transportation (TxDOT) Draft Environmental Impact Statement (DEIS) for State Highway (SH) 45 Southwest (SW) from Loop 1 to Farm-to-Market Road (FM) 1626, Travis and Hays Counties, Texas (CSJ: 1200-06-004 and 1200-07-001)

Dear Mr. Booher:

Texas Parks and Wildlife Department (TPWD) has received the DEIS for the above-referenced project located in Travis and Hays counties. TPWD would like to offer the following information, comments, and recommendations to minimize impacts to fish and wildlife resources.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011, which can be found online at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. For tracking purposes, please refer to TPWD project number ERCS-9352 in any return correspondence regarding this project.

Project Description

The Executive Summary (page ES–1) states that the proposed, non-federally funded project is being developed by TxDOT in conjunction with the Central Texas Regional Mobility Authority. The limits of the proposed project would extend from State Loop 1 (locally known as MoPac) to FM 1626 in southern Travis County and northern Hays County, Texas. The proposed new location, four-lane, limited access tolled facility would be approximately four miles long and is identified in the current Capital Area Metropolitan Planning Organization (CAMPO) *2035 Regional Transportation Plan* (*RTP*). A shared use path would parallel the entire roadway. The width of the right-of-way (ROW) would vary from 300 feet to approximately 600 feet.

Section 2.1 (page 15) in the DEIS states that preliminary alternatives were identified and screened based on their ability to meet the purpose and need. Preliminary alternatives considered include Transportation System Management, Travel Demand Management, the Upgrade One or More Existing Roadways

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Alternative, the New Tollway on New Location Alternative, the New Tollway on Existing State-Owned ROW Alternative, and the No Build Alternative.

The analysis of these preliminary alternatives in Section 2.2.5 (page 21) of the DEIS concludes with the following statement:

> *A new roadway constructed on existing state-owned ROW would meet the purpose and need of the proposed project by providing critical system linkage in the local network. It would also provide an alternative route to congested local roadways, which would improve local mobility and travel times. This alternative would not require the acquisition of new ROW, would not directly affect Water Quality Protection Lands (WQPLs), and would not require any residential relocations or commercial displacements.*
>
> *Further, this alternative is consistent with regional planning that has occurred over nearly three decades. These efforts are evidenced by the acquisition of ROW for SH 45SW (acquired by Travis and Hays Counties under approvals granted through the 1989 EIS) and continued inclusion of the proposed project in the CAMPO long range transportation plans. For these reasons, this alternative was carried forward for detailed analysis.*

Previous Coordination

TPWD provided information and recommendations regarding the SH 45SW study area to TxDOT on September 9, 2013. This response was not included in Appendix K of the DEIS; therefore, it is attached for your reference.

> **Recommendation:** Please review previous TPWD correspondence and consider the recommendations provided, as they remain applicable to the project as proposed but are not repeated in this letter. TPWD also recommends including this coordination letter in Appendix K of the Final EIS (FEIS).

Impacts to Vegetation/Wildlife Habitat

Section 6.6.1 (page 313) of the DEIS states that of the approximately 309 acres of vegetation within the proposed project ROW, 159 acres would be impacted either permanently or temporarily under the Build Alternative through the laying of new pavement, clearing of trees and brush, and construction equipment staging areas. According to the Ecological Mapping Systems of Texas (EMST), the majority of the habitat impacted within the ROW is Deciduous Oak/Evergreen Motte and Woodlands of the Edwards Plateau. Approximately 3 acres of riparian and floodplain vegetation would be impacted by the proposed project. Upon completion of construction activities associated with the proposed project, disturbed areas would be restored and seeded according to TxDOT's *Vegetation*

Management Guidelines. The DEIS did not discuss plans to mitigate for vegetation removal.

Recommendation: TPWD identifies the SH 45SW state resource habitat impacts as impacts that deserve special consideration during the Interagency Memorandum of Understanding (MOU) Implementation Team review of the state-wide aggregated impacts for the purpose of mitigation for those impacts. Special consideration should be provided based on the quantity of impacts occurring as a result of one project, the increase in impacts to adjacent undeveloped property due to new access as a result of the proposed roadway, and the mid-to-high quality of the habitat being directly impacted. Impacted MOU habitat types as a result of the proposed project include Edwards Plateau Savanna Woodland and Shrubland (129.84 acres), riparian and floodplain vegetation (3.1 acres), and Disturbed Prairie (6.6 acres). TPWD recommends coordinating vegetation mitigation efforts with this office.

Recommendation: TxDOT's *Vegetation Management Guidelines* are not provided in the DEIS for review. As a precautionary measure, TPWD discourages the use of any non-native vegetation in landscaping and revegetation and recommends using locally adapted native species. If the seed mix outlined in TxDOT's *Vegetation Management Guidelines* contains any seeds from non-native plants, TPWD recommends using a seed mix that contains seeds from only locally adapted native species. Lists of invasive species to avoid can be accessed online at http://www.texasinvasives.org/.

Federally Listed Species

Golden-cheeked Warbler (Setophaga chrysoparia)

The Executive Summary (pages ES–13 and ES–14) states "Golden-cheeked Warbler habitat assessments and presence/absence surveys were conducted within the state-owned ROW in the spring of 2014. Presence/absence surveys were conducted using Golden-cheeked Warbler and Screech Owl calls on the final survey to elicit a response per USFWS [U.S. Fish and Wildlife Service] guidelines. Survey results were negative for suitable habitat and the presence of the species within the state-owned ROW (SWCA, 2014). Further, there have been no sightings of Golden-cheeked Warblers within the state-owned ROW."

Recommendation: The above-mentioned guidelines (*USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys and Habitat Assessments for Endangered Golden-cheeked Warblers)* outline very detailed processes for surveys and reporting. These guidelines require that habitat assessment reports be submitted to the USFWS if the assessed area meets any of the vegetation associations outlined as potential Golden-cheeked Warbler habitat as stated in the guidelines. The DEIS states

in several places that the study area contains potential suitable habitat for this species (discussed below), so TPWD assumes the assessed area meets one of the vegetation associations outlined in the USFWS guidelines. Therefore, TPWD assumes that a habitat assessment report and presence/absence survey report were prepared and submitted to the USFWS for this project. TPWD recommends TxDOT attach those reports as an appendix in the FEIS.

The DEIS describes the study area as containing potential suitable habitat for the Golden-cheeked Warbler and mentions several Golden-cheeked Warbler observations that were documented within the study area. Examples within the DEIS of descriptions of suitable habitat and Golden-cheeked Warbler observations are as follows:

- Table 3.8–2 (page 223) in the column labeled "Potential for habitat to occur in the study area" states "Yes – Oak-juniper woodlands occur within the study area."
- Section 3.8.1 (page 230) states "Based on available data, Golden-cheeked Warbler presence/absence surveys have been completed within portions of the study area. In 2003, SWCA Environmental Consultants (SWCA) surveyed areas of potential habitat in the vicinity of Bear Creek. An "apparently unmated male warbler" was observed during the first three presence/absence surveys to the west of the proposed ROW, but not the last three. The 2003 results stated that the Golden-cheeked Warbler "was believed to have abandoned the area" (SWCA, 2003). Figures provided by SWCA from a letter report produced in 2013 indicate that Golden-cheeked Warblers were heard on [City of Austin] COA WQPL lands within the study area south of Bear Creek to the south of Shady Hollow Estates and east of Bear Creek to the west of Shady Hollow Estates (SWCA, 2013). These surveys did not cover the existing state-owned ROW."
- Section 3.8.1 (page 230) states "Texas A&M University used a model (Texas A&M, 2010a) to estimate the amount of Golden-cheeked Warbler habitat remaining within Texas. Based on a review of the results as well as a review of recent aerial photography and survey observations, there are approximately 2,010 acres of potential Golden-cheeked Warbler habitat available within the study area. Data from Texas Natural Diversity Database (TXNDD) and other studies indicate that there have been Golden-cheeked Warbler sightings within the study area (TXNDD, 2013; City of Austin, 2011). There is oak-juniper woodland habitat found throughout the study area."
- Section 3.8.2 (page 251) states "Habitat sharing some of the basic characteristics of Golden-cheeked Warbler habitat was observed within the existing state-owned ROW during field surveys conducted in 2013. Golden-cheeked Warblers have been sighted immediately adjacent to the ROW during recent COA surveys (SWCA, 2013)."

- Section 3.8.3 (page 255) states "The closest known confirmed sighting of Golden-cheeked Warblers to the state-owned ROW is separated from the proposed project by an LCRA utility easement. This easement runs immediately adjacent to the proposed project ROW in this area. Therefore, there is already edge habitat separating the area of this sighting from the state-owned ROW. Based on figures from a 2013 presence/absence survey (SWCA, 2013) there are two more known sightings of Golden-cheeked Warblers to the west of the state-owned ROW, but they are over 600 feet away from the western boundary of the ROW. Therefore the existing data seem to indicate that edge habitat created by the proposed project would not negatively affect Golden-cheeked Warblers."
- The caption on Photo 7 in Appendix G (Study Area Photographs) states "potential Golden-cheeked Warbler habitat."

Recommendation: After a review of project photographs, aerial photographs, habitat descriptions in the DEIS, the number of observations recorded in the study area, the TXNDD, and a predictive habitat model for the Golden-cheeked Warbler (Diamond, 2007), TPWD finds no evidence that suitable habitat for the Golden-cheeked Warbler is absent within the state-owned ROW. The DEIS does not provide clear reasoning why the suitable habitat survey results were determined to be negative within the ROW. Based on the available information, TPWD finds no difference between the habitat in the ROW and the occupied or previously occupied habitat in the remainder of the study area. TPWD recommends TxDOT further explain this determination in the FEIS.

Recommendation: Several Golden-cheeked Warbler observations are mentioned throughout the DEIS that were observed during various surveys performed by SWCA and the COA. TPWD recommends that SWCA and the COA submit these observations to the TXNDD if they have not done so to date. SWCA and the COA can report these observations by completing and submitting a TXNDD reporting form which can be found online at http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/txndd/submit.phtml. The TXNDD staff can be contacted at TexasNatural.DiversityDatabase@tpwd.texas.gov or (512) 389-8744.

Barton Springs salamander (Eurycea sosorum)

Section 3.8.1 (page 229) in the DEIS provides the following statement regarding the Barton Springs salamander:

The Barton Springs salamander was until recently only known from spring outlets in Barton Springs. However, in 2009 one individual of the species was reported at a site approximately 6.5 miles southwest of Barton Springs

[Blowing Sink], though this sighting has not yet been confirmed by USFWS (TXNDD, 2013). In 2012, researchers collected Eurycea sp. salamanders from a spring outlet along Bear Creek approximately two miles west of the proposed alignment (A. Gluesenkamp, personal communication, February 26, 2014). The taxonomic identity of the salamanders in both observations discussed above has yet to be conclusively determined. Therefore, discussion involving the Barton Springs salamander in this document will focus exclusively on the species as it exists within Barton Springs. It appears that this species occurs primarily in non-subterranean waters, usually under rocks or gravel near spring outlets. Like the Austin blind salamander, this species is highly dependent on the water quality of Barton Springs. There is no known spring habitat or subterranean aquatic habitat within karst features for the Barton Springs salamander within the study area. Therefore, this species is not expected to occur within the study area.

TPWD does not concur with the above statement regarding the Barton Springs salamander. The attached Section 6 TX E-122-R Final Report: *Status of newly discovered cave and spring salamanders (Eurycea) in southern Travis and northern Hays Counties* states the following:

The populations of Eurycea at Blowing Sink and Cold Spring (and Spillar Ranch and Taylor Springs) are indistinguishable mitochondrially from the "nana-like" haplotype group at Barton Springs. They share nuclear sequence substitutions or alleles, and microsatellite alleles, with E. sosorum that are rare or undetected in E. nana. Although there is evidence that this group – Barton Spring, Cold Spring, and Blowing Sink – may not be completely panmictic (randomly interbreeding), they appear to represent the same species, and population genetic analyses of the microsatellite data reveal substantial to very high levels of gene flow, especially between Barton Springs and both Cold Spring and Blowing Sink (although gene flow appears to be toward Barton Springs, in that the E. sosorum – specific mitochondrial haplotype was not seen in these populations). Spillar Ranch exhibits less nuclear variation overall, but its nuclear genetic composition is consistent with that of E. sosorum and not E. nana. The Taylor Springs population is somewhat problematic; it appears to be small and isolated, with a very low level of genetic variation and little evidence of ongoing genetic exchange with any of the other populations or species. However, its genetic composition is also most consistent with that of E. sosorum and the other populations, exclusive of E. nana.

Recommendation: Please note that the above-mentioned populations found at Spillar Ranch Spring are located approximately 2,480 feet outside of the study area boundary. TPWD recommends revising the DEIS text to include above-mentioned populations of *Eurycea sosorum* and address potential impacts to these populations in addition to the populations found at Barton

Springs. The above-mentioned *Eurycea sosorum* observations have been added to the TXNDD since the completion of the DEIS. TPWD recommends requesting the most current TXNDD data before the preparation of the FEIS and updating the document accordingly.

TPWD notes that the USFWS works cooperatively with species experts like the State Herpetologist, Dr. Andy Gluesenkamp, as well as Dr. Hillis and Dr. Chippindale, on species identifications. USFWS acknowledgement of identifications made by taxon experts may lag by years and, often, only comes after peer-reviewed papers have been published. Lack of USFWS confirmation of species identification does not necessarily indicate that the taxonomy is undetermined.

Recommendation: Dr. Gluesenkamp believes that the above-mentioned personal communication was inaccurately interpreted in the DEIS. TPWD recommends contacting Andy Gluesenkamp at Andy.Gluesenkamp@tpwd.texas.gov to resolve this statement and revise accordingly for its inclusion in the FEIS.

Section 3.6.2 (page 160) in the DEIS states "no springs are mapped in the study area by the Texas Water Development Board (TWDB, 2013)." Additionally, no springs were observed in the state-owned ROW during field surveys.

Recommendation: Given the proximity of Spillar Ranch Spring and known populations of *Eurycea sosorum* as concluded in the above-mentioned Section 6 report, TPWD recommends TxDOT also contact the Texas Speleological Survey to formally request data on known caves, karst features, springs, and karst dwelling species in order to receive the most accurate data on such features.

Bracted twistflower (Streptanthus bracteatus) – Federal Candidate for Listing

The DEIS does not include the Bracted twistflower in Table 3.8–2 (Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties) or Table 3.8–5 (Potential for Take/Impacts to Threatened and Endangered Species). This species inhabits Oak-juniper woodlands and associated openings on slopes and in canyon bottoms with shallow, well drained, gravelly clays and clay loams over limestone. The Bracted twistflower is often found amid dense shrub growth where some protection for browsing animals is afforded.

The Bracted twistflower is endemic to south-central Texas, with many of the occurrences in rapidly developing urban areas. Several sites have been extirpated by housing developments. Browsing pressure has increased due to the introduction of domestic and exotic animals as well as an overabundance of white-tailed deer, particularly in urban areas (NatureServe, 2014).

After a review of habitat descriptions in the DEIS, the project location, project photographs, and aerial photographs, it appears that suitable habitat for this species may occur within the study area.

Recommendation: TPWD recommends TxDOT revise the DEIS to include the Bracted twistflower in the above-mentioned tables as well as a discussion of potential impacts. TPWD also recommends the project area be surveyed by a qualified biologist familiar with the identification of this species during its mid-April to late-May flowering period, prior to construction. If plants are found in the path of construction, including the placement of staging areas and other project related sites, this office should be contacted for further coordination and possible salvage of plants and/or seeds for seed banking. Plants not in the direct path of construction should be protected by markers or fencing and by instructing construction crews to avoid any harm.

Table 3.8–2 Federally and State Listed Species of Potential Occurrence in Hays and Travis Counties

Table 3.8–2 in the DEIS lists Peck's cave amphipod (*Stygobromus pecki*) as federally endangered in Travis and/or Hays County. Please note that this species is believed to occur in Comal County, but not in Travis or Hays counties. Table 3.8–2 in the DEIS does not include a federal listing designation for the Texas fatmucket (*Lampsilis bracteata*), Smooth pimpleback (*Quadrula houstonensis*), Texas pimpleback (*Quadrula petrina*), Golden orb (*Quadrula aurea*), or the Texas fawnsfoot (*Truncilla macrodon*). Please note that these species are designated as federal candidates for listing. Please also note that Sprague's Pipit (*Anthus spragueii*) is listed as a Species of Greatest Conservation Need in Table 3.8–3. This species is also designated as a federal candidate for listing.

Recommendation: TPWD recommends revising Tables 3.8–2 and 3.8–3 accordingly to reflect the correct listing designations for the above-mentioned species.

Species of Greatest Conservation Need (SGCN)

Invertebrates

Table 3.8–3 in the DEIS states that the Edwards Aquifer diving beetle (*Haideoporus texanus*) and the Ezell's cave amphipod (*Stygobromus flagellatus*) may occur in subterranean caves and pools beneath the study area; however, they are listed as not having the potential for habitat to occur within the study area. Table 3.8–6 in the DEIS then states that the Edwards Aquifer diving beetle and the Ezell's cave amphipod do have habitat present within the study area and that the proposed project will have no impact on these species.

Recommendation: TPWD recommends TxDOT resolve the discrepancy between Table 3.8–3 and Table 3.8-6 and state whether there is suitable habitat for the Edwards Aquifer diving beetle and the Ezell's cave amphipod in the study area. Based on that determination, TPWD recommends TxDOT determine whether the project has the potential to impact these species.

Section 3.8.2 (pages 253 and 254) in the DEIS states "The proposed project has the potential to impact several SGCN species by affecting potentially suitable habitat present within the proposed project ROW. However, based on TXNDD data, none of these species are known to have been recorded within the proposed project ROW."

Recommendation: TPWD notes that the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within the project area. These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in the project area. This information cannot be substituted for on-the-ground surveys. TPWD recommends TxDOT include a statement in the document conveying that the TXNDD data cannot be used as presence/absence data.

Section 3.8.2 (page 254) also states "Based on best currently available karst information (Veni, 2007; aci, 2007), the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state-owned ROW. A karst survey conducted by a qualified geologist is currently being conducted to verify this information. Mitigation for SGCNs would not be required as there are no official federal or state regulations protecting these species. Therefore, no further action on impacts to these species is required. However, Best Management Practices (BMPs) put in place to protect water quality would likely also protect the majority of the potentially impacted SGCNs."

Recommendation: As previously mentioned, TPWD recommends TxDOT also contact the Texas Speleological Survey to formally request data on known caves, karst features, springs, and karst dwelling species in order to receive the most accurate data on such features.

Comment: TPWD notes that the proposed project is likely to impact karst invertebrates. At a minimum, some runoff into caves and streams will occur during high flow events. Design plans and the implementation of water quality BMPs attempt to minimize this impact, but it is likely that there will be

some impact. It is also likely that SGCN surface invertebrates will be impacted by vehicle collisions, as these surface species all have flying adult forms.

Recommendation: As previously mentioned, the DEIS states that based on best currently available karst information, the project area is located in Karst Zones 3 and 4; therefore, karst invertebrates are not expected to occur within the state-owned ROW. TPWD notes that designation of the area as Karst Zones 3 and 4 indicates that the area probably does not contain **listed** karst invertebrates but does not indicate the absence of karst-dependent SGCN. Table 3.8–3 in the DEIS also states that the Cave bandit spider (*Cicurina bandida*), an SGCN, is known from Flint Ridge Cave, which is located 150 feet outside of the state-owned ROW. It is unclear to TPWD why karst invertebrates are not expected to be found within the state-owned ROW when there are known observations just outside the ROW. TPWD recommends TxDOT further explain the reasoning behind this statement.

Plants

Table 3.8–3 in the DEIS states that there is potential for habitat to occur in the study area for the Basin bellflower (*Campanula reverchonii*), Boerne bean (*Phaseolus texensis*), Correll's false dragonhead (*Physostegia correllii*), Hill Country wild mercury (*Argythamnia aphoroides*), Texabama croton (*Croton alabamensis* var *texensis*), and Warnock's coral-root (*Hexalectris warnockii*) , and Table 3.8–6 states that the proposed project "may impact" these species. Section 3.8.1 (page 238) in the DEIS also states "Plant SGCNs have the potential to occur in the undeveloped portions of the study area."

Recommendation: TPWD recommends that the project area be surveyed for the above-listed SGCN plant species. On-the-ground surveys should be performed by a qualified biologist familiar with the identification of these species prior to construction. Surveys should be conducted when these species are most detectable and identifiable (usually during the flowering period), and disturbance of these species should be avoided during construction to the extent feasible. If plants are found in the path of construction, including the placement of staging areas and other project related sites, TPWD requests TxDOT contact this office for further coordination and possible salvage of plants and/or seeds for seed banking. TPWD recommends plants not in the direct path of construction be protected by markers or fencing and by instructing construction crews to avoid any harm.

Reptiles

Table 3.8–3 in the DEIS states that there is appropriate habitat within the study area for the Texas garter snake (*Thamnophis sirtalis annectens*) and Table 3.8–6 states that the proposed project "may impact" this species.

> **Recommendation:** TPWD recommends construction personnel be advised to avoid impacts to this snake as it is non-venomous and poses no threat to humans. Contractors should avoid contact with this species if encountered and allow the snake to safely leave the premises.

Table 3.8–3 in the DEIS states that there is potential habitat (brushland habitat) within the study area for the Spot-tailed earless lizard (*Holbrookia lacerata*); however, Table 3.8–6 states that there is no habitat and that the project will not impact this species. After a review of the TXNDD, habitat descriptions in the DEIS, project location, project photographs, and aerial photographs, it appears that suitable habitat for this species may occur within the study area.

> **Recommendation:** TPWD recommends TxDOT resolve the discrepancy between Table 3.8–3 and Table 3.8-6 and state whether there is suitable habitat for the Spot-tailed earless lizard in the study area. Based on that determination, TPWD recommends TxDOT determine whether the project has the potential to impact this species. TPWD also recommends TxDOT monitor the listing status of the Spot-tailed earless lizard throughout project planning and construction and perform required consultation, permitting, and mitigation with the USFWS if this species becomes listed under the Endangered Species Act. TPWD also recommends TxDOT avoid impacts to this species if encountered during construction.

Bats

Table 3.8–3 states that there is suitable habitat (limestone caves) within the study area for the Cave myotis bat (*Myotis velifer*) and Table 3.8–6 states that the proposed project "may impact" this species. TPWD notes that this species also roosts in rock crevices, old buildings, carports, under bridges, and in abandoned Cliff Swallow (*Petrochelidon pyrrhonota*) nests. Section 3.8.2 (page 245) in the DEIS states that a Barn Swallow's (*Hirundo rustica)* nest was observed in a culvert within the proposed project ROW during the December 2013 site visit. This culvert would not be impacted by the proposed project. Cliff swallow nests were also observed in additional surveys. These nests were observed to be inactive at the time of the surveys. TPWD also notes that the study area may contain suitable habitat for other bat species, such as the Brazilian free-tailed bat (*Tadarida brasiliensis*).

Section 6.6.1 (page 313) in the DEIS states "Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable, and to avoid the potential to disturb any breeding Cave myotis bats. No bats were observed during the field surveys in December 2013. Prior to any construction activities, particular attention would be paid to the potential for birds and bats to be roosting in culverts and under bridges."

Recommendation: TPWD recommends that the project area be surveyed for use by bats prior to construction. TPWD also recommends that bat-friendly roosting features be incorporated into the design of the new bridges being proposed by this project to help reduce impacts to these species that may be caused by loss of habitat. Alternately, if the incorporation of bat-friendly roosting features is not feasible, TPWD recommends TxDOT install artificial roost structures such as bat houses on or near the bridge structures. For information on how to create bat roosts in highway structures, TPWD recommends reviewing *Bats in American Bridges* which was developed by Bat Conservation International and can be found online at http://www.batcon.org/pdfs/bridges/BatsBridges2.pdf.

Water Resources

TPWD offers the following comments related to the potential impacts to water quality and quantity of the Edwards Aquifer and associated karst ecosystems.

Water quality studies cited in the DEIS showed a connection between recharge and discharge at Barton Springs. Section 3.6.1 (page 139) in the DEIS states "Despite the overall good water quality of Barton Springs, the presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water detected by researchers over the past few decades signify potential effects of growing regional urbanization on aquifer water quality." TPWD notes that rainfall does influence time within the aquifer and the quality of water discharged.

Recommendation: TPWD recommends that special attention be paid to runoff into the recharge areas during the entire process of construction, including pre-construction, during construction, and post-construction.

Contaminants in karst systems are mobile and persistent and often difficult to detect. Point source contamination (such as spills) and non-point source contamination present different concerns. Non-point source contamination, such as runoff from roadways, is perhaps the most difficult to ameliorate. In addition, there will likely be an increase in nutrients associated with new development that occurs along the newly constructed roadway. TPWD has concerns regarding the potential cumulative impacts that will likely further impact aquifer water quality

and in turn threaten highly sensitive karst ecosystems including those associated with Barton Springs.

Point source contamination is likely to travel towards a spring in the form of a relatively narrow plume. Detecting such a plume is difficult without continuous monitoring, making it very difficult to ameliorate the effects of such a plume before the spring habitat is affected. Although a Water Pollution Abatement Plan (WPAP) will be submitted, technical details are not included in the DEIS. Section 3.6.2 (page 161) in the DEIS states that the use of BMPs in series will remove 90 percent of pollutants over the Recharge Zone and the remaining 10 percent would be diluted by the Edwards Aquifer. While TPWD supports the use of BMPs as described in the DEIS, a detailed Water WPAP including a final design and description of features, as well as how the features will be maintained in the future, is needed.

> **Recommendation:** TPWD requests that TxDOT provide the WPAP to this office for review. Furthermore, a completed Geologic Assessment, a key component to addressing concerns within karst regions, is needed to properly assess the potential impacts of the project.

Section 3.3.2 (page 104) in the DEIS states that the effects of the proposed project, including construction activities, would directly impact the openings of seven karst features. Four of these are described as potentially sensitive. The DEIS states that berming and/or backfilling to permanently seal the features is recommended to prevent impacts to water quality. Flint Ridge Cave is a significant recharge feature that has its surface opening located approximately 150 feet outside of the state-owned ROW and that a portion of the drainage area of the cave is within the state-owned ROW. Page 159 in the DEIS states that encroachment of impervious roadway cover on the drainage basin could result in a "decrease in water volume, resulting in potential drying of the cave environment and impacts to troglobites or aquifer-dependent species, as well as in a loss of recharge to the underlying Edwards Aquifer."

> **Comment:** While these may be effective methods for guarding against contamination of the aquifer, TPWD has concerns that steps to protect water quality may negatively impact karst ecosystems within the features.

The following recommendations discuss information provided in Section 3.6.2 of the DEIS. Page 140 states that within the state-owned ROW, approximately 277.4 acres lie over the Recharge Zone and 31.7 acres lie over the Transition Zone. Overall, the analyses indicate that the proposed project would have a negligible impact to recharge or spring flows because the increase in impervious cover is minor (47.9 acres over the Recharge Zone), and the proposed project would include BMPs that would collect and treat runoff prior to discharging it off-site.

Recommendation: It is unclear to TPWD why 47.9 acres of impervious cover over the Recharge Zone would be considered minor in an area that is approximately 277.4 acres. TPWD recommends TxDOT further explain in the FEIS the basis for this statement.

Page 141 states that an Environmental Compliance Management Plan (ECMP) would be developed with water quality-specific guidelines and trained personnel to ensure its success.

Recommendation: TPWD respectfully requests that TxDOT send the above-mentioned ECMP to this office for review and comment once a draft has been prepared.

Pages 152, 158, and 160 discuss the proposed water quality ponds to be constructed for this project. Water quality ponds would be used to capture runoff and remove Total Suspended Solids (TSS) and other pollutants. These ponds may include batch detention ponds, sedimentation ponds, or sand filter systems; the DEIS states that although the proposed project would add new impervious cover over the Recharge Zone, as proposed, stormwater generated from the road would be treated through water quality ponds and then released over time (after any single event, the water would be retained for a minimum of 12 hours and released over a 48-hour period) to recharge back into the aquifer.

Recommendation: The long term maintenance plans for the above-mentioned proposed water quality ponds were not discussed in the DEIS. TPWD recommends including these plans in one or both of the supporting environmental documents being prepared for this project (WPAP or the ECMP).

Page 152 states that water would be released from ponds in a slow release such that velocity would be controlled. In this way, stormwater runoff velocities would be reduced prior to release to receiving waters, therefore reducing streambank erosion along receiving waters.

Comment: TPWD notes that slow release of water from water quality ponds is also important to reduce erosion at the discharge site, in addition to reducing streambank erosion along receiving waters.

Page 152 states that water quality ponds would also function as hazardous materials traps and contain potential hazardous materials in the event of a spill.

Recommendation: TPWD recommends designing the water quality ponds with the ability to shut off the discharge into the creeks in the event that hazardous materials enter the ponds. TPWD recommends including this

information in one or both of the supporting environmental documents being prepared for this project (WPAP or the ECMP).

Section 3.8.2 (page 244) in the DEIS states that Bear Creek is the only water body indicated on published maps as being perennial in the proposed project area (though it has been observed to be intermittent with perennial pools).

Recommendation: TPWD notes that the above-mentioned statement contradicts other sections of the DEIS that state Bear Creek is intermittent. TCEQ describes the creek as intermittent with perennial pools. TPWD recommends TxDOT revise the document for consistency in describing Bear Creek.

Appendix H: *Water Quality and Aquatic Resource Protection Technical Report*

Page H–31 states that final void protection measures would be prescribed after the completion of the geological assessment and would be dependent upon the void descriptions (e.g., sinkhole, sensitive feature, cave). Protective measures including temporary and permanent BMPs would be evaluated based on the specific feature and the location of that feature with respect to construction activities.

Recommendation: TPWD recommends TxDOT consult this office once the final geologic study is completed. TPWD would like to be part of the discussion regarding final void protection measures.

Page H–33 states that where protection of the feature is not an option, for example where alternate alignments or configurations are not practicable and the alignment goes over a feature, such features should be evaluated for closure or mitigation. These determinations would be made during the planning phase of the proposed project.

Recommendation: TPWD recommends TxDOT consult with TPWD during the planning phase of the project if closure or mitigation of a karst feature is necessary.

Page H–45 states "The treatment of stormwater runoff and the reduction of sediment loading through TSS removal would mitigate the threats to sensitive aquatic resources such as the Barton Springs salamander."

Comment: TPWD does not concur with this statement and does not consider treatment of stormwater runoff and the reduction of sediment loading through TSS removal sufficient mitigation for threats to sensitive aquatic species. As previously mentioned, at a minimum, some runoff into caves and streams will occur during high flow events. Design plans and the implementation of water

quality BMPs attempt to minimize this impact, but it is likely that there will be some impact.

Page H–46 states that these ponds (water quality ponds) would capture roadway runoff, including hazardous material spills, from all portions of the roadway except in certain small areas in intersections where it is not practicable to establish grades that would allow draining runoff to Hazardous Material Traps (HMTs). Page H–47 states that the Barton Springs Salamander Recovery Plan (USFWS, 2005a) identifies hazardous materials spills on bridges as being of particular concern because of the high recharge potential associated with creeks. Current design would allow for total capture of runoff from bridge surfaces. This would allow for the detainment of hazardous material spills and prevention of contaminated water recharging to the aquifer.

Recommendation: It is unclear to TPWD what would happen to roadway runoff at the above-mentioned intersections where HMTs cannot be constructed. The DEIS does not address how these intersections meet the requirements of the Barton Springs Salamander Recovery Plan if a hazardous material spill occurs near a bridge or other grades without stormwater capture. TPWD recommends addressing this concern in the FEIS.

TPWD advises review and implementation of these recommendations. Because studies that are needed to evaluate potential impacts of the proposed project were not complete when this DEIS was released (e.g. karst survey, geologic assessment), TPWD respectfully requests TxDOT revise the DEIS based on public comments and provide TPWD an updated DEIS for review. TPWD requests the opportunity to review and comment on the project once information from the current karst survey and geologic assessment have been completed and incorporated into the DEIS, and before the FEIS is prepared. If you have any questions, please contact Jessica Schmerler at (512) 389-8054 or Jessica.Schmerler@tpwd.texas.gov.

Sincerely,

Julie C. Wicker

Julie C. Wicker
Wildlife Habitat Assessment Program Leader
Wildlife Division

JES:gg.ERCS-9352

Attachments (2)

References

Diamond, et al. 2007. *Range-wide Modeling of Golden-cheeked Warbler Habitat.* Section 6 Project E-72-R, Final Report, Texas Parks and Wildlife Department, Austin, Texas

NatureServe, 2014: http://explorer.natureserve.org/servlet/NatureServe?searchName=Streptanthus+bracteatus)

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Wimberley

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Chairman-Emeritus
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Carter P. Smith
Executive Director

September 9, 2013

Mr. Doug Booher
Strategic Projects Manager
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483

RE: Texas Department of Transportation (TxDOT) information request for the proposed State Highway (SH) 45SW Project, Travis and Hays Counties, Texas

Dear Mr. Booher:

Texas Parks and Wildlife Department (TPWD) has received the information request for the above-referenced project located in Travis and Hays Counties. TPWD would like to offer the following information, comments, and recommendations to minimize impacts to fish and wildlife resources.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011, which can be found online at http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011. For tracking purposes, please refer to TPWD project number ERCS-7307 in any return correspondence regarding this project.

Project Description

TxDOT in conjunction with the Central Texas Regional Mobility Authority (CTRMA) is preparing an Environmental Impact Statement (EIS) for the proposed SH 45SW project. The proposed roadway project consists of the construction of SH 45SW from State Loop 1 (MoPac) to FM 1626 through Travis and Hays counties and will be on new location. The roadway is proposed to be a four-lane toll freeway between MoPac and FM 1626 and would be approximately 4 miles in length.

Impacts to Vegetation/Wildlife Habitat

Due to the fact that the project will be on new location, vegetation impacts are anticipated as a result of the proposed project.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

Recommendation: TPWD recommends clearing the least amount of vegetation possible for the construction of this project, especially undisturbed native vegetation and mature trees. TPWD recommends in-kind on-site replacement/restoration of the native vegetation wherever practicable. If on-site mitigation for tree removal is not practicable, TPWD recommends off-site mitigation for removed trees. There are several parks managed by the City of Austin and Travis County located adjacent to the project area that would be appropriate locations to mitigate for tree removal. Examples of nearby parks include Old San Antonio Park, Bauerle Ranch Park, Mary Moore Searight Park, Manchaca Gardens Park, as well as several others.

To minimize adverse effects, activities should be planned to preserve any mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation are high value to wildlife as food and cover. TPWD generally recommends that trees greater than 12-inches in diameter-at-breast-height (dbh) to be removed be replaced at a ratio of three trees for every one (3:1) lost to the extent practicable, either on-site or off-site. Trees less than 12-inches in dbh should be replaced at a 1:1 ratio. Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species. A three to five year maintenance plan that ensures an 85 percent survival rate should be developed for the replacement trees.

Onion Creek and several of its tributaries including Bear Creek and Little Bear Creek are located within the study area. There are also several wetlands and depressional wetland ponds within the study area. These water crossings and wetlands are shown on the attached Water Resources map.

Removal of vegetation along stream systems and wetlands can be damaging to fish and wildlife habitat and to natural processes associated with these systems. Vegetation associated with forested stream systems usually reflects wildlife habitats with the highest value. The degree of adverse impact to habitat resulting from this vegetation loss relates directly to the quantity of the vegetation loss and quality of the vegetation assemblage in fulfilling life requisites of those organisms using it.

Recommendation: Riparian vegetation associated with streams and wetlands acts as a natural buffer and should remain undisturbed to the extent feasible to help protect water quality and preserve wildlife cover, food sources, and travel corridors. TPWD recommends that TxDOT route the proposed project in an area that would have the lowest impact on water crossings and wetlands as well as associated riparian habitat. If wetland or

stream impacts cannot be avoided, TPWD requests that TxDOT mitigate for any wetland and stream impacts and prepare a wetland mitigation plan. The wetland mitigation plan should be developed in consultation with TPWD.

Water Resources (Edwards Aquifer)

The study area is located within the Edwards Aquifer Recharge Zone. The recharge zone is a 1,250 square mile area where highly faulted and fractured Edwards limestones outcrop at the land surface, allowing large quantities of water to flow into the aquifer. In the recharge zone there are no other rock formations overlying the Edwards, so it is exposed at the surface. The aquifer here is "unconfined" and has a water table that rises and falls in response to rainfall. Within the recharge zone, the aquifer is fed both from streams and from direct infiltration through karst limestone openings. These openings may be visible at the surface or hidden beneath thin soil coverings. Because there is little opportunity to capture released pollutants, and because of the hidden location and orientation of the subsurface conduits, the aquifer is even more vulnerable to pollution from activities on the recharge zone.

Recommendation: TPWD recommends TxDOT ensure that precipitation runoff, which could potentially carry pollutants, is intercepted and treated before reaching sensitive recharge features on and off the project site by installing storm water Best Management Practices (BMPs). TPWD recommends installing erosion and sediment control BMPs that would aide in construction stabilization. Erosion and sediment control measures include temporary or permanent seeding (with native plants), mulching, earth dikes, silt fences, sediment traps, and sediment basins. Examples of post-construction BMPs include vegetation systems (biofilters) such as grass filter strips and vegetated swales as well as retention basins capable of treating the additional runoff that would occur from the increase in impervious cover.

A Water Pollution Abatement Plan (WPAP) for the proposed project may be required by the Texas Commission on Environmental Quality (TCEQ). Additional information on WPAP requirements can be found at http://www.tceq.texas.gov/field/eapp/wpap.html or by contacting the TCEQ at eapp@tceq.texas.gov.

Ecologically Significant Stream Segment

The proposed project would cross tributaries of Onion Creek. Onion Creek is considered to be an Ecologically Significant Stream Segment (ESSS) from the

confluence with the Colorado River in Travis County to the most upstream crossing of FM 165 in Blanco County. The designation is based on:

- Riparian conservation area – McKinney Falls State Park
- High water quality
- Exceptional aquatic life
- High aesthetic value
- Diverse benthic macroinvertebrate community

TPWD has identified ESSSs throughout the state to assist regional water planning groups in identifying ecologically unique stream segments under Texas Administrative Code (TAC) Title 31 §357.43 and §357.8. Until approved by the legislature this is not a legal designation. The stream segments are identified through extensive review by TPWD staff and are determined to be ecologically important. Information regarding criteria for designation as an ESSS can be found on the TPWD website at http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_issues/sig segs/ or in 31 TAC 357.43 and 357.8.

Recommendation: As previously mentioned, TPWD recommends the project be designed to avoid adverse water quality impacts to Onion Creek and its tributaries.

Federal Laws

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Recommendation: If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends excluding vegetation clearing activities during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends TxDOT survey the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. Any vegetation (trees, shrubs,

and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

Endangered Species Act

Federally-listed animal species and their habitats are protected from "take" on any property by the Endangered Species Act (ESA). Take of a federally-listed species can be allowed if it is "incidental" to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from take except on lands under federal/state jurisdiction or for which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from the USFWS is a violation of the ESA.

The Texas Natural Diversity Database (TXNDD) is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records; for questions regarding a record, please contact txndd@tpwd.texas.gov.

TXNDD records within and adjacent to the study area are shown on the attached map for your reference. Records on that map are labeled using their Element Occurrence Identification (EOID) number. That number corresponds to the EOID field on the attached TXNDD report.

Golden-cheeked Warbler (*Setophaga chrysoparia*) – Federally- and State-listed Endangered

There are two TXNDD occurrences for the Golden-cheeked Warbler (GCWA) within the study area. In addition to the known occurrences, review of a predictive habitat model for the GCWA (Diamond, et al. 2007. *Range-wide Modeling of Golden-cheeked Warbler Habitat.* Section 6 Project E-72-R, Final Report, Texas Parks and Wildlife Department, Austin, Texas) indicates that there is a high potential for suitable habitat for the GCWA within the

study area. A map denoting the areas containing potential habitat is attached for your reference.

Black-capped Vireo (*Vireo atricapilla*) – Federally- and State-listed Endangered

According to the TXNDD there is one occurrence of the federally- and state-listed endangered Black-capped Vireo (BCVI) located within the study area.

Recommendation: TPWD recommends TxDOT perform breeding season surveys for the GCWA and BCVI in areas containing suitable habitat that may be impacted as a result of the proposed project. Even if habitat for these species would not be directly impacted by vegetation removal, if nesting pairs are present in the surrounding vegetation they could be disrupted by noise and activity during construction. Because the definition of take in the ESA includes harming or harassing a listed species, this disturbance could constitute a violation of the ESA. TPWD recommends TXDOT conduct presence/absence surveys according to USFWS GCWA Survey Guidelines (http://www.fws.gov/southwest/es/AustinTexas/ESA_Sci_permits.html). The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for these federally-listed species.

Barton Springs salamander (*Eurycea sosorum*) – Federally- and State-listed Endangered

According to the TXNDD there is one occurrence of the federally and state-listed endangered Barton Springs salamander located within the study area.

Recommendation: TPWD recommends that that study area be surveyed for springs. If springs are present, TPWD recommends TxDOT perform a salamander survey. If protected salamanders are present on-site and would be adversely impacted by the proposed project, then TPWD and the USFWS should be contacted for guidance on protection of this species.

The project study area is predominantly located in Karst Zone 3 which includes areas having a low probability of containing suitable habitat for federally-listed karst invertebrate species.

Recommendations: The USFWS karst invertebrate survey requirements recommend on-the-ground surveys for projects located in Karst Zone 3 to determine if karst features containing endangered invertebrates are likely

to occur. The USFWS Section 10(a)(1)(A) Karst Invertebrate Survey Requirements Survey Protocol may be found at http://www.fws.gov/southwest/es/Documents/R2ES/Karst_Survey_Protocols_20110908.pdf. If not done to date, TPWD recommends that a karst feature survey be performed in accordance with USFWS karst survey protocols to determine if endangered cave invertebrate species may be present and affected by the project.

State Laws

State-listed Species

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for take (incidental or otherwise) of state-listed species. State-listed species may only be handled by persons with a scientific collection permit obtained through TPWD. For more information on this permit, please contact the Wildlife Permits Office at (512) 389-4647.

Based on a review of topographic maps and aerial photography of the project study area, it appears that Onion Creek and its tributaries may provide suitable habitat for freshwater mussels that may be present in Travis and Hays counties (listed below).

Creeper (squawfoot) (*Strophitus undulates*) – Rare species
False spike mussel (*Quadrula mitchelli*) – State-listed Threatened
Golden orb (*Quadrula aurea*) – State-listed Threatened*
Smooth pimpleback (*Quadrula houstonensis*) – State-listed Threatened*
Texas fatmucket (*Lampsilis bracteata*) – State-listed Threatened*
Texas fawnsfoot (*Truncilla macrodon*) – State-listed Threatened*
Texas pimpleback (*Quadrula petrina*) – State-listed Threatened*

*Federal Candidate for Listing

Recommendation: TPWD recommends TxDOT take measures to avoid impacts to aquatic and riparian habitats, which would minimize impacts to aquatic species including rare freshwater mussels. If suitable habitat for freshwater mussels would be directly or indirectly impacted by the proposed project, TPWD recommends TxDOT perform a mussel survey prior to construction. Surveys should include any part of the channel that would be directly disturbed by construction as well as areas that may be blanketed by fine sediments downstream. If native mussels are found in the potentially impacted areas, TPWD recommends TxDOT contact this

office regarding potential relocation of these species to an area that would not be disturbed by construction.

TPWD notes that under Parks and Wildlife Code Section 12.015, 12.019, 66.015 and TAC 57.251-.259, TPWD regulates the introduction and stocking of fish, shellfish, and aquatic plants into public waters of the state. Activities in state waters that involve dewatering or relocation of fish, mussels, or aquatic plants need to be conducted in conjunction with an Aquatic Resources Relocation Plan. Upon completion, such plans are submitted to the appropriate TPWD Inland Fisheries or Coastal Fisheries Kills and Spills Team (KAST) for review. The purpose of these plans is to ensure that native fish, aquatic plants, and mussels are being handled properly and protected from danger during dewatering and/or relocation activities. Accordingly, a permit to introduce shellfish, finfish, and aquatic plants into public waters will be issued once the Aquatic Resources Relocation Plan is finalized and approved by the KAST.

Recommendation: If dewatering activities, relocation of native fish or aquatic plants, or other activities that could result in take of aquatic species would be conducted, TPWD recommends TxDOT submit an Aquatic Resources Relocation Plan to Alan Butler, TPWD Region 1 KAST at alan.butler@tpwd.texas.gov to initiate coordination for a permit to introduce aquatic resources into public waters.

Recommendation: TPWD recommends that impact avoidance measures for all native freshwater mussel species, regardless of state-listing status, be considered during project planning and construction.

Texas horned lizard (*Phrynosoma cornutum*) – State-listed Threatened

The project study area may provide suitable habitat for the Texas horned lizard. If present in the study area, the Texas horned lizard could be impacted by ground disturbing activities from construction. Horned lizards may hibernate on site in the loose soils few inches below ground during the cool months from September/October to March/April. Construction in these areas could harm hibernating lizards. Horned lizards are active above ground when temperatures exceed 75 degrees Fahrenheit. If horned lizards (nesting, gravid females, newborn young, lethargic from cool temperatures or hibernation) cannot move away from noise and approaching construction equipment in time, they could be affected by construction activities.

Recommendation: TPWD recommends that a pre-construction survey be conducted to determine if horned lizards are present in the project study

area. A useful indication that the Texas horned lizard may occupy the site is the presence of Harvester Ant (*Pogonomyrmex barbatus*) nests since Harvester Ants are the primary food source of horned lizards. The survey should be performed during the warm months of the year when the horned lizards are active. Fact sheets, including survey protocols and photos of Texas horned lizard may be found online at http://www.tpwd.state.tx.us/learning/texas_nature_trackers/horned_lizard/ and at http://www.tpwd.state.tx.us/huntwild/wild/species/thlizard/.

If horned lizards are found on-site, TPWD recommends contacting this office to develop plans to relocate them, particularly if there is likelihood that they would be harmed by project activities. To minimize impacts to the Texas horned lizard, TPWD recommends the use of the BMPs described in the *Texas Horned Lizard Watch – Management and Monitoring Packet* which can be found online at http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0038.pdf and *Texas Tortoise Best Management Practices* which can be found online at http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/habitat_assessment/media/texas_tortoise_bmps.pdf. Please note that Texas tortoise BMPs are applicable to the Texas horned lizard.

Rare Species

In addition to state- and federally-protected species, TPWD tracks special features, natural communities, and rare resources that are not listed as threatened or endangered. These species and communities are tracked in the TXNDD, and TPWD actively promotes their conservation. TPWD considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment.

Based on the project description, site location, a review of the TXNDD, and publicly-available aerial photographs, the following rare species and natural community could be impacted as a result of the proposed project:

Texas garter snake (*Thamnophis sirtalis annectens*)

There are two TXNDD occurrences for the Texas garter snake located within the project study area.

Recommendation: Snakes are generally perceived as a threat and killed when encountered during clearing or construction. Therefore, TPWD recommends that personnel involved in clearing and construction be

informed of the potential for the rare Texas garter snake to occur on the project site. Personnel should be advised to avoid impacts to this snake as it is non-venomous and poses no threat to humans. Contractors should avoid contact with this species if encountered and allow the snake to safely leave the premises.

Spot-tailed earless lizard (*Holbrookia lacerata*)

There are three TXNDD occurrences for the Spot-tailed earless lizard located within the project study area.

In January 2010, the species of concern Spot-tailed earless lizard was petitioned for listing under the ESA. On May 24, 2011, the USFWS issued a 90-day finding on that petition. Based on their review, the USFWS found the petition presents substantial scientific or commercial information indicating that listing the Spot-tailed earless lizard may be warranted. The USFWS has therefore initiated a status review to determine if listing is in fact warranted. Based on this status review, the USFWS will issue a 12-month finding on the petition.

Recommendation: TPWD recommends TxDOT monitor the listing status of the Spot-tailed earless lizard throughout project planning and construction and perform required consultation, permitting, and mitigation with the USFWS if this species becomes listed under the ESA.

Plateau live oak/Little bluestem series (*Quercus fusiformis/Schizachyrium* series)

There is one TXNDD occurrence for the Plateau live oak/Little bluestem series (natural community) located within the project study area.

Recommendation: TPWD recommends that construction crews be informed about the possibility of finding and avoiding harm to wildlife and native vegetation, since this would provide the best benefit for wildlife conservation overall.

Recommendation: Please review the TPWD county lists of rare and protected species for Travis and Hays Counties, as rare species in addition to those discussed above could be present depending upon habitat availability. These lists are available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/.

TPWD strives to respond to requests for project review within the 45 day comment period. Responses may be delayed due to workload and lack of staff. Failure to meet the 45 day review timeframe does not constitute a concurrence from TPWD that the proposed project will not adversely impact fish and wildlife resources.

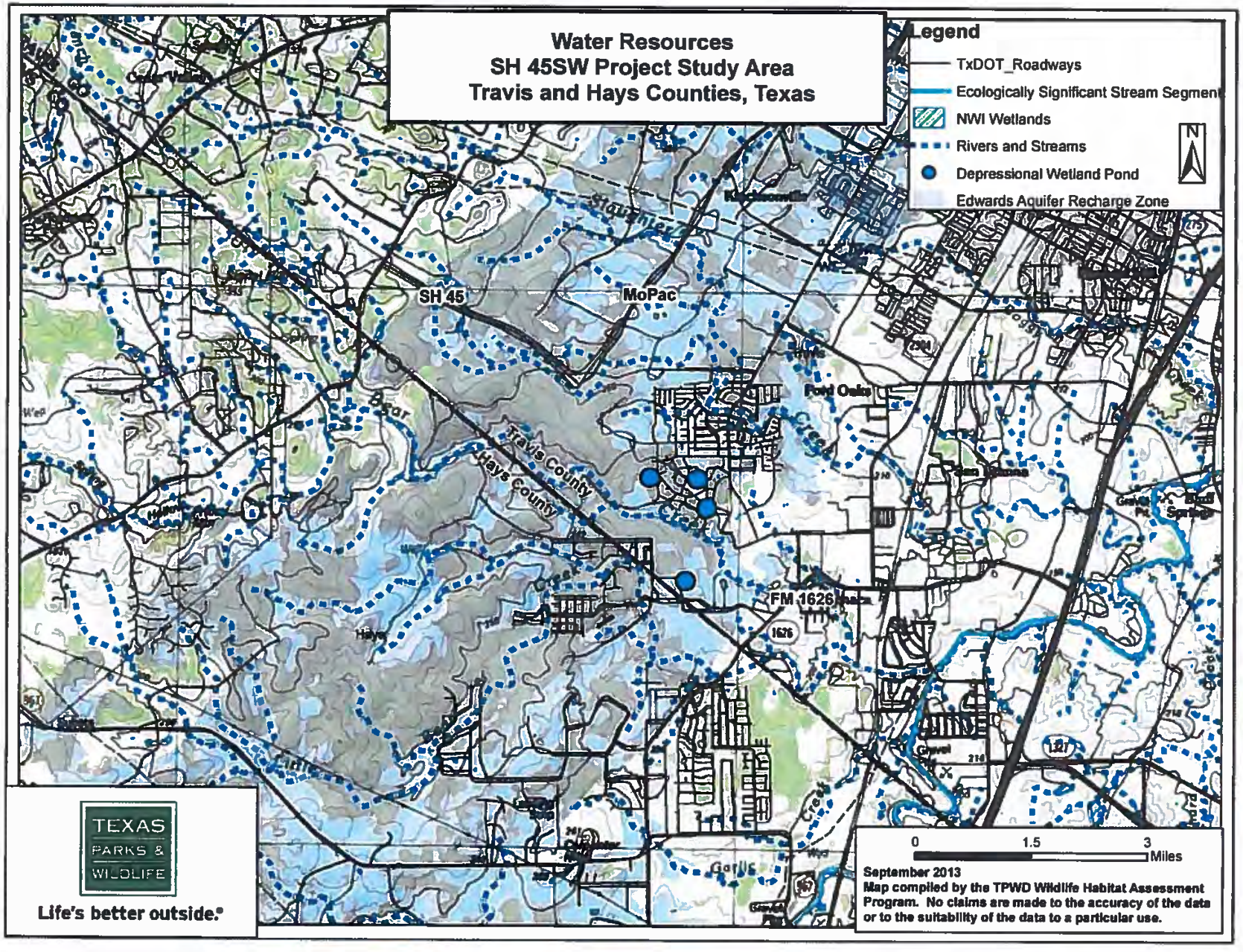
TPWD advises review and implementation of these recommendations. If you have any questions, please contact me at (512) 389-8054 or Jessica.Schmerler@tpwd.texas.gov.

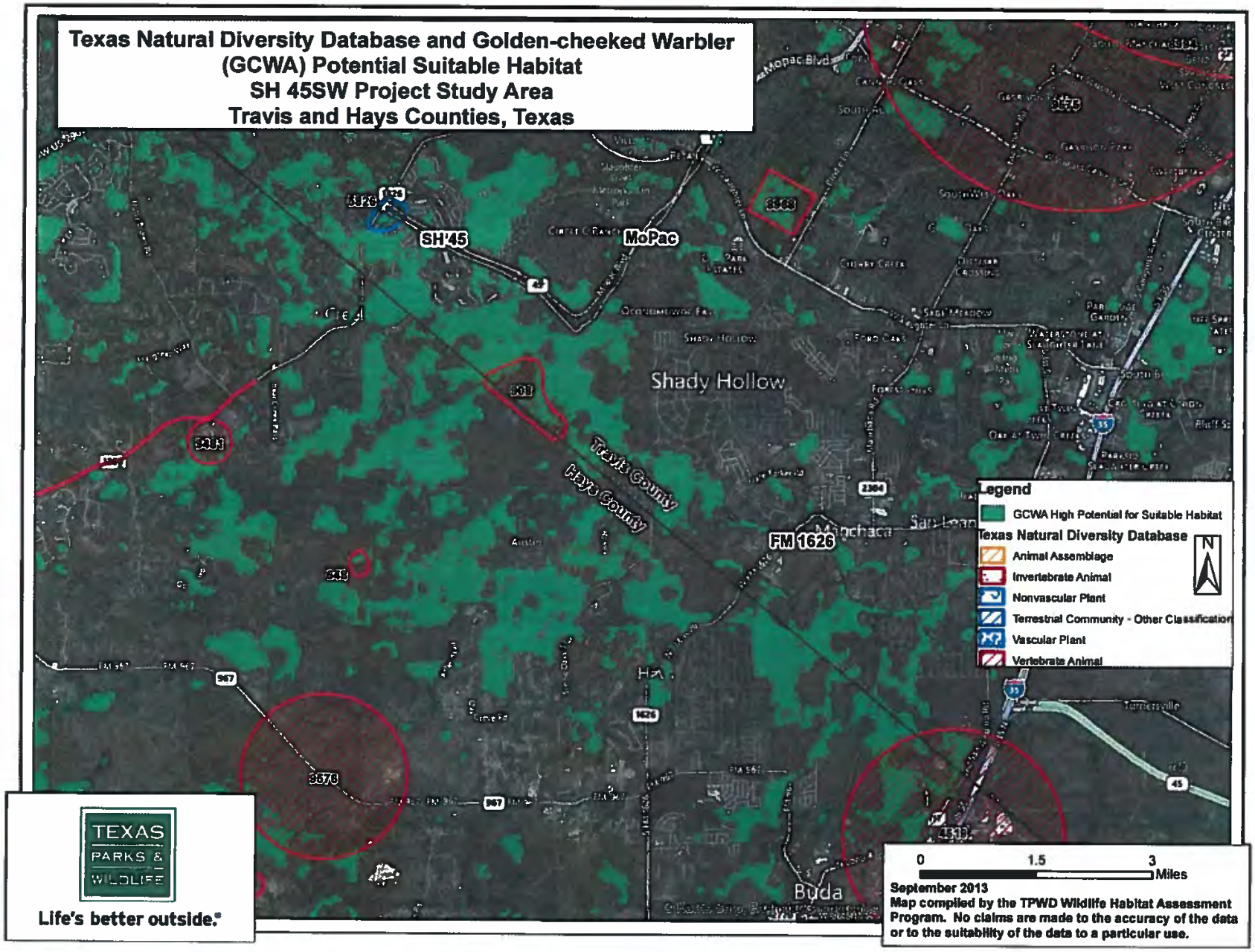
Sincerely,

Jessica E. Schmerler
Wildlife Habitat Assessment Program
Wildlife Division

JES:gg.ERCS-7307

Attachments (3)


Water Resources
SH 45SW Project Study Area
Travis and Hays Counties, Texas
Legend
TxDOT_Roadways
Ecologically Significant Stream Segment
NWI Wetlands
Rivers and Streams
Depressional Wetland Pond
Edwards Aquifer Recharge Zone
N
SH 45
MoPac
Travis County
Hays County
FM 1626
Pond Oaks
Bear
Creek
Garlic
TEXAS
PARKS &
WILDLIFE
Life's better outside.®
0
1.5
3
Miles
September 2013
Map compiled by the TPWD Wildlife Habitat Assessment Program. No claims are made to the accuracy of the data or to the suitability of the data to a particular use.


Texas Natural Diversity Database and Golden-cheeked Warbler (GCWA) Potential Suitable Habitat
SH 45SW Project Study Area
Travis and Hays Counties, Texas
SH 45
MoPac
Shady Hollow
Travis County
Hays County
FM 1626
Buda
Legend
GCWA High Potential for Suitable Habitat
Texas Natural Diversity Database
Animal Assemblage
Invertebrate Animal
Nonvascular Plant
Terrestrial Community - Other Classification
Vascular Plant
Vertebrate Animal
N
0
1.5
3
Miles
September 2013
Map compiled by the TPWD Wildlife Habitat Assessment Program. No claims are made to the accuracy of the data or to the suitability of the data to a particular use.
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TXNDD Tracked Species in Project Area

Element Occurrence ID (EOID)	8968
Scientific Name	Eurycea sosorum
Common Name	Barton Springs Salamander
Global Rarity Rank	G1
State Rarity Rank	S1
Federal Status	LE
State Status	E
First Observation Date	5/2/2006
Survey Date	12/19/2009
Last Observation Date	12/19/2009

EO Data

2 May 2006: 1 adult was collected, 1 juvenile was observed and released. 20 Jun 2008: 5 specimens were collected. 9 Oct 2008: 10 individuals were observed, 5 were collected. 19 Dec 2009: 5 adults were collected.

General Description

Cave stream passage (Barton Springs segment of the Edwards Aquifer): shallow, fast moving stream passage. Portions of the stream passage have cobble, fine silt/clay, and the travertine/bedrock.

Protection Comments

<null>

Management Comments

19 Dec 2009: Cave needs continued monitoring of water quality and quantity in cave and dye trace studies are needed to better protect this cave stream. The contributing zone and recharge zone for this segment of the Edwards Aquifer needs to be protected.

General Comments

Dec 2009: Andy Gluesenkamp, herpetologist for the TPWD Wildlife Diversity Program, is currently working on research that will help clarify what species this population belongs to.

Element Occurrence ID (EOID)	9481
Scientific Name	Holbrookia lacerata
Common Name	Spot-tailed Earless Lizard
Global Rarity Rank	G3G4
State Rarity Rank	S1S2
Federal Status	
State Status	
First Observation Date	1952
Survey Date	5/12/2009
Last Observation Date	7/1/1974

EO Data

1952: A specimen was collected. Jul 1974: 7 specimens were collected. 12 May 2009: Area was surveyed, none were found.

General Description

<null>

Protection Comments

<null>

Management Comments

<null>

General Comments

<null>

Element Occurrence ID (EOID)	9575
Scientific Name	Holbrookia lacerata
Common Name	Spot-tailed Earless Lizard

Global Rarity Rank	State Rarity Rank	Federal Status	State Status
G3G4	S1S2		

First Observation Date	Survey Date	Last Observation Date
1953	1953	1953

EO Data

1953: A specimen was collected on South Congress. No Date: A specimen was collected 4.5 miles SW of Austin.

General Description

<null>

Protection Comments

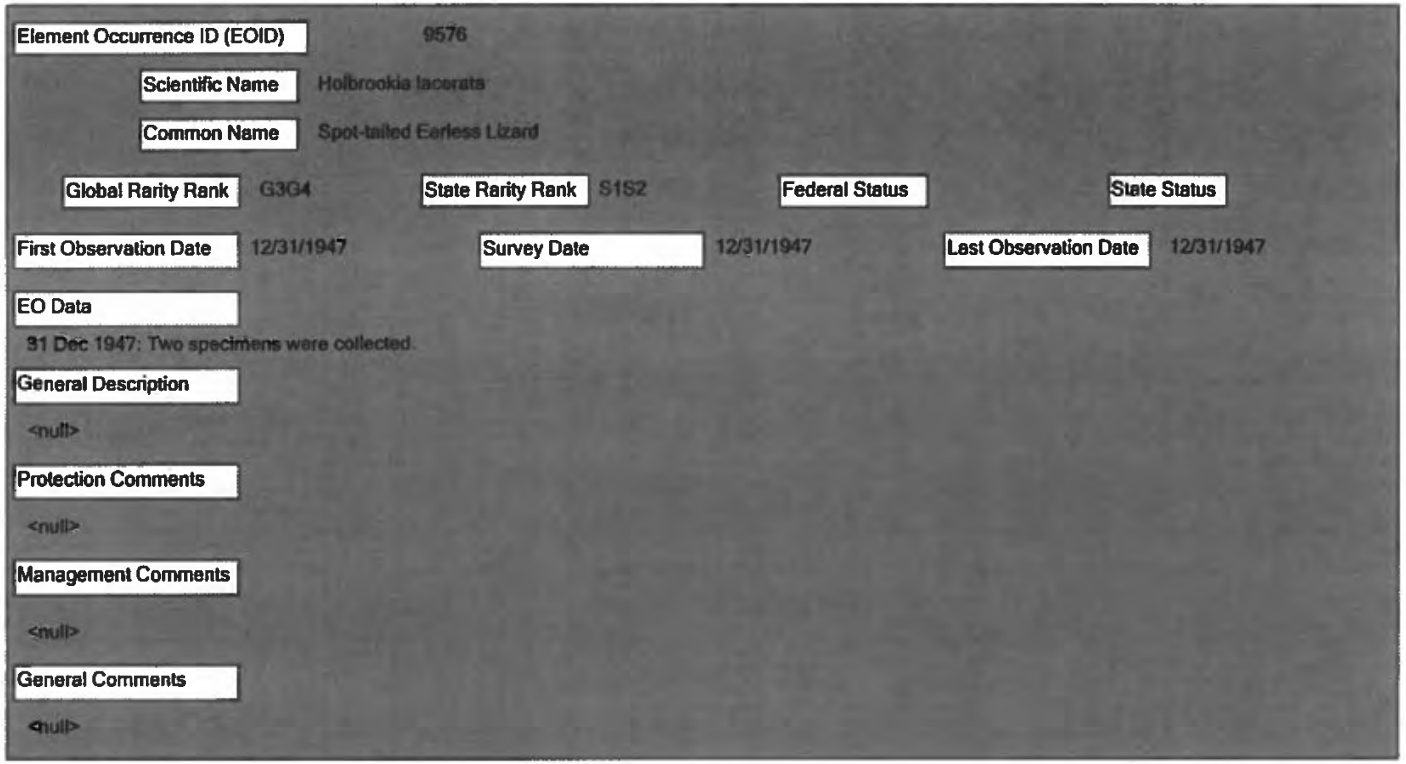
<null>

Management Comments

<null>

General Comments

<null>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9576
Scientific Name
Holbrookia lacerata
Common Name
Spot-tailed Earless Lizard
Global Rarity Rank
G3G4
State Rarity Rank
S1S2
Federal Status
State Status
First Observation Date
12/31/1947
Survey Date
12/31/1947
Last Observation Date
12/31/1947
EO Data
31 Dec 1947: Two specimens were collected.
General Description
<null>
Protection Comments
<null>
Management Comments
<null>
General Comments
<null>

Element Occurrence ID (EOID)	5826
Scientific Name	Quercus fusiformis/schizachyrium scoparium series
Common Name	Plateau Live Oak/little Bluestem Series
Global Rarity Rank	G3
State Rarity Rank	S3
Federal Status	
State Status	
First Observation Date	<null>
Survey Date	7/26/1991
Last Observation Date	7/26/1991

EO Data

<null>

General Description

BIG BLUESTEM, INDIANGRASS, LITTLE BLUESTEM, SIDEOATS COMMON IN GROUND LAYER; APPARENTLY NOT RECENTLY GRAZED BUT COVER BY LIVE OAK HIGH

Protection Comments

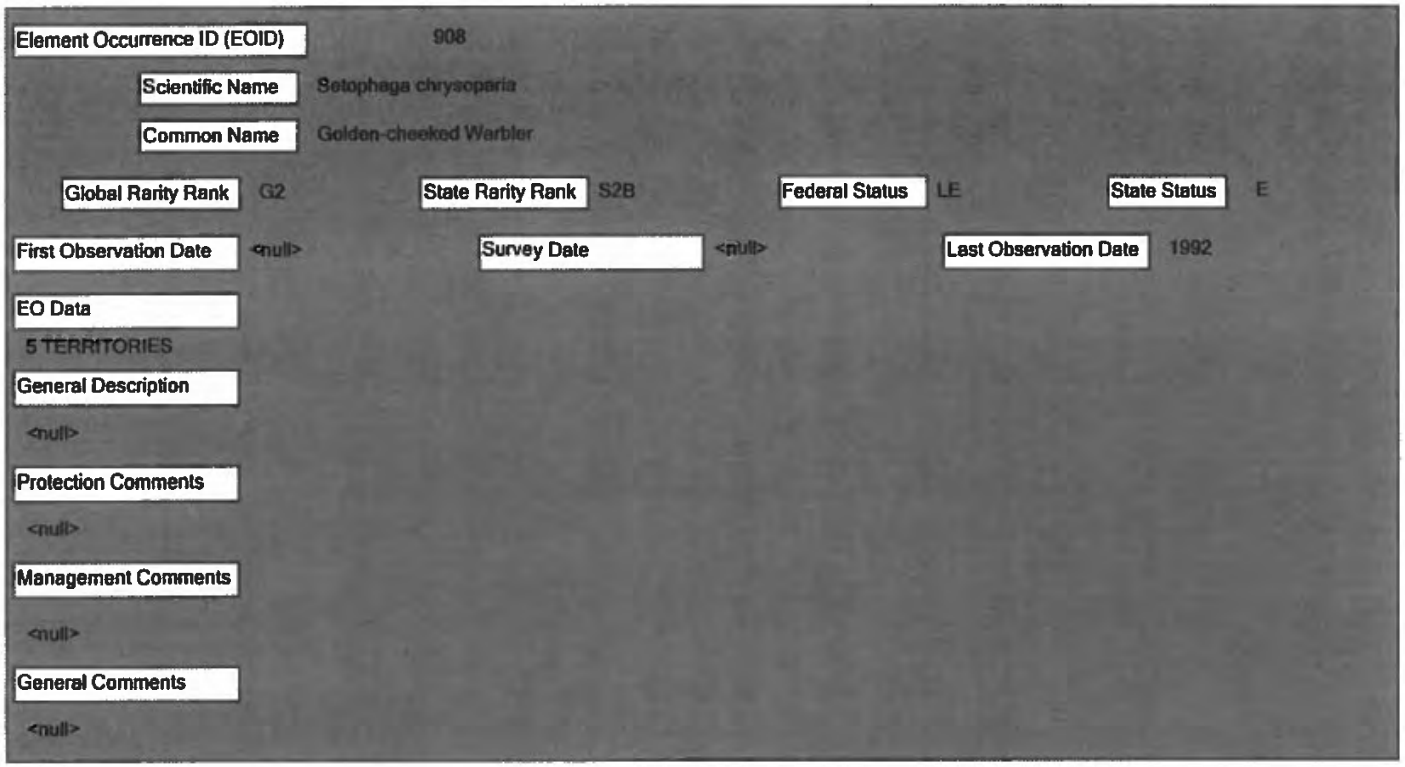
<null>

Management Comments

<null>

General Comments

PRIVATE PROPERTY, NOT SURVEYED EXCEPT AS SEEN FROM HIGHWAY RIGHT-OF-WAY OUTSIDE FENCELINE


Element Occurrence ID (EOID)
908
Scientific Name
Setophaga chrysoparia
Common Name
Golden-cheeked Warbler
Global Rarity Rank
G2
State Rarity Rank
S2B
Federal Status
LE
State Status
E
First Observation Date
<null>
Survey Date
<null>
Last Observation Date
1992
EO Data
5 TERRITORIES
General Description
<null>
Protection Comments
<null>
Management Comments
<null>
General Comments
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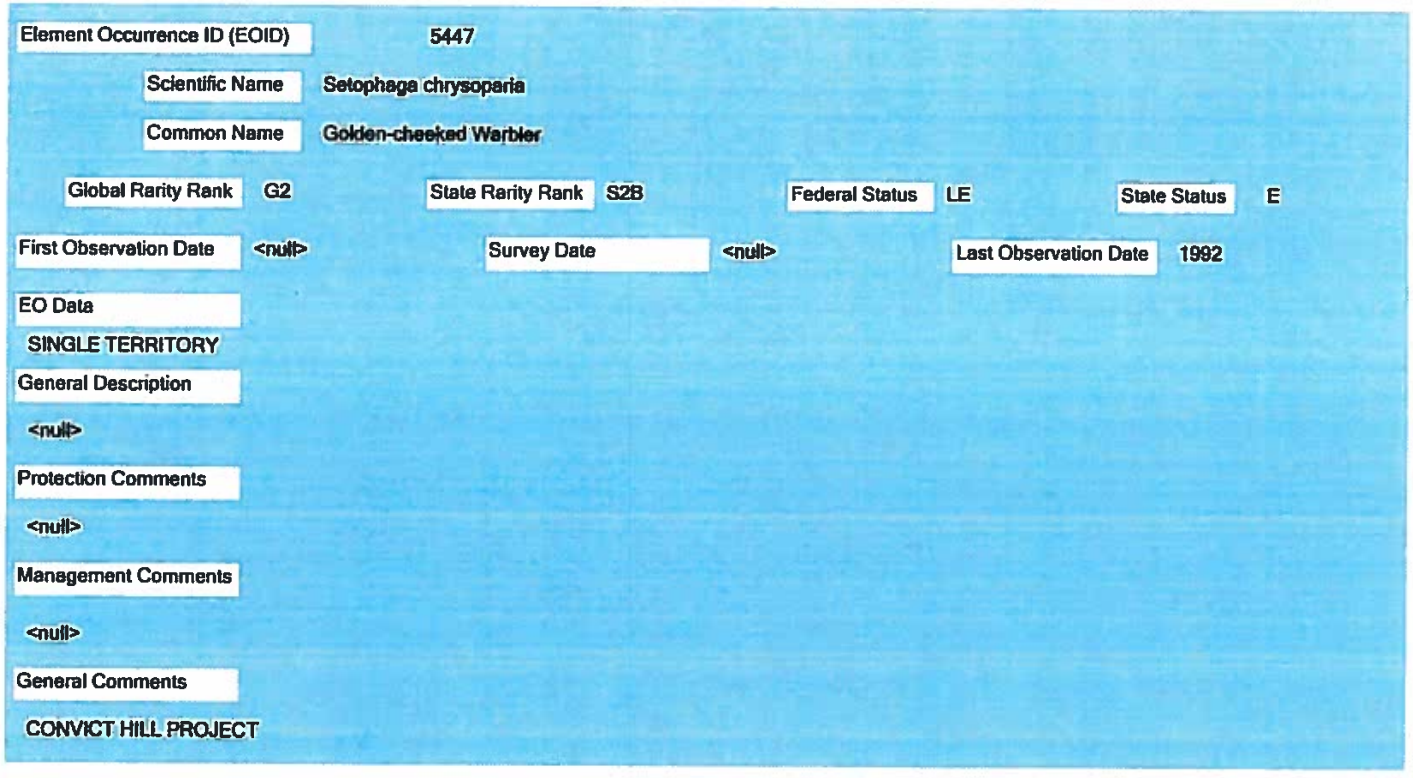
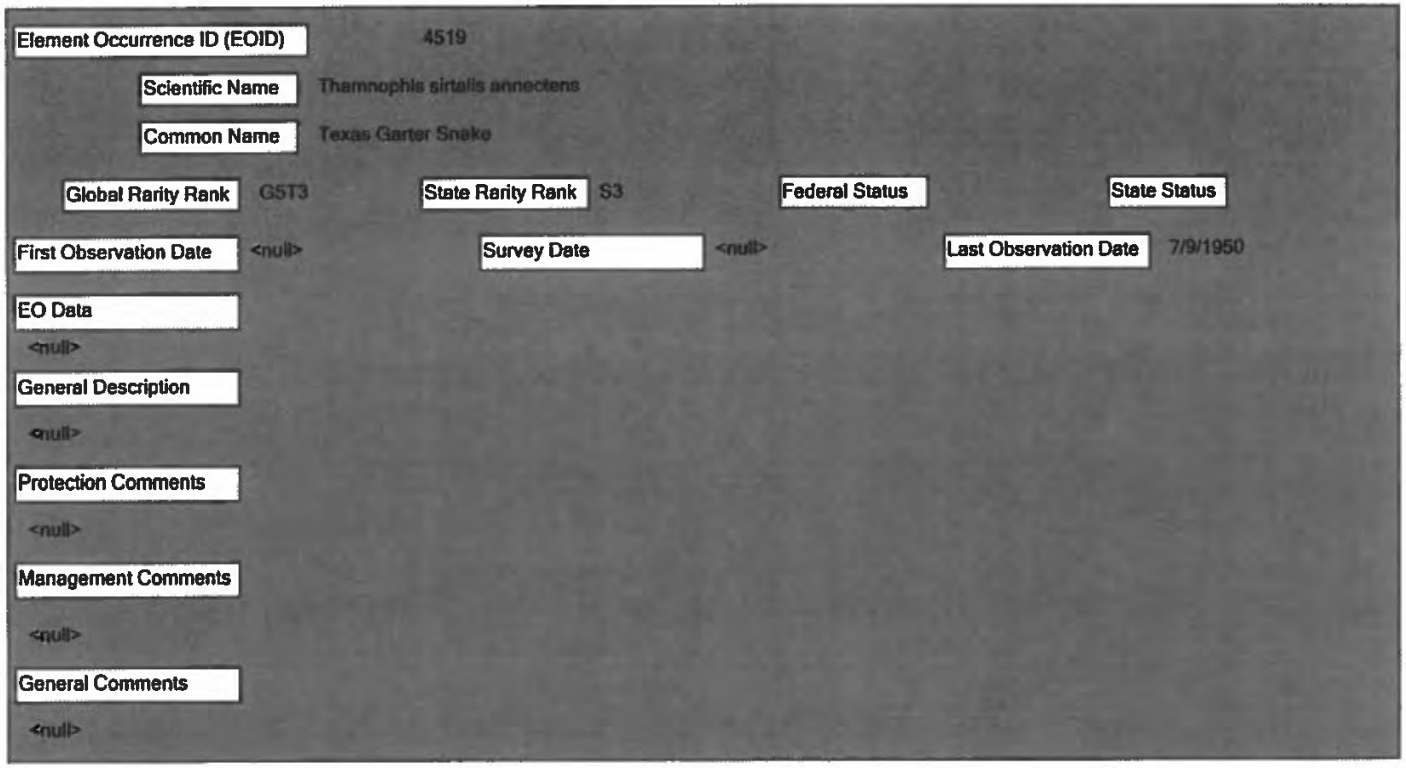

Element Occurrence ID (EOID) 5447
Scientific Name Setophaga chrysoparia
Common Name Golden-cheeked Warbler
Global Rarity Rank G2
State Rarity Rank S2B
Federal Status LE
State Status E
First Observation Date <null>
Survey Date <null>
Last Observation Date 1992
EO Data
SINGLE TERRITORY
General Description
<null>
Protection Comments
<null>
Management Comments
<null>
General Comments
CONVICT HILL PROJECT


Element Occurrence ID (EOID)
4519
Scientific Name
Thamnophis sirtalis annectens
Common Name
Texas Garter Snake
Global Rarity Rank
G5T3
State Rarity Rank
S3
Federal Status
State Status
First Observation Date
<null>
Survey Date
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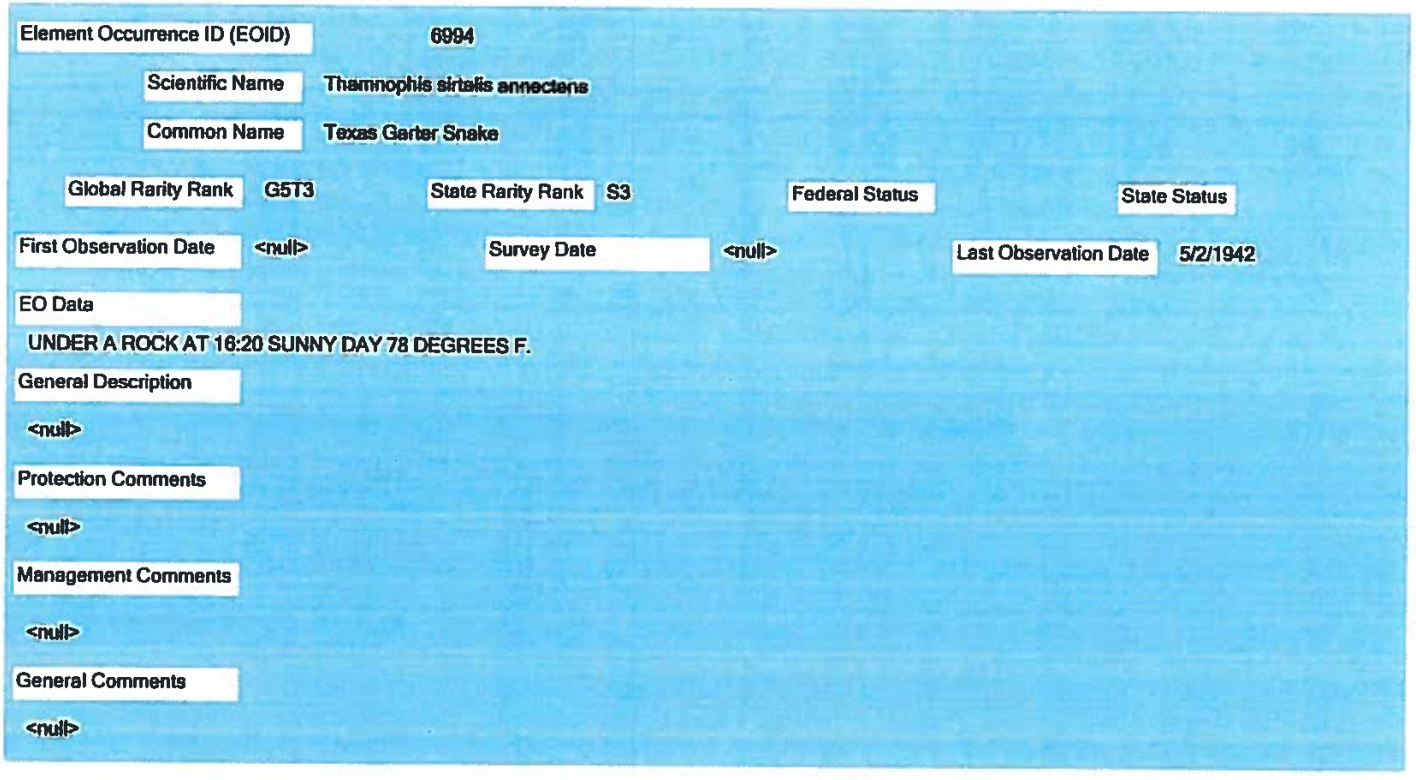
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State Rarity Rank S3
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State Status
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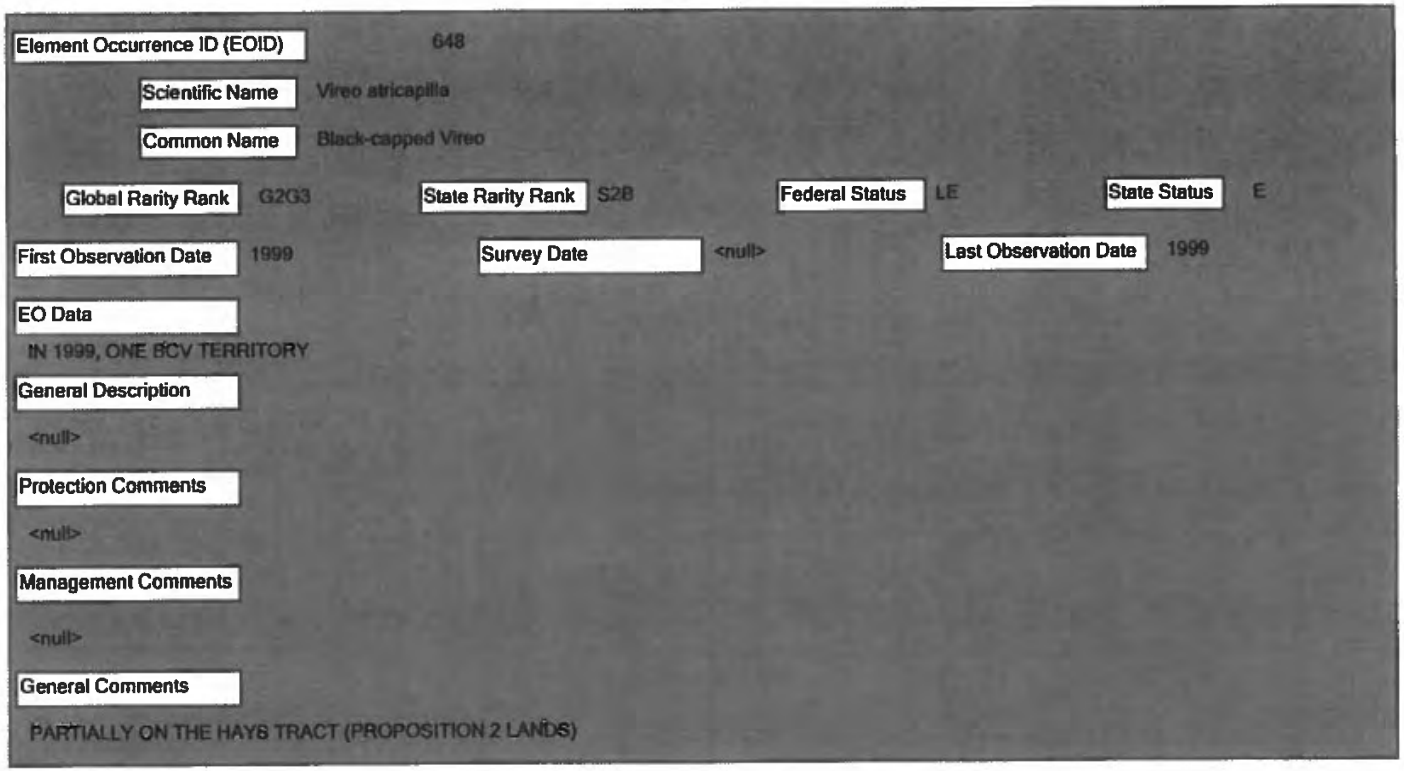
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EO Data
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General Description
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Protection Comments
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Management Comments
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General Comments
PARTIALLY ON THE HAYS TRACT (PROPOSITION 2 LANDS)

FINAL REPORT

As Required by

THE ENDANGERED SPECIES PROGRAM

TEXAS

Grant No. TX E-122-R-1

Endangered and Threatened Species Conservation

Status of Newly Discovered Cave and Spring Salamanders (*Eurycea*) in Southern Travis and Northern Hays Counties

Prepared by:

Dr. Paul Chippendale

Carter Smith
Executive Director

Clayton Wolf
Division Director, Wildlife

15 October 2012

FINAL REPORT

STATE: Texas **GRANT NUMBER:** E – 122-R-1

GRANT TITLE: Status of Newly Discovered Cave and Spring Salamanders (*Eurycea*) in Southern Travis and Northern Hays Counties

REPORTING PERIOD: 17 Sep 09 to 16 Sep 12

OBJECTIVE(S):

To examine the status of newly discovered salamander populations in the Barton Springs Segment of the Edwards Aquifer using mitochondrial and nuclear DNA sequences, microsatellite markers, and allozymes and assess their relationships to the federally protected species *Eurycea sosorum* and *E. nana* over two years.

Segment Objectives:

Task 1. Sept.-Dec. 2009: fieldwork will be conducted at approximately 5-6 spring sites and 1 cave site, in addition to searches for additional localities. Initiate lab work using molecular markers already developed, and explore possible additional markers.

Task 2. Jan. 2010 - Dec. 2010. Continue fieldwork, having established sampling sites and additional landowner permission. Reconstruct a phylogenetic tree and a mt haplotype network to ascertain whether the "intermediate" populations are monophyletic, and how the pattern of (primarily) mt gene flow reflects the evolutionary history of *E. sosorum*, *E. nana*, and salamanders from the newly discovered populations (and relationships with other Texas *Eurycea*). We also will assess allozyme variation.

Task 3. Fieldwork will continue. Using microsatellite loci previously developed, samples will be screened to evaluate the potential for identifying individuals by population and tracking gene flow. We will use at least 10-12 microsatellite markers per individual in all specimens collected to compare to approximately 50 *E. nana* and 100 *E. sosorum*, plus numerous representatives of other *Eurycea* in the region. Test for the presence of distinct populations and potentially identify hybrid zones.

Task 4. Jan. 2011-Aug. 2011. Complete fieldwork, molecular studies, data analyses, and prepare publication(s) for peer-reviewed publication.

Significant Deviation: None.

Summary Of Progress: Please see Attachment A.

Location: Travis and Hays County, TX

Cost: Costs were not available at time of this report.

Prepared by: Craig Farquhar **Date:** 15 October 2012

Approved by: _____ **Date:** 15 October 2012
C. Craig Farquhar

ATTACHMENT A

Final Report:

Status of newly discovered cave and spring salamanders (*Eurycea*) in southern Travis and northern Hays Counties

Section 6 TX E-122-R

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October 2012

Introduction and background

The Barton Springs salamander (*Eurycea sosorum*) was described by Chippindale et al. (1993) from Barton Springs in Zilker Park, Travis County, Texas. This completely aquatic species is thought to have one of the smallest geographic ranges of any amphibian in North America, and is highly susceptible to degradation of water quality in the Barton Springs segment of the Edwards Aquifer (e.g., Chippindale and Price 2005). *Eurycea sosorum* belongs to the clade *Notiomolge* (Hillis et al. 2001), separated from the *Septentriomolge* ("northern") clade by the Colorado River, an ancient feature of the Edwards Plateau that separates the Aquifer waters roughly north-south into distinct geological and biological units. A recently discovered member of the highly divergent, cave-dwelling *Typhlomolge* clade (*E. waterlooensis*) was described by Hillis et al. (2001) from subterranean waters beneath Barton Springs and appears to be partially sympatric with *E. sosorum*. The other recognized species of *Eurycea* that are geographically closest to the known range of *E. sosorum* occur along and near the southeastern margin of the Plateau (Balcones Escarpment). These are *E. nana* at San Marcos Springs, Hays Co., *E. rathbuni* in the subterranean waters of the San Marcos Pool of the Aquifer beneath the habitat of *E. nana*, *E. pterophila* in the Blanco River drainage, and the little-known species *E. robusta* in the Aquifer underlying this drainage.

Despite the presence of apparently suitable spring and cave habitat in the roughly 50 km zone between the ranges of *E. sosorum* and the other species, salamanders seemingly were absent from this area (e.g., Sweet 1982, Chippindale et al. 2000). In the early 2000s, cavers discovered *Eurycea* in Blowing Sink Cave in south Austin (see Fig. 1 for this and other localities), potentially extending the known range of *E. sosorum*. However, Hillis and colleagues (pers. comm.) found that the mitochondrial haplotype of the (then) single known salamander from this site (and that of subsequently discovered animals at Taylor Springs, Hays County, geographically intermediate between Austin and San Marcos) was most similar to that of *E. nana* from San Marcos Springs. Nathan F. Bendik (2006; unpubl. master's thesis, University of Texas at Arlington) and Chippindale conducted much more extensive genetic sampling of *E. sosorum*, *E. nana*, and the few known specimens from the newly-discovered localities and found that this haplotype (or ones that are nearly identical) also occurs at roughly 30% frequency in *E. sosorum* from Barton Springs. More recently, Bendik (now with City of Austin Watershed Protection Department), Andrew G. Gluesenkamp (TPWD) and I found these *E. nana*-like haplotypes in salamanders from Cold Springs in Austin, the third identified "new" locality (this site is roughly northwest of Barton Springs). Additional sampling from Cold Spring, Taylor Springs and Blowing Sink Cave (detailed in this report) confirms the occurrence of this haplotype group alone at these geographically proximal or intermediate localities. Very recently (August 2012), Bendik and Gluesenkamp (after years of attempts) obtained access to a spring on the Spillar Ranch, roughly halfway between the Blowing Sink and Taylor Springs sites, and obtained specimens, filling a major geographic sampling gap. Here I show that these too possess "*nana*-like" haplotypes, and that haplotypes unique to *E. sosorum* have only been observed at Barton Springs.

Occurrence of the "*nana*-like" haplotypes could represent retention of ancestral mitochondrial sequence polymorphism. However, the two species probably diverged from a common ancestor over 2 million years ago (Bonett, Wiens and Chippindale, in prep; see also Wiens et al. 2006 for divergence times in other Texas *Eurycea*). Thus, the minimal differentiation between the "*nana*" and "*nana*-like" haplotypes may indicate that there has been some degree of gene flow since speciation (likely limited and/or sporadic). This hypothesis is supported to some extent by the mitochondrial and nuclear data presented here, but it appears very unlikely that regular gene exchange between the two species is occurring. Moreover, the molecular data and analyses indicate that any past gene flow likely was unidirectional (south to north; i.e., San Marcos Pool to Barton Springs segment), consistent with flow paths in the Aquifer regions (see references in next paragraph).

Although *E. sosorum* and *E. nana* from the type localities (Barton and San Marcos Springs, respectively) are distinguishable based on morphology from one another and from other central Texas *Eurycea* (e.g., Chippindale 1998, 2000; Chippindale et al. 2000, although see Results and Discussion regarding the existence of occasional individuals at Barton Springs that show characteristics of both *E. sosorum* and *E. waterlooensis*), salamanders from the geographically intermediate populations and Cold Springs are morphologically quite variable and, based on cursory examination, show external features associated with both species (I have not conducted detailed morphological/morphometric studies, although plan to so as part of a collaborative project with Bendik, Gluesenkamp, and J. Meik and C. Roelke from UTA). This further supports the possibility that *E. nana* and *E. sosorum* have hybridized to some extent although again, the molecular data and analyses argue against ongoing gene flow. While the Barton Springs and San Marcos portions of the Aquifer often are considered hydrologically separate, there is geologic evidence of periodic water flow between the two regions (e.g., Slade et al. 1986; see also the dye trace flow paths of Hauwert et al. [2004] in Fig. 1, and a very recent, much more extensive assessment provided by Johnson et al. 2012). Moreover, dye traces show that water from the Blanco River can emerge at either spring (Johnson et al. 2012).

An initial hypothesis in this study was that salamanders from at least some of these sites could represent a third, closely related species, and Taylor Springs (the site most distant from Barton Springs) in particular appears to be highly isolated from gene flow with the other populations and species addressed here, although as shown below its allelic composition with respect to the nuclear sequences and microsatellite loci is most consistent with that of *E. sosorum*; it simply lacks most of the variation seen in the Barton Springs, Cold Spring, Blowing Sink Cave, and Spillar Ranch Spring populations. Further assessment of the status of this population is provided in the Results and Discussion below. Conversely, analyses of microsatellites and nuclear sequences suggest relatively high levels of gene flow between salamanders from Barton Springs, Cold Spring and Blowing Sink (the sites closest to Barton Springs) and Spillar Ranch Spring (next closest) and these almost certainly represent *E. sosorum*. Although the distribution of salamanders in northern Hays and southern Travis Counties is little known, the sampling in this study provides a transect with few, but well-spaced, localities, and the

inferences as to their status and levels of gene flow largely follow the distributional pattern.

Although not initially intended as a major focus of this study, the discovery of mitochondrial haplotypes otherwise associated with *E. waterlooensis* in two individuals from Barton Springs identified based on morphology as *E. sosorum*, and a mitochondrial haplotype associated with *E. sosorum* in an individual identified as *E. waterlooensis*, led me to add this species to the study. One of the key questions initially was whether *E. sosorum* and *E. nana* hybridize, and inclusion of *E. waterlooensis* was necessary to further test the distinctiveness of *E. sosorum*. As I explain in more detail below, mitochondrial, nuclear sequence, and microsatellite data indicate that gene exchange between *E. sosorum* and *E. waterlooensis* is very limited and the two maintain distinct identities while effectively sympatric. Limited comparisons with *E. rathbuni* reveal an intriguing situation: like *E. sosorum*, *E. waterlooensis* contains two distinct mitochondrial haplotype clades, one very similar to a haplotype clade seen in *E. rathbuni* from San Marcos, suggesting a parallel between events that may have shaped mitochondrial variation in *E. sosorum* and those that have done so in *E. waterlooensis*.

Chippindale et al. (2000) found that *E. nana* from San Marcos Springs (the type locality and only confirmed habitat for this species) were extremely distinct from all other Texas *Eurycea* based on multiple allozyme loci. *Eurycea sosorum* from Barton Springs displayed none of *E. nana*'s diagnostic (nuclear) allozyme alleles, but did exhibit the highest levels of allozyme-based genetic variation seen in the Texas *Eurycea*. This suggests large population size and/or input of genes from areas outside of the main springs . However, at the time, additional populations were not known, nor was the existence of *E. waterlooensis* (in the subterranean waters beneath Barton Springs), so gene flow seemed unlikely. Given recent discoveries, this now seems much more plausible, not only from populations between San Marcos and Austin, but likely between *E. sosorum* and *E. waterlooensis* (to a limited but detectable extent; see below). The apparent lack in *E. sosorum* from Barton Springs of the unique allozyme alleles seen in *E. nana* from San Marcos Springs suggests that direct gene flow from San Marcos to Austin is unlikely.

Collaborators:

This work has been conducted in close conjunction with Nathan Bendik (City of Austin Watershed Protection Department) and Andy Gluesenkamp (Texas Parks and Wildlife Department), and when I say "I" in this report it is important to recognize that although I conducted the molecular work and am responsible for the conclusions, they have devoted a tremendous amount of field time, as well as providing highly valuable insights. They have greatly increased the sampling of the three recently discovered populations, Cold Spring, Blowing Sink, and Taylor Springs (plus Spillar Ranch Spring, which was thought to be inhabited by salamanders but only became accessible in August 2012, after a hiatus of over 20 years). In the course of this work, they identified multiple additional sites that have high potential for occurrence of *Eurycea*. Gluesenkamp and Bendik have spent an estimated 120 person-hours in the field, including repeated sampling of six test wells that

intersect the subterranean waters through which these salamanders move, plus four springs with potential for salamander occupation in Travis County. Although salamanders have not yet been found in the wells, the work did yield important information on subterranean invertebrates, and access to Spillar Ranch Spring filled a major geographic gap in sampling.

Methods

Sampling:

Salamanders, or tissue samples (tail tips) from animals that subsequently were released or maintained in the City of Austin breeding facility, were collected from the known ranges of the species involved (*E. sosorum*, *E. nana*, and *E. waterlooensis*), plus the "new" localities described below (Fig. 1). Most samples from the "new" populations were obtained in 2009-2012 (primarily by Gluesenkamp and Bendik), but some from the earlier-known localities represent material that colleagues and I collected in the early to mid-1990s. DNA samples for numerous specimens of *E. nana*, collected by Lauren Lucas (former graduate student, Texas State University), were provided by Dr. Christopher Nice (Texas State University). In additional, many samples of *E. sosorum* and *E. waterlooensis* were provided by Dee Ann Chamberlain and Dr. Laurie Dries (City of Austin Watershed Protection Department), many in the course of a study that I conducted with them several years ago on genetics of *E. sosorum* at Barton Springs. All recently collected specimens were or will be deposited in the University of Texas at Arlington Amphibian and Reptile Diversity Research Center collection, and earlier specimens are held in the Texas Natural History Collection at the University of Texas at Austin. Georeferences for all localities are available from the City of Austin Watershed Protection Department and the Texas Parks and Wildlife Department.

This study involves a much larger sample than was previously available (five individuals from Cold Spring (Austin, geographically closest to Barton Springs), 16 from Blowing Sink (south Austin), eight from Spillar Ranch Spring, (extreme south Austin, previously unsampled), and 10 from Taylor Springs (Little Bear Creek; Onion Creek drainage), in addition to dozens of individuals of *E. sosorum* and *E. nana* from their type localities at Barton Springs and San Marcos Springs, respectively (for microsatellites, 69 from Barton Springs and 43 from San Marcos Springs). The original questions in this study focused on possible interactions between *E. sosorum* and *E. nana* (whether mitochondrial genes from *E. nana* were introgressing into *E. sosorum*, and if the two may even be conspecific). However, it became evident (or at least, it appears very likely) that *E. waterlooensis* hybridizes with *E. sosorum*, so I included representatives of this species in the study (up to 16 depending on the genetic locus examined). I have considerable data for *E. rathbuni* at San Marcos Springs (this subterranean species is thought to be sister or very closely related to *E. waterlooensis*) and have used this to a limited extent for reference, but there is no evidence that it hybridizes with *E. nana*, with which it is effectively sympatric. Thus, it was not included directly in the study except for comparison to *E. waterlooensis*, primarily with respect to mitochondrial DNA data.

DNA sequence markers:

DNA from most specimens was extracted using Qiagen DNeasy kits; samples from the 1990s were obtained using standard phenol-chloroform methods. Loci (here I use this term to mean any specific segment of DNA, mitochondrial [mt] or nuclear [nuc], coding or non-coding) were amplified via polymerase chain reaction (PCR) using a wide range of cycling conditions and in most cases, taxon-specific primers developed or modified by me and students in my laboratory. I sequenced portions of a broad range of mt and nuc loci. Mt: cytochrome b (approximately 1.1 kilobase [kb], trimmed to 979 base pairs [bp]) was the primary marker used, but cytochrome oxidase I (COX1; approx. 700 base pairs, bp), NADH dehydrogenase subunit 2 (ND2) and adjacent tRNA genes (approx. 900 bp), and other mt regions were used in some cases, partly to verify the occurrence of apparent hybrids between *E. sosorum* and *E. waterlooensis*. Nuc: Portions of recombination-activating gene I (RAG-1; approx. 2 kb; I subsequently focused on a variable region of about 800 bp), melanocortin receptor gene 1 (Mc1r; approx. 500 bp), pro-opiomelanocortin gene (POMC; approx. 450 bp), triosephosphate isomerase gene from end of exon 2 through exon 5 (including three introns; approx. 800 bp), and a segment of the ornithine decarboxylase (ODC) gene encompassing mid-exon 6 to mid-exon 8, including introns 6 and 7 (approx. 650 bp). I eventually abandoned ODC because although it shows useful variation, this primarily is in the form of multiple insertion-deletion events in the introns. This becomes complex, but essentially, the sequence is "shifted" in heterozygotes and interpretation becomes extremely difficult without time-consuming and expensive cloning approaches (which proved intractable). TPI showed little useful variation and amplification was often difficult. RAG-1, POMC, and Mc1r were much more readily amplifiable and interpretable, and I focused on these for the nuc sequence component of the study.

Of the mt loci, cytochrome b (cyt b) was most variable overall, and cytochrome oxidase I and NADH 2 also were highly informative (but used to a very limited extent, and data are not shown here). Since these genes are mitochondrial they are tightly linked genetically; however, each provides a "check" on the other with respect to consistency of results. Where applied, these additional mt regions provided results consistent with those based on cytochrome b.

Of the nuc regions sequenced, all showed little variation (each is known to be evolutionarily conserved, so this was to be expected; less is known for the the introns of ODC, and this locus largely has been used phylogenetically for studies of relationships in birds [e.g., Johansson et al. 2008]). However, the sites that are variable (in RAG-1, POMC, and Mc1r) have proven to be informative (Table 1), especially with respect to the possibility of hybridization. Many workers avoid such slowly evolving genes for study of populations and closely related species. However, the changes that do occur are likely only to have occurred once (i.e., the sites are unlikely to change back and forth between, say an A and a G). Thus, they can serve as highly reliable markers of organismal history on even a fine scale even when the vast majority of sites in the gene are invariant.

RAG 1 exhibited five potentially informative variable sites across *E. nana*, *E. sosorum*, the populations in question, and *E. waterlooensis*. It is very important to note that each site within the genes cannot be treated as an independent locus since they are so closely genetically linked; an allele of the gene is defined by the particular combination of variation at the sites. Standard sequencing methods often cannot separate individual alleles, and an allelic library that I developed using cloning approaches proved problematic, although this approach is worth revisiting, especially for fine-scale studies of parentage and relationships among individuals. As I describe below, sequencing can define alleles that are mutually exclusive, and here this is the case for RAG-1 and Mc1r. For Mc1r, two sites were variable in the taxa of interest, and three (consisting of a covarying nucleotide "doublet (i.e., two adjacent sites that consistently varied together) together with a third elsewhere in the sequence region examined, were informative for POMC.

Microsatellites:

The microsatellite portion of this study initially was hampered by technical problems. I have conducted extensive microsatellite studies of the Texas *Eurycea* and this was very unexpected. Recently I was able to get these markers working reliably and have made a major push to complete this data set and verify results. This has been highly successful, but there are some missing data to fill in and data points to be checked. At this stage, the small amount of remaining work to be done seems highly unlikely to affect the overall results, and I can add this information to the final version of the report during the review period. The problems largely revolve around *E. nana*, somewhat surprising given the high quality of the DNA and its fairly close relationship to *E. sosorum* and the populations of uncertain status.

PCR primers for microsatellite loci were developed using a modification of the methods of Glenn and Schable (2006), and PCR products were electrophoresed on an ABI 3130xl automated sequencer, generally multiplexed with combinations of HEX, FAM, and NED dyes and sized using ABI's 400 or 500 bp ROX size standards. Loci used are listed in Table 5 together with raw allelic data. Data for most individuals of *E. sosorum* (Barton Springs) were collected in an overlapping study with Austin Community Foundation (Chippindale 2011), and many were retested here and used for calibration of mobilities. Of roughly 60+ loci tested (most prior to this study) I initially narrowed this to eight. Three of these proved erratic or difficult to interpret (although I have used them previously in other species of Texas *Eurycea*, including *E. sosorum*); the main problematic taxon was *E. nana*, for which amplification of three loci was sporadic, despite the availability of dozens of high quality DNA samples. This limits the results to use of relatively few, somewhat conserved loci (although they did exhibit up to 24 alleles/locus, not unusual for a microsatellite study), and as a result the levels of divergence may be underestimated in comparison to those of studies that use more variable markers. However, particularly with use of R_{st}-based estimates of divergence as well as F_{st}s (the former take into account not only frequencies of individual alleles, but differences in allele size, a function of repeat number; see below) insights into levels and

patterns of differentiation are enhanced. The loci used do not introduce a systematic bias in terms of relationships or gene exchange; they simply represent a conservative estimate of the level of genetic isolation; and the difficulties with *E. nana* are suggestive of its distinctiveness, consistent with previous use of nuclear allozyme loci (Chippindale et al. 2000).

The loci used all vary primarily based on differences in numbers of tetranucleotide repeats. To ensure that I was examining genuine microsatellites (especially because some PCR primer pairs generate multiple peaks of widely varying sizes), I gel-extracted and sequenced bands from agarose gels to verify the identity of these markers.

Overall, I employed a wide range of markers that reflect genetic variation across both nuclear and mitochondrial genomes, and directly answer questions about potential hybridization between *E. nana* and *E. sosorum*, as well as possible gene flow between *E. sosorum* and *E. waterlooensis*.

Analyses:

Results of phylogenetic analyses shown here are based on the mt cytochrome b gene. In the tree presented (Figure 2) I did not include all specimens of *E. sosorum* (Barton Springs) and *E. nana* (San Marcos) because the additional specimens examined exhibited sequences that identical or nearly identical to those in their haplotype groups. This is a matter of simplicity (the tree becomes difficult to read if all samples are included), and these can easily be added if this is desirable. I present a neighbor-joining tree based on HKY85-corrected sequence distances (Hasegawa et al. 1985); Bayesian analysis was also employed and yielded nearly identical results. Standard methods of phylogenetic analysis are problematic for the conserved nuclear genes because there are very few variable sites, and many individuals are heterozygous for some of these sites. However, the information they contain provides a great deal of insight into gene flow and here is presented in tabular form.

Allelic designations for microsatellites, defined by relative fragment size, were determined using GeneMarker (Softgenetics), and population genetic analyses primarily were conducted using GenAlex 6 (Peakall and Smouse 2006). Loci were treated as codominant markers, and results of analyses (with respect to population differentiation and potential gene flow) focus mainly on Wright's F statistics (e.g., Wright 1969; see also Weir and Cockerham 1984), plus the R- statistics of Slatkin (1995; see also Slatkin 1981, 1985). F-statistics simply consider each allele for a given locus as distinct, regardless of repeat number or fragment size, whereas R values take into account the difference in fragment size based on a stepwise model of microsatellite evolution, whereby increasing difference in size reflects increasing time since divergence. I used AMOVA (Analysis of Molecular Variance; Excoffier et. al. 1992) to determine the extent to which variation in microsatellites is partitioned among populations (and species) relative to total variation. I included the highly distinct subterranean species *E.*

waterlooensis, which is effectively sympatric with *E. sosorum* at Barton Springs (Hillis et al. 2001; Chippindale et. al. 2000, Chippindale 2000) because as described further below, it seems very likely that the two experience some degree of hybridization.

Results and Discussion

Mitochondrial variation:

With the exception of *E. sosorum* and *E. waterlooensis* at Barton Springs, salamanders at each locality exhibited little or no mt variation based on cytochrome b sequences (Fig. 2). Within *E. nana* from the type locality, San Marcos Springs (13 specimens included in the tree), uncorrected sequence divergence ranged from 0.0 - 0.2% and these form a weakly supported monophyletic group. They fall within the larger clade of *E. nana*-like sequences seen at Cold Spring, Blowing Sink, Spillar Ranch Spring, Taylor Springs, and a subset of individuals from Barton Springs. All mt divergences in this haplotype group are low (maximum about 0.3%). Those from Spillar Ranch Spring (more distant from Barton Springs; five with complete sequence) exhibited no mt variation, nor did those from Taylor Springs (geographically closest to San Marcos Springs; 10 individuals).

The situation at Barton Springs is complex. There are two distinct mt haplotype clades among specimens identified based on morphology as *E. sosorum*. Within each haplotype clade almost all individuals exhibit identical or near-identical cyt b sequences. One constitutes the *E. nana*-like group described above (approximately one third of those examined from Barton Springs plus all of those from the localities of uncertain status; some of these not shown in the tree are represented by incomplete sequences but all are assignable to haplotype clade). The other is a distinct group differentiated by up to about 2.5% from the *E. nana*-like haplotype clade. The latter are sister to a relatively geographically proximal ("southeastern", i.e. *Blepsimolge* clade sensu Hillis et al. 2001) but well-differentiated group (about 3.0%) consisting of *E. latitans*, *E. pterophila*, and *E. neotenes*. The type specimen of *E. sosorum* is a member of this clade (Chippindale et al. 1993; Chippindale et al. 2000), and the existence of the *E. nana*-like mt clade was only discovered later. It is important to note that *E. sosorum* was described based not only on mt differentiation, but also nuclear (allozyme) markers and morphology.

To (seemingly) complicate the mt results further, one of 14 individuals of *E. waterlooensis* for which complete or near-complete cyt b sequences are available falls within the second of the mt clades of *E. sosorum* described above (although it exhibits approximately 1.0% divergence from almost all others in the clade), and two *E. sosorum* appear (mitochondrially) most closely related to *E. waterlooensis*. In turn, *E. waterlooensis* is divided into two mt clades, one distinct among Texas *Eurycea*, and the other very similar to a subset of *E. rathbuni* (known from subterranean waters beneath San Marcos Springs, ranging south to the New Braunfels region [Chippindale et al. 2000; Chippindale 2008; and references therein]). The former haplotype clade in *E. waterlooensis* is sister to, but about 2.0% divergent from, another haplotype clade within *E. rathbuni*.

Mitochondrially, the situation appears confusing, to say the least. But again, both *E. sosorum* and *E. waterlooensis* are morphologically distinct from other Texas *Eurycea* (and usually from one another), and mtDNA does not tell the whole story.

Nuclear sequence variation:

Details of gene-by-gene and site-by-site variation are given in Table 1. As explained earlier, each site within a gene cannot be treated as evolving completely independently of the other sites (because of the tight genetic linkage) and specific alleles (i.e., chromosome-specific sequences for each gene) have not been verified in many cases. I use the terms homozygous and heterozygous to refer to specific bases at particular sites within the gene, but this should not be construed to mean that each is a distinct allele (although if sequence were only available for the region containing a variable site, the single site could define an allele). However, the patterns of variation are highly informative, and in some cases, full alleles that appear to be unique to *E. nana* or *E. waterlooensis* are identifiable. For instance, all 24 individuals of *E. nana* from San Marcos Springs are homozygous for T at RAG-1 site 4, a condition not seen in specimens examined from any other locality (thus they unquestionably possess and appear to fixed for a unique allele of this conserved gene). This is indicative of genetic isolation of this taxon. *Eurycea waterlooensis* in particular exhibits high frequencies of particular bases not seen in most other populations/taxa, although in many cases there is overlap (with substantial differences in frequency, presumably reflecting patterns of allelic variation) with the sympatric taxon *E. sosorum* at Barton Springs and in many cases the populations at Cold Spring and Blowing Sink, geographically closest to Barton Springs.

Specimens from the two localities most distant from both Barton and San Marcos Springs (Spillar Ranch Spring and Taylor Springs) display no intrapopulation nuclear sequence variation and possess sequences (and alleles) for POMC and Mc1r seen in specimens from Barton Springs, but lack the RAG-1 allele specific to *E. nana* (San Marcos Springs) and the Mc1r allele seen in *E. nana* and some individuals from Barton Springs and Blowing Sink. The low levels or lack of variation in mitochondrial and nuclear sequences (and microsatellites for Taylor Springs; see below) suggests that Taylor Springs in particular is a small, isolated population, not part of a larger continuum of ongoing genetic exchange, whereas the status of gene flow for Spillar is less clear. Almost all variation in the nuclear sequences occurs at Barton Springs, Cold Spring, and Blowing Sink (Table 1), and in many cases coincides with that seen in *E. waterlooensis* (i.e., at variable nuclear sites, most individuals at these localities, pooled, are homozygous for an "*E. sosorum* base", a small fraction are homozygous for the "*E. waterlooensis* base", and a larger proportion are heterozygous for the "*E. waterlooensis* base" and the "*E. sosorum* base"). This variation also suggests that there is considerable genetic exchange among the populations at Barton Springs, Cold Spring, and Blowing Sink (but see discussion of the microsatellite results).

With respect to the three individuals at Barton Springs that exhibit mt haplotypes inconsistent with their identification based on morphology (two *E. sosorum* of 70+ with

haplotypes extremely similar to those of the Barton Springs-specific *E. waterlooensis* mt clade, and one *E. waterlooensis* of 15 with a haplotype similar to that of the main, Barton Springs-specific *E. sosorum* haplotype group), none show nuclear sequence variation consistent with the mitochondrial haplotype of the other species, nor do they appear, across nuclear genes including microsatellite loci, to be F1 hybrids (Tables 1 and 5). This is consistent with a pattern of occasional hybridization, limited mt exchange, and likely some introgression of nuclear genes. It is not at all consistent with high levels of gene flow, and *E. sosorum* and *E. waterlooensis* clearly maintain their identities as distinct lineages despite their occurrence at the same locality (*E. waterlooensis* has only been found at Barton Springs, but surveys at Cold Spring and Blowing Sink have been extremely limited).

Microsatellite variation:

Summary statistics regarding heterozygosity for microsatellite loci are given in Table 2. Generally, levels of variation based on heterozygosity are high, as is typical for microsatellites, but most strikingly, no variation is seen for three of the five loci in Taylor Springs, further emphasizing the likelihood that it represents a small, isolated population, not part of a major path of continuous gene flow. The alleles that it possesses are seen in *E. sosorum* and some of the other populations, but for two loci (A4v2 and u6), not in *E. nana* despite the fact that this population (of those whose status is in question) is geographically closest to the range of that species.

Table 3 shows pairwise F_{st} and R_{st} values for the populations and species based on the combined microsatellite data and estimated Nm (number of migrants per generation; see Slatkin 1981, 1985, Neigel 2002). F_{ST} and R_{ST} can vary between 0 (completely free interbreeding among individuals in a geographic context) and 1 (completely different allelic composition for the markers studied, reflecting near-unambiguous isolation from gene flow). Although such measures are not necessarily directly comparable across studies (or different kinds of data), as a very rough rule of thumb, values of F_{ST} from 0.0-0.05 indicate low levels of genetic fragmentation (and thus high levels of gene flow, expressed as Nm, the number of migrants per generation); from 0.05-0.15 moderate differentiation; from 0.15-0.25 high differentiation, and from 0.25 - 1.0 very strong differentiation (e.g., Slatkin 1985, Kindt et al. 2009).

Under either measure, estimates of gene flow are highest for pairwise comparisons among Barton Springs, Blowing Sink, and Cold Spring, and to a lesser extent Spillar Ranch Spring, although not all are reciprocal (specifically, a pairing of Barton Springs with any of the others populations of uncertain status yields a high estimate of gene flow, but pairing these other populations with one another does not necessarily give such a result). One interpretation, consistent with some hydrogeologic data (e.g., Johnson et al. 2012) is that flow of both water and genes is primarily toward Barton Springs. This may also explain why the *E. nana*-like mt haplotype is seen in all of the populations of uncertain status, and at Barton Springs, but the Barton Springs (*E. sosorum*)-specific haplotype is seen only at Barton Springs.

Surprisingly, based on F_{ST} alone, estimates of gene flow are within the range consistent with population continuity for comparisons between *E. sosorum* and both *E. nana* and *E. waterlooensis* under the interpretation that even one migrant per generation is sufficient (e.g., Slatkin 1985). It is important to note that F_{ST}'s may also reflect past events (i.e., earlier gene flow and possibly shared ancestral polymorphisms), and for plethodontid salamanders in particular, Larson (1984) argued for caution in their interpretation as indicative of solely events happening in the present.

The picture changes considerably when R_{ST} values (Slatkin 1995) are used, which many would argue are most appropriate for microsatellite data. As explained briefly above, these measures take into account not only frequencies of alleles, but their relative sizes, under a stepwise model of microsatellite evolution in which repeat units are gained and lost successively; thus the greater the difference in allele sizes, the more time has elapsed since separation and the less likely it is that gene flow is ongoing. Using this approach (Table 3), the only values and corresponding Nm's consistent with substantial gene flow are those between *E. sosorum* and Blowing Sink, Cold Spring, and Spillar Ranch Spring, the geographically most proximal sites. *Eurycea nana* and *E. waterlooensis* appear to be highly isolated (as does Taylor Springs) and very unlikely to be exchanging genes with any others at a substantial frequency.

R_{ST}'s also paint a very different picture of the partitioning of genetic variance among versus within populations. Using AMOVA (Analysis of Molecular Variance; Excoffier et al. 2001), F_{ST}'s (Table 4) indicate that overall, 73% of the microsatellite variation occurs within populations/species and 27% among. R_{ST}'s suggest a much higher degree of partitioning among units (64% among and 36% among). Thus, the latter measure suggests that considering the entire assemblage, there is a high degree of fragmentation, inconsistent with widespread gene flow.

Allozymes:

Although not examined here, allozymes (nuclear protein markers) strongly distinguished *E. nana* from San Marcos Springs (which has several unique and apparently fixed alleles at different loci) from *E. sosorum* at Barton Springs (and from all other populations and species known at the time; Chippindale et al. 2000). This also argues against direct or regular gene exchange between the two species. It would be very desirable to examine allozyme loci for the populations of uncertain status, and now there is the possibility to sequence the genes for some of the loci, based on nuclear cDNA libraries developed by my former student and colleague Ron Bonett at University of Tulsa. This exciting, and could well shed further light on the situation.

Genetic introgression revisited:

Chippindale et al. (1993) showed that, at least for the samples included in their morphometric analysis, *E. sosorum* was distinguishable from other surface-dwelling species of "southeastern" surface-dwelling central Texa *Eurycea*. This appeared to be related in part to some degree of "troglobitic" (cave-associated) morphology (e.g.,

reduced eyes). This could simply be the result of an existence that includes use of subterranean and surface habitat, but given that some degree of genetic interchange probably occurs it might also reflect the influence of some input of nuclear genes from *E. waterlooensis*. Dee Ann Chamberlain, who conducts surveys of these salamanders and maintains the captive breeding colony for the City of Austin, reports (personal communication) the occurrence of a small proportion of individuals that (subjectively; i.e., no detailed analysis has been undertaken) appear "intermediate" morphologically between *E. sosorum* and *E. waterlooensis*. We plan more comprehensive molecular analysis of these to assess whether they could be F1 hybrids. Of the three individuals from Barton Springs in this study that show mt haplotypes associated with the other species (two *E. sosorum* with *E. waterlooensis* mt haplotypes, and one *E. waterlooensis* with an *E. sosorum*-like haplotype), one of the *E. sosorum* falls into the morphologically intermediate category but appears more *E. sosorum*-like, one looks like a normal *E. sosorum*, and the *E. waterlooensis* with an *E. sosorum*-like haplotype appears based on her informal assessment to be a normal *E. waterlooensis*. Nuclear data also place them within the "correct" species based on morphology. Obviously the sample sizes are small, but these do not appear to be F1 hybrids, further suggesting that occurrence of "reversed" haplotypes may be the consequence of occasional hybridization, and that these haplotypes have stayed within the populations of each species at low frequencies; there is no evidence of mt homogenization.

Finally, it is important to note that for species that diverged relatively recently, mtDNA (which generally is thought to be non-recombining and has a small effective population size due to its haploid nature and female-only transmission), retention of ancestral polymorphisms and incomplete lineage sorting often leads to mt non-monophyly (e.g., see Wiens and Penkrot 2002, McGuire et al. 2007). Thus, with respect to the situation with *E. nana* and *E. sosorum*, we may be seeing such an effect, perhaps coupled with occasional introgression (McGuire et al. describe such situations in lizards, for example). Such introgression likely would be indirect, via the geographically intermediate populations.

Major conclusions

1) Patterns of mitochondrial variation superficially suggest the potential for a "hybrid complex" in the *E. sosorum/E. nana* group, perhaps involving the distantly related species *E. waterlooensis* and even *E. rathbuni*. However, this is not supported by the nuclear sequence and microsatellite evidence, which (like earlier nuclear allozyme data) distinguish *E. sosorum* at Barton Springs from *E. nana* at San Marcos Springs. The *E. nana*-like mitochondrial sequences present in a subset of the Barton Springs population and all peripheral and geographically intermediate populations are not identical to those of *E. nana* at San Marcos Springs, suggesting that if gene flow has occurred, it likely is sporadic.

2) With respect to interactions between *E. sosorum* and *E. waterlooensis*, these taxa are highly distinct morphologically (although occasional individuals that appear

"intermediate" do occur). The *Typhlomolge* clade that includes these species appears to have diverged from the *Blepsimolge* clade that includes *E. nana* and *E. sosorum* over 10 million years ago. Levels of mitochondrial exchange between *E. waterlooensis* and *E. sosorum* appear very low, and although considerable nuclear variation is shared, frequencies of alleles and sequence substitutions at multiple loci differ greatly. It is hardly surprising that two species which are effectively sympatric would hybridize occasionally; the fact that they maintain distinct identities despite regular contact is extremely strong evidence of their status as separate evolutionary lineages. Speculatively, limited genetic exchange may even be beneficial: *E. sosorum* displays very high levels of nuclear variation (often viewed as an indicator of "genetic health"), some likely derived from *E. waterlooensis*, and a slightly "troglobitic" morphology that conceivably could even enhance use of subterranean as well as surface habitat.

3) The populations of *Eurycea* at Blowing Sink and Cold Spring (and Spillar Ranch and Taylor Springs) are indistinguishable mitochondrially from the "*nana*-like" haplotype group at Barton Springs. They share nuclear sequence substitutions or alleles, and microsatellite alleles, with *E. sosorum* that are rare or undetected in *E. nana*. Although there is evidence that this group -- Barton Spring, Cold Spring, and Blowing Sink -- may not be completely panmictic (randomly interbreeding), they appear to represent the same species, and population genetic analyses of the microsatellite data reveal substantial to very high levels of gene flow, especially between Barton Springs and both Cold Spring and Blowing Sink (although gene flow appears to be toward Barton Springs, in that the *E. sosorum* - specific mitochondrial haplotype was not seen in these populations). Spillar Ranch exhibits less nuclear variation overall, but its nuclear genetic composition is consistent with that of *E. sosorum* and not *E. nana*. The Taylor Springs population is somewhat problematic; it appears to be small and isolated, with a very low level of genetic variation and little evidence of ongoing genetic exchange with any of the other populations or species. However, its genetic composition is also most consistent with that of *E. sosorum* and the other populations, exclusive of *E. nana*.

4) *Eurycea waterlooensis* contains two distinct mitochondrial haplotype clades, one different from that in other Texas *Eurycea* (with the exception two *E. sosorum* that share this haplotype, presumably through introgression), and one very similar to that seen in some *E. rathbuni* from the San Marcos area. The pattern is very similar to that observed in *E. sosorum*, i.e., one localized haplotype group and one very similar but not identical to that from a taxon (*E. nana*) associated with the San Marcos Pool of the Aquifer. Perhaps both *E. rathbuni* and *E. nana* have occasionally contributed genes to their closest relatives; for the *E. rathbuni*/*E. waterlooensis* situation, it will be very important to look more closely at nuclear data for both species, for which detailed comparisons were not made here. Possibly too, these are cases of shared ancestral polymorphism that have involved some level of fragmentation and reconnection. Based on morphology, *E. waterlooensis* appears very distinctive regardless of haplotype, and members of both haplotype groups (plus the single individual with an *E. sosorum*-like haplotype) are relatively homogeneous with respect to both nuclear sequence substitutions and microsatellites and the respective species to which they were assigned based on morphology.

5) The patterns seen here do not support the view that there is ongoing, high-level hybridization between *E. nana* and *E. sosorum*, *E. sosorum* and *E. waterlooensis*, or *E. waterlooensis* and *E. rathbuni*. If that were the case, we would expect to see homogenization of haplotype and allele frequencies across localities and species; instead, there are distinct patterns of species, population, and regional variation across a wide range of molecular markers. But there is a "signature" of past and perhaps sporadic gene flow with an apparent directionality from south to north, overlain with occasional hybridization between species at Barton Springs. Levels of genetic variation are especially high in *E. sosorum*, and it appears that salamanders at this locality may accumulate genetic variation that flows into Barton Springs as well as from *E. waterlooensis*. This in itself represents a striking case of "evolutionary potential", and highlights the need for protection of the salamanders and the complex aquatic system that they inhabit.

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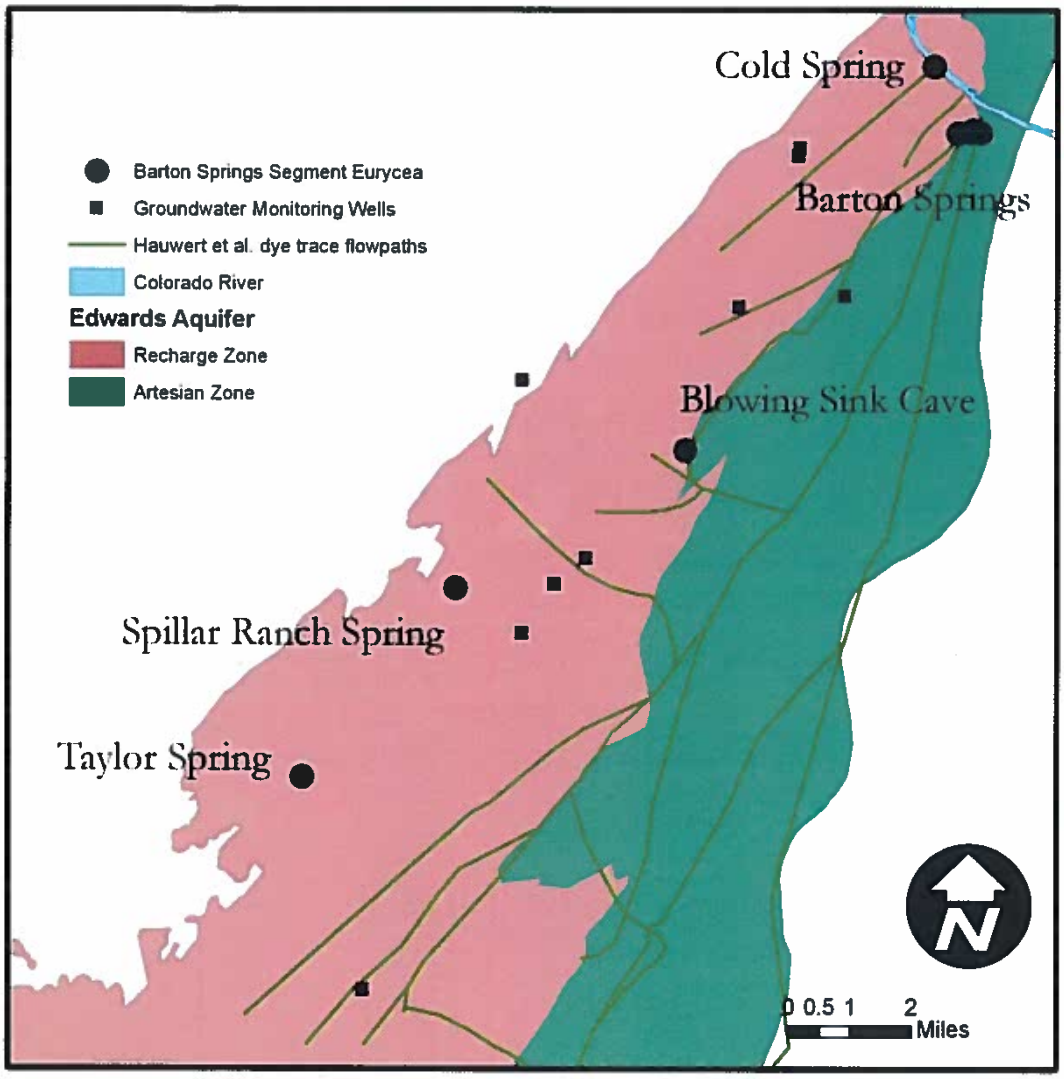

Figure 1. Primary survey and sampling region for populations of *Eurycea* of unknown status in northern Hays and southern Travis Counties. Barton Springs is the type (and thus far only confirmed) locality for *E. sosorum*; San Marcos Springs (located approximately 25 km south-southwest of the lower margin of this map) is the type and only known locality for *E. nana*. Salamanders of uncertain taxonomic status have been collected from Cold Springs, Blowing Sink, Spillar Ranch Spring, and Taylor Springs. Other potential localities in the area have been and are under investigation, including the test wells shown here.

Figure 1. Mitochondrial haplotype tree based on 979 base-pairs of the cytochrome b gene, constructed using neighbor-joining and HKY85-corrected distances. Numbers at nodes represent bootstrap values from 2000 pseudoreplicates. Only representative individuals of *E. nana* and *E. sosorum* are shown for clarity.

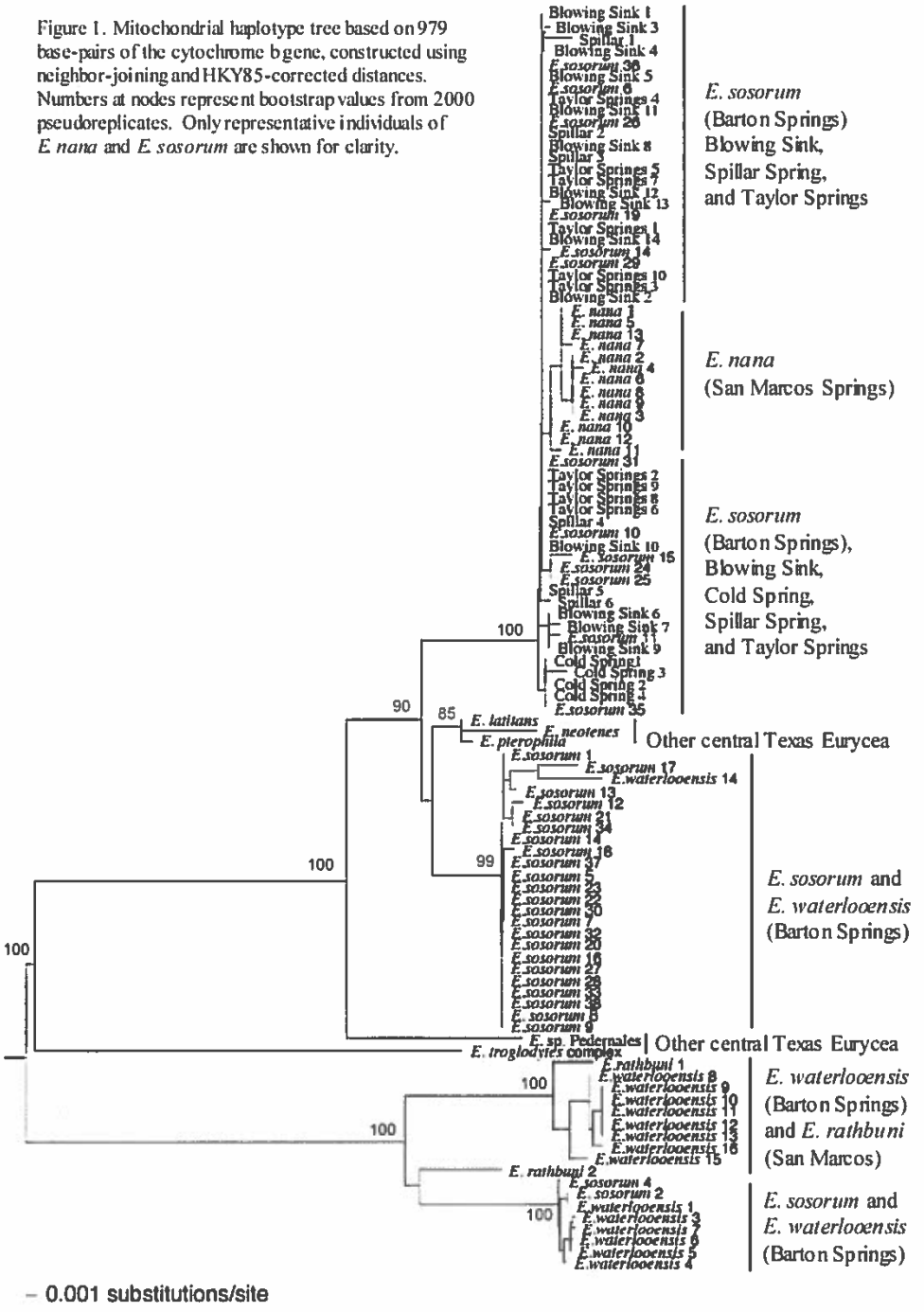

Table 1. Site-specific variation in nucleotide composition across species and populations for portions of three evolutionarily conserved nuclear genes, A. melanocortin receptor 1 (Mc1r); B. Pro-opiomelanocortin (POMC); and C. recombination-activation gene 1 (RAG-1). For POMC, the first "site" represents a covarying doublet of nucleotides. Not every individual could be scored for every site in each gene. Es represents an individual with an "*E. sosorum*" mitochondrial haplotype, En an *E. nana* haplotype, Er an *E. rathbuni* haplotype, and Ew an *E. waterlooensis* haplotype.

A. Mc1r

Species/ population	Site 1 CC	TT	CT	Site 2 GG	TT	GT
E. sosorum	17/21 Es=12 En=3 Ew=2	2/21 Es=2 En=0 Ew=0	2/21 Es=2 En=0 Ew=0	1/16 Es=1 En=0 Ew=0	12/16 Es=8 En=3 Ew=1	3/16 Es=2 En=1 Ew=0
Taylor Springs	8/8	0/8	0/8	0/8	8/8	0/8
Spillar Spring	10/10	0/10	0/10	0/7	7/7	0/7
Cold Spring	3/5	0/5	2/5	0/5	3/5	2/5
Blowing Sink	0/9	1/9	8/9	9/9	0/9	0/9
E. nana	14/14	0/14	0/14	14/14	0/14	0/14
E. waterlooensis	4/14 Ew=2 Er=3 Es=0	4/14 Ew=0 Er=3 Es=1	6/14 Ew=2 Er=4 Es=0	11/13 Ew=4 Er=7 Es=0	0/13	2/13 Ew=1 Er=0 Es=1

B. POMC

Species/ population	"Site" 1 AA/TT	AT/GT	TT/GG	Site 2 AA	GG	AG
E. sosorum	4/54 Es=3 En=0 Ew=1	15/54 Es=12 En=2 Ew=1	35/54 Es=22 En=13 Ew=0	21/56 Es=10 En=11 Ew=0	17/56 Es=15 En=1 Ew=1	18/56 Es=13 En=4 Ew=1
Taylor Springs	0/9	0/9	9/9	9/9	0/9	0/9
Spillar Spring	0/6	0/6	6/6	6/6	0/6	0/6
Cold Spring	0/4	1/4	3/4	2/5	2/5	1/5
Blowing Sink	0/8	3/8	5/8	6/9	0/9	3/9
E. nana	0/23	0/23	23/23	23/23	0/23	0/23
E. waterlooensis	8/12 Ew=1 Er=7 Es=0	4/12 Ew=2 Er=1 Es=1	0/12	0/14	10/12 Ew=3 Er=6 Es=1	2/12 Ew=1 Er=1 Es=0

Table 1 continued.

C. RAG-1

Species/ population	Site 1 CC	TT	CT	Site 2 AA	GG	AG
E. sosorum	1/54 Es=1 En=0 Ew=0	36/54 Es=28 En=15 Ew=1	15/54 Es=11 En=3 Ew=1	36/54 Es=28 En=15 Ew=1	1/54 Es=1 En=0 Ew=0	15/54 Es=11 En=3 Ew=1
Taylor Springs	0/8	8/8	0/8	8/8	0/8	0/8
Spillar Spring	0/8	8/8	0/8	8/8	0/8	0/8
Cold Spring	0/3	3/3	0/3	3/3	0/3	0/3
Blowing Sink	0/7	7/7	0/7	7/7	0/7	0/7
E. nana	0/24	24/24	0/24	24/24	0/24	0/24
E. waterlooensis	13/13 Ew=4 Er=8 Es=1	0/13	0/13	0/13	12/12 Ew=3 Er=8 Es=1	0/13

Species/ population	Site 3 AA	GG	AG	Site 4 CC	TT	CT
E. sosorum	38/54 Es=26 En=11 Ew=1	1/54 Es=1 En=0 Ew=0	15/54 Es=11 En=3 Ew=1	53/53 Es=33 En=18 Ew=2	0/53	0/53
Taylor Springs	8/8	0/8	0/8	8/8	0/8	0/8
Spillar Spring	8/8	0/8	0/8	8/8	0/8	0/8
Cold Spring	3/3	0/3	0/3	3/3	0/3	0/3
Blowing Sink	7/7	0/7	0/7	7/7	0/7	0/7
E. nana	24/24	0/24	0/24	0/24	24/24	0/24
E. waterlooensis	0/12	11/11 Ew=2 Er=8 Es=1	0/12	13/13 Ew=4 Er=8 Es=1	0/13	0/13

To next page for continuation of RAG-1.

C. Table 1. RAG-1 continued

Species/ population	Site 5 AA	TT	AT
E. sosorum	36/48 Es=24 En=11 Ew=1	1/48 Es=1 En=0 Ew=0	11/48 Es=7 En=3 Ew=1
Taylor Springs	7/7	0/7	0/7
Spillar Spring	8/8	0/8	0/8
Cold Spring	3/3	0/3	0/3
Blowing Sink	6/6	0/6	0/6
E. nana	24/24	0/24	0/24
E. waterlooensis	0/12	11/11 Ew=2 Er=8 Es=1	0/12

Table 2. Observed average heterozygosity by microsatellite locus and population. Values are percentages.

Species/ population	Locus A4v2	Locus u6	Locus u9	Locus u27	Locus u55
E. sosorum	82.1	86.1	53.6	33.3	28.8
Taylor Springs	0.0	0.0	20.0	0.0	22.0
Spillar Spring	50.0	50.0	71.4	48.6	50.0
Cold Spring	54.0	60.0	100.0	20.0	75.0
Blowing Sink	41.7	33.3	33.3	23.1	30.8
E. nana	35.7	67.6	16.7	54.1	70.6
E. waterlooensis	45.5	54.5	0.0	12.6	100.0

Table 3. A. Pairwise F_{ST} values (below diagonal) and estimated levels of gene flow (Nm, number of migrants per generation; above diagonal) based on five variable microsatellite loci for all populations and species examined. B. Pairwise comparisons based on R_{ST} values. *E. sosorum* refers to the population at the type locality, Barton Springs, *E. nana* refers to the population at the type locality, San Marcos Springs, and *E. waterlooensis* refers to the population at the type locality, Barton Springs. The other populations are geographically peripheral or intermediate.

A.

Species/ population	*E. sosorum*	Taylor Springs	Spillar Spring	Cold Spring	Blowing Sink	*E. nana*	*E. waterlooensis*
E. sosorum	0	0.588	1.907	3.375	3.575	1.436	1.309
Taylor Springs	0.298	0	0.932	0.453	0.506	0.301	0.263
Spillar Spring	0.196	0.212	0	1.211	1.430	0.741	0.645
Cold Spring	0.069	0.356	0.171	0	1.414	0.851	0.936
Blowing Sink	0.065	0.331	0.149	0.150	0	1.385	0.929
E. nana	0.148	0.454	0.252	0.227	0.153	0	1.235
E. waterlooensis	0.160	0.487	0.279	0.213	0.212	0.168	0

B.

Species/ population	*E. sosorum*	Taylor Springs	Spillar Spring	Cold Spring	Blowing Sink	*E. nana*	*E. waterlooensis*
E. sosorum	0	0.941	1.800	3.231	11.551	0.132	0.119
Taylor Springs	0.210	0	0.586	0.086	0.206	0.182	0.050
Spillar Spring	0.122	0.299	0	0.206	0.712	0.207	0.067
Cold Spring	0.072	0.744	0.548	0	0.614	0.215	0.157
Blowing Sink	0.021	0.548	0.260	0.289	0	0.169	0.199
E. nana	0.655	0.578	0.547	0.538	0.596	0	0.067
E. waterlooensis	0.677	0.832	0.790	0.614	0.677	0.789	0

Table 4. Proportion of total molecular variance, partitioned within versus among species and populations based on AMOVA analyses of microsatellite data using F_{st} and R_{st} values.

	Within populations/species	Among populations/species
F_{st}	73%	27%
R_{st}	36%	64%

Table 5. Raw microsatellite data for populations and species. Note that, particularly for *E.nana*, there are considerable missing data and some of these results need to be confirmed by replication. Bold headings indicate the microsatellite locus, and allelic identities by fragment size are indicated as two-column diploid genotypes. Individuals of *E. sosorum* ("Esos") from Barton Springs that possess *E. nana*-like mt haplotypes are indicated in the rightmost column by En; those with *E. waterlooensis*-like haplotypes are indicated by Ew. The individual of *E. waterlooensis* that possesses an *E. sosorum*-like haplotype is indicated by Es, and those with haplotypes most similar to that of E. rathbuni 1 are designated Er. Missing data are indicated by 0.0. Allele sizes have been rounded to within +/- 1 bp for consistency of identification.

Population	**A4v2**		**u6**		**u9**		**u27**		**u55**		
EsosE1	352.0	355.0	273.0	280.0	128.0	132.0	192.0	192.0	267.0	267.0	
EsosE2	340.0	348.0	254.0	273.0	140.0	140.0	192.0	192.0	267.0	267.0	
EsosE3	350.0	356.0	0.0	273.0	132.0	132.0	192.0	203.0	263.0	267.0	
EsosE4	352.0	352.0	246.0	273.0	128.0	132.0	176.0	179.0	267.0	284.0	
EsosE6	311.0	311.0	249.0	273.0	128.0	128.0	176.0	176.0	259.0	259.0	
EsosE7	340.0	352.0	280.0	280.0	128.0	132.0	192.0	192.0	267.0	267.0	En
EsosE8	344.0	352.0	229.0	264.0	132.0	132.0	196.0	196.0	267.0	267.0	
EsosE9	340.0	360.0	273.0	291.0	132.0	132.0	196.0	196.0	267.0	267.0	
EsosE10	350.0	350.0	261.0	273.0	132.0	132.0	192.0	192.0	267.0	267.0	
EsosE11	340.0	355.0	0.0	0.0	128.0	136.0	192.0	192.0	267.0	267.0	
EsosE12	340.0	352.0	268.0	273.0	128.0	132.0	178.0	192.0	267.0	267.0	
EsosE13	340.0	355.0	254.0	264.0	128.0	136.0	0.0	0.0	259.0	267.0	
EsosE14	336.0	352.0	261.0	273.0	120.0	132.0	188.0	192.0	267.0	267.0	En
EsosE15	336.0	344.0	268.0	280.0	128.0	132.0	192.0	196.0	267.0	267.0	
EsosE16	344.0	344.0	254.0	273.0	132.0	132.0	188.0	192.0	259.0	267.0	
EsosE17	340.0	340.0	246.0	268.0	128.0	132.0	192.0	192.0	267.0	267.0	
EsosE18	352.0	352.0	254.0	273.0	128.0	128.0	196.0	196.0	259.0	267.0	
EsosE19	344.0	350.0	268.0	284.0	132.0	132.0	192.0	192.0	259.0	267.0	
EsosE20	340.0	350.0	261.0	273.0	128.0	136.0	192.0	192.0	267.0	267.0	
EsosE21	340.0	352.0	229.0	254.0	128.0	132.0	192.0	192.0	267.0	267.0	En
EsosE22	340.0	348.0	264.0	273.0	132.0	132.0	200.0	212.0	267.0	267.0	En
EsosE23	0.0	0.0	229.0	229.0	128.0	132.0	192.0	192.0	259.0	267.0	
EsosE24	340.0	355.0	246.0	273.0	128.0	132.0	192.0	200.0	267.0	267.0	En
EsosE25	340.0	348.0	273.0	273.0	132.0	132.0	192.0	192.0	267.0	287.0	
EsosE26	344.0	352.0	273.0	280.0	128.0	132.0	192.0	192.0	259.0	267.0	
EsosE27	340.0	352.0	246.0	280.0	132.0	132.0	188.0	188.0	267.0	267.0	
EsosE28	348.0	352.0	246.0	273.0	128.0	128.0	192.0	192.0	267.0	267.0	
EsosE29	340.0	344.0	268.0	268.0	128.0	128.0	192.0	192.0	259.0	267.0	
EsosE30	340.0	348.0	264.0	268.0	128.0	128.0	180.0	180.0	267.0	267.0	
EsosE31	344.0	355.0	273.0	273.0	128.0	132.0	176.0	176.0	267.0	267.0	
EsosE32	332.0	340.0	260.0	264.0	136.0	136.0	192.0	192.0	259.0	267.0	
EsosE33	332.0	340.0	268.0	280.0	136.0	136.0	192.0	200.0	267.0	267.0	
EsosE34	340.0	348.0	254.0	280.0	128.0	132.0	188.0	192.0	267.0	267.0	

EsosE35	344.0	344.0	246.0	273.0	128.0	132.0	176.0	188.0	0.0	0.0
EsosE36	344.0	344.0	246.0	273.0	128.0	132.0	188.0	188.0	267.0	267.0
EsosE37	340.0	344.0	268.0	280.0	120.0	132.0	0.0	0.0	267.0	267.0
EsosE38	340.0	344.0	273.0	280.0	120.0	132.0	0.0	0.0	0.0	0.0En
EsosE39	340.0	344.0	261.0	273.0	128.0	128.0	188.0	192.0	263.0	263.0En
EsosP1	311.0	352.0	276.0	291.0	136.0	136.0	176.0	176.0	267.0	267.0
EsosP2	340.0	355.0	273.0	280.0	132.0	132.0	192.0	192.0	267.0	267.0
EsosP3	311.0	348.0	246.0	280.0	132.0	136.0	184.0	196.0	267.0	267.0En
EsosP4	348.0	360.0	264.0	273.0	132.0	132.0	192.0	192.0	267.0	267.0
EsosP5	348.0	348.0	280.0	280.0	132.0	136.0	188.0	192.0	267.0	267.0En
EsosP6	340.0	348.0	261.0	280.0	120.0	136.0	188.0	188.0	267.0	267.0En
EsosP7	0.0	0.0	261.0	280.0	128.0	132.0	188.0	188.0	267.0	267.0En
EsosP8	340.0	352.0	273.0	280.0	132.0	136.0	176.0	196.0	267.0	267.0
EsosP9	340.0	352.0	246.0	254.0	128.0	132.0	172.0	176.0	267.0	267.0En
EsosP10	340.0	344.0	0.0	0.0	128.0	132.0	188.0	188.0	267.0	267.0
EsosP11	340.0	352.0	246.0	264.0	128.0	136.0	176.0	176.0	267.0	267.0Ew
EsosP12	336.0	340.0	273.0	276.0	132.0	132.0	192.0	192.0	259.0	267.0
EsosP13	340.0	352.0	229.0	295.0	128.0	132.0	176.0	176.0	267.0	267.0
EsosP14	311.0	340.0	268.0	268.0	128.0	132.0	192.0	192.0	267.0	267.0
EsosP15	352.0	356.0	264.0	276.0	132.0	132.0	188.0	192.0	259.0	267.0
EsosP16	340.0	340.0	264.0	273.0	132.0	132.0	192.0	192.0	267.0	267.0
EsosP17	311.0	340.0	229.0	264.0	128.0	132.0	176.0	176.0	259.0	267.0Ew
EsosP18	344.0	348.0	229.0	280.0	132.0	136.0	192.0	192.0	0.0	0.0En
EsosP19	311.0	340.0	264.0	273.0	128.0	128.0	192.0	192.0	267.0	267.0
EsosP20	340.0	340.0	246.0	273.0	128.0	128.0	192.0	192.0	240.0	267.0
EsosU1	340.0	340.0	264.0	273.0	136.0	136.0	196.0	196.0	259.0	267.0
EsosU2	332.0	334.0	254.0	280.0	132.0	136.0	196.0	200.0	259.0	267.0En
EsosU3	311.0	340.0	254.0	254.0	132.0	136.0	192.0	196.0	259.0	259.0En
EsosU4	332.0	352.0	254.0	254.0	132.0	132.0	192.0	200.0	267.0	267.0
EsosU5	311.0	352.0	254.0	364.0	132.0	136.0	192.0	196.0	259.0	267.0En
EsosZ1	340.0	360.0	229.0	254.0	132.0	132.0	196.0	196.0	267.0	267.0
EsosZ2	340.0	352.0	276.0	280.0	132.0	132.0	192.0	200.0	267.0	267.0
EsosZ3	340.0	344.0	246.0	273.0	136.0	136.0	176.0	176.0	267.0	267.0En
EsosZ4	340.0	344.0	268.0	280.0	132.0	132.0	188.0	188.0	259.0	267.0
EsosZ5	340.0	352.0	273.0	273.0	136.0	140.0	192.0	192.0	267.0	267.0
EsosZ6	311.0	348.0	254.0	280.0	132.0	136.0	192.0	192.0	267.0	267.0
Taylor1902	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	267.0	267.0
Taylor1903	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	267.0	267.0
Taylor1904	0.0	0.0	280.0	280.0	136.0	136.0	188.0	188.0	256.0	267.0
Taylor1905	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	267.0	267.0
Taylor1906	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	256.0	267.0
Taylor1907	348.0	348.0	280.0	280.0	136.0	140.0	188.0	188.0	267.0	267.0
Taylor1908	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	267.0	267.0
Taylor1909	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	0.0	0.0

Taylor1910	348.0	348.0	280.0	280.0	136.0	136.0	188.0	188.0	267.0	267.0
Taylor1911	0.0	0.0	280.0	280.0	136.0	140.0	188.0	188.0	267.0	267.0
Spillar2028	0.0	0.0	276.0	280.0	136.0	136.0	188.0	192.0	267.0	267.0
Spillar2029	348.0	352.0	0.0	0.0	124.0	136.0	0.0	192.0	256.0	267.0
Spillar2030	348.0	352.0	280.0	280.0	124.0	136.0	188.0	192.0	256.0	267.0
Spillar2031	348.0	348.0	0.0	0.0	124.0	124.0	188.0	192.0	256.0	267.0
Spillar2032	348.0	348.0	268.0	268.0	124.0	136.0	188.0	192.0	267.0	267.0
Spillar2033	0.0	0.0	0.0	280.0	124.0	136.0	192.0	192.0	267.0	267.0
Spillar2034	348.0	348.0	276.0	288.0	124.0	136.0	188.0	192.0	267.0	267.0
Spillar2035	340.0	348.0	276.0	0.0	0.0	0.0	0.0	0.0	256.0	267.0
ColdSpr76	311.0	340.0	254.0	280.0	132.0	136.0	192.0	192.0	267.0	267.0
ColdSpr77	340.0	340.0	251.0	273.0	132.0	136.0	208.0	208.0	259.0	267.0
ColdSpr78	340.0	348.0	251.0	251.0	132.0	136.0	196.0	196.0	259.0	267.0
ColdSpr1924	340.0	348.0	254.0	254.0	128.0	0.0	196.0	196.0	259.0	267.0
ColdSpr1925	340.0	348.0	254.0	268.0	0.0	136.0	192.0	196.0	0.0	267.0
BlSink1125	336.0	336.0	0.0	0.0	136.0	136.0	192.0	196.0	259.0	267.0
BlSink1769	336.0	344.0	273.0	273.0	128.0	128.0	192.0	196.0	259.0	267.0
BlSink1770	344.0	344.0	280.0	280.0	128.0	136.0	192.0	192.0	267.0	267.0
BlSink1771	336.0	336.0	0.0	280.0	128.0	136.0	0.0	0.0	267.0	267.0
BlSink1772	336.0	348.0	261.0	273.0	136.0	136.0	188.0	188.0	267.0	267.0
BlSink1773	336.0	344.0	0.0	0.0	136.0	136.0	192.0	192.0	259.0	267.0
BlSink1832	336.0	336.0	254.0	273.0	128.0	136.0	188.0	188.0	267.0	267.0
BlSink1833	336.0	336.0	261.0	261.0	128.0	128.0	192.0	192.0	267.0	267.0
BlSink1834	0.0	0.0	268.0	268.0	128.0	136.0	188.0	192.0	0.0	0.0
BlSink1835	344.0	352.0	261.0	280.0	0.0	0.0	196.0	196.0	267.0	267.0
BlSink1836	336.0	336.0	261.0	261.0	128.0	128.0	192.0	192.0	267.0	267.0
BlSink1912	336.0	348.0	254.0	261.0	132.0	136.0	192.0	192.0	267.0	267.0
BlSink1913	336.0	0.0	280.0	280.0	128.0	128.0	192.0	192.0	0.0	267.0
BlSink1926	0.0	0.0	284.0	284.0	128.0	128.0	0.0	0.0	267.0	267.0
BlSink1927	0.0	0.0	280.0	280.0	128.0	128.0	196.0	196.0	0.0	267.0
BlSink1928	344.0	344.0	0.0	0.0	128.0	128.0	0.0	0.0	259.0	267.0
Enana116	352.0	355.0	0.0	0.0	128.0	128.0	0.0	0.0	276.0	276.0
Enana117	355.0	355.0	254.0	268.0	128.0	0.0	230.0	230.0	267.0	267.0
Enana119	0.0	0.0	261.0	0.0	128.0	128.0	242.0	0.0	267.0	276.0
Enana120	355.0	355.0	261.0	261.0	128.0	128.0	188.0	192.0	280.0	309.0
Enana121	355.0	375.0	261.0	273.0	128.0	128.0	242.0	242.0	273.0	309.0
Enana122	398.0	414.0	265.0	273.0	128.0	128.0	225.0	225.0	280.0	283.0
Enana123	375.0	390.0	265.0	273.0	128.0	128.0	230.0	0.0	0.0	0.0
Enana124	0.0	0.0	273.0	273.0	128.0	136.0	192.0	230.0	267.0	333.0
Enana125	0.0	0.0	0.0	0.0	0.0	0.0	242.0	242.0	0.0	0.0
Enana126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Enana127	390.0	390.0	0.0	0.0	128.0	136.0	230.0	234.0	259.0	272.0
Enana128	355.0	355.0	276.0	284.0	128.0	128.0	230.0	240.0	280.0	333.0
Enana129	0.0	0.0	276.0	284.0	128.0	128.0	242.0	242.0	280.0	280.0

Enana130	375.0	414.0	273.0	273.0	128.0	128.0	230.0	238.0	272.0	272.0
Enana132	355.0	355.0	268.0	268.0	128.0	128.0	230.0	230.0	0.0	0.0
Enana133	414.0	414.0	273.0	311.0	128.0	136.0	234.0	257.0	267.0	333.0
Enana134	355.0	355.0	268.0	315.0	128.0	128.0	230.0	230.0	276.0	280.0
Enana135	355.0	355.0	268.0	311.0	128.0	128.0	230.0	234.0	305.0	305.0
Enana136	375.0	390.0	265.0	273.0	128.0	128.0	230.0	238.0	269.0	269.0
Enana137	355.0	355.0	273.0	273.0	128.0	128.0	230.0	230.0	0.0	0.0
Enana138	398.0	0.0	273.0	273.0	128.0	128.0	230.0	242.0	267.0	280.0
Enana139	367.0	375.0	311.0	311.0	128.0	132.0	230.0	230.0	267.0	333.0
Enana140	375.0	375.0	261.0	261.0	0.0	0.0	0.0	0.0	333.0	333.0
Enana141	0.0	0.0	268.0	273.0	128.0	128.0	176.0	192.0	276.0	280.0
Enana142	375.0	375.0	259.0	259.0	128.0	136.0	0.0	0.0	267.0	267.0
Enana143	390.0	0.0	259.0	273.0	128.0	128.0	230.0	234.0	325.0	329.0
Enana248	355.0	355.0	265.0	265.0	0.0	0.0	234.0	242.0	0.0	0.0
Enana249	355.0	355.0	273.0	276.0	128.0	128.0	200.0	230.0	302.0	333.0
Enana250	372.0	372.0	273.0	273.0	128.0	128.0	230.0	230.0	267.0	0.0
Enana251	0.0	0.0	0.0	0.0	0.0	0.0	230.0	230.0	309.0	325.0
Enana252	355.0	355.0	261.0	273.0	128.0	128.0	230.0	230.0	286.0	286.0
Enana253	355.0	0.0	254.0	273.0	128.0	128.0	204.0	230.0	267.0	302.0
Enana254	388.0	388.0	261.0	273.0	128.0	132.0	192.0	230.0	276.0	313.0
Enana255	360.0	360.0	273.0	273.0	128.0	128.0	208.0	236.0	313.0	0.0
Enana256	360.0	0.0	261.0	273.0	128.0	128.0	230.0	230.0	280.0	305.0
Enana257	0.0	0.0	268.0	273.0	128.0	128.0	212.0	230.0	325.0	337.0
Enana258	360.0	384.0	261.0	273.0	128.0	128.0	230.0	230.0	0.0	0.0
Enana259	380.0	384.0	259.0	273.0	0.0	0.0	236.0	240.0	302.0	309.0
Enana260	352.0	375.0	261.0	268.0	128.0	128.0	232.0	240.0	280.0	302.0
Enana261	0.0	0.0	268.0	273.0	128.0	128.0	236.0	236.0	276.0	302.0
Enana262	360.0	0.0	265.0	273.0	128.0	128.0	238.0	238.0	309.0	325.0
Enana263	0.0	0.0	254.0	273.0	128.0	128.0	192.0	230.0	325.0	329.0
Enana264	360.0	360.0	261.0	273.0	128.0	128.0	230.0	230.0	272.0	272.0
Ewat1993	311.0	394.0	229.0	0.0	136.0	136.0	172.0	172.0	236.0	267.0
Ewat1994	311.0	311.0	229.0	242.0	128.0	128.0	172.0	176.0	240.0	259.0Er
Ewat1995	307.0	344.0	229.0	246.0	132.0	132.0	176.0	176.0	240.0	259.0Er
Ewat1996	311.0	315.0	229.0	242.0	136.0	136.0	176.0	176.0	259.0	263.0Er
Ewat1997	311.0	315.0	229.0	246.0	0.0	0.0	172.0	176.0	240.0	259.0Er
Ewat1998	0.0	0.0	242.0	246.0	128.0	128.0	0.0	0.0	232.0	240.0
Ewat1999	311.0	311.0	229.0	229.0	128.0	128.0	0.0	0.0	240.0	259.0Er
Ewat2000	311.0	311.0	229.0	246.0	128.0	128.0	172.0	176.0	236.0	259.0Er
Ewat2001	311.0	311.0	229.0	229.0	128.0	0.0	0.0	0.0	240.0	259.0
Ewat2002	311.0	311.0	229.0	229.0	128.0	0.0	172.0	176.0	240.0	259.0Es
Ewat2003	311.0	311.0	229.0	229.0	132.0	132.0	192.0	192.0	232.0	240.0Er
Ewat2004	315.0	340.0	229.0	229.0	128.0	128.0	172.0	196.0	240.0	259.0

TRANSPORTATION AND NATURAL RESOURCES
STEVEN M. MANILLA, P.E., COUNTY EXECUTIVE

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TxDOT Austin District Environmental Coordinator
Texas Department of Transportation
PO Box 15426
Austin, TX 78761-5426

August 13, 2014

Re: SH 4SSW Draft Environmental Impact Statement
Travis County TNR Staff Comments

Dear Sir or Madam:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the proposed State Highway 45 Southwest (SH 45SW) in Travis and Hays Counties.

Please see the attached comments prepared by staff of the Travis County Department of Transportation and Natural Resources.

We look forward to continuing to work with TxDOT, CTRMA and other project stakeholders to ensure the best possible outcome for this project. In particular, we anticipate extensive collaboration to meet obligations described in the interlocal agreement between CTRMA and Travis County to consult with the United States Fish and Wildlife Service on protections for Flint Ridge Cave.

Sincerely,

Steven M. Manilla, P.E.,
County Executive
Travis County TNR

Jon A. White
Director, Natural Resources & Environmental
Quality Division
Travis County TNR

Attachment: Travis County TNR Staff Comments on the SH 45SW DEIS

Travis County TNR Staff Comments

General Comments

- The Travis County Commissioners Court approved support of the SH 45 SW project by a resolution of October 22, 2013, and by approval of an Interlocal Cooperation Agreement to construct the project between Hays County, Travis County, and the Central Texas Regional Mobility Authority on March 18, 2014.

- Travis County and the Central Texas Mobility Authority (CTRMA) have emphasized that the project will employ the best and most environmentally sensitive design and implementation. To support this, the design for the project should include a clearer exposition of and commitment to an elevated level of environmental management. The Environmental Commissioning process used by the City of Austin in its Water Treatment Plant 4 project serves as an example that may be followed.

- The protections described in the DEIS suggest that they provide superior protection for Flint Ridge Cave. The Balcones Canyonlands Conservation Plan (BCCP), a federal Endangered Species Act Section 10A permit held by Travis County and the City of Austin, requires this cave to be protected. The Interlocal Cooperation Agreement between Travis County and CTRMA requires consultation with the U.S. Fish & Wildlife Service (USFWS) to determine what, if anything, is necessary to avoid Travis County's violating the BCCP permit. To achieve this, environmental management via best management practices (BMPs) for design, construction and operations may need to be carried out in a manner even more protective of Flint Ridge Cave than is described in the DEIS.The purpose of the EIS to fully describe the project's environmental impacts and consequences. Accordingly, it needs to address all BCCP issues. The consultation process with USFWS described in the interlocal agreement between CTRMA and Travis County will be important in addressing this issue.

- Through consultation with TxDOT, we are advised that TxDOT has a record of success with roadway projects passing over and near sensitive karst features like Flint Ridge Cave that are, like other BCCP karst features, subject to USFWS jurisdiction. TxDOT has established a "standard of care" in their projects that has provided adequate protection as determined by USFWS. This "standard of care" should be fully elaborated in the FEIS. It should be explained, documented and linked to design, construction and operations of the current project.

- The DEIS describes an extensive collection of BMPs that are intended to provide for protection of surface and groundwater resources and provides for an Environmental

Compliance Management Plan (ECMP) with an on-site compliance manager. The BMPs and ECMP in the DEIS are not yet organized into a clear, coherent strategy. The essential features of the proposed environmental protections and the implementation procedures should be more fully and cohesively elaborated in the FEIS. The framework for how these protections and procedures will be implemented in design, construction, and operations should be described with specific clarification and commitment that specific details will be fully and comprehensively addressed at each stage of project development, i.e. design, construction and operations.

- To the County's knowledge, USFWS has never required a subsurface drainage study for a road project potentially affecting a BCCP cave. However, the City of Austin is currently conducting such a study for Flint Ridge Cave. The risk that the study will result in major project redesign appears extremely low. However, because the project sponsors are committed to the highest levels of environmental protection, final project design should remain contingent on the final result of the study. The FEIS should reflect that the final design and construction of the project will be adjusted as appropriate to reflect any relevant findings from that study.

Detailed Comments by DEIS Section

EXECUTIVE SUMMARY:

General: The DEIS doesn't mention Travis County as a regulatory authority in the area such as our MS4 designation; our roadway operation and maintenance responsibilities for non-State/CTRMA roads affected by the project (Bliss Spillar); and our water quality protection rules.

ES.3
COMMENT: We suggest including "improved safety" in the first sentence, as a project purpose.

ES.4
Preferred Alternative, states that the Build Alternative was identified as it excludes frontage roads throughout the project's length.

COMMENT: Are there any other aspects of the short segment between Bliss Spillar and FM 1626 not identical to the long segment between Bliss Spillar and Loop 1? If so, they should be

pointed out. The Shared Use Path is shown to have its own alignment. Could the alignment be established closer to the road (especially at the bridge crossing) to help minimize disturbance of the land?

ES.5

Build Alternative

Land Use:

The seventh sentence states the lack of frontage roads and the limited number of access points constrain opportunities for potential development immediately adjacent to the roadway.

COMMENT: Could tolls be added as a factor? Will development adjacent to the road between FM1626 and Bliss Spillar be constrained or precluded? We suggest using the word "preclude" instead of the word "constrain." We suggest revising the last sentence to read "The proposed project's influence on development is not anticipated to be significant, especially given the Austin area's high rate of growth overall and the transportation improvements such as the widening of FM1626 already occurring in the study area." Could it be said that full control of access, as is proposed between Loop 1 and FM1626, will result in less impact than partially controlled access as has been experienced adjacent to the segment between FM1826 and Loop 1?

Socioeconomic Resources:

The third sentence in the first paragraph lists reasons why the area transportation network would improve if the proposed roadway is built.

COMMENT: Can "improved safety" be added? The last sentence in the first paragraph states that the proposed project may also connect to a trail system and bike-accessible shoulders on FM1626. Do the trail and bike-accessible shoulders currently exist? We suggest adding that the proposed project offers some protection from wildfires by providing a wide fire break, providing access to the area for fire fighters and access for wildfire risk-reduction projects. Could it be added that the project will improve emergency response times in this area?

Air Quality:

The second sentence states, "The VMT in the study area estimated for the build alternative is slightly higher than for the no build alternative because the proposed roadway would increase access, attracting trips that would not otherwise occur in the area." Can it be changed to read "...because the proposed roadway would improve travel time, attracting trips...."

Noise:

The analysis indicated there will be four affected residences but it would not be cost effective to install noise barriers.

COMMENT: Did the analysis consider noise coming from the top of the bridges that will be built at Bliss Spillar and will the elevated noise source make a difference in the decision not to include noise abatement?

Impacts to the Natural Environment

Geology and Soils

The second sentence states that "...erosion would be minimized by using proper techniques and best management practices during construction."

COMMENT: The project will be constructed with extra attention given to protecting the environment. We suggest stating that BMPs that exceed the industry standard for development will be used. Can standard BMPs be compared against the higher standard BMPs that will be used here or in the main document?

Waters of the US and Wetlands

COMMENT: Does this section need to be revised to include the proposed rule change currently under review by USEPA and USDOD? Is this issue moot since the DEIS states that no 404 permit will be required?

Water Quality

The fourth sentence states, "Impacts would be minimized by the use of robust BMPs during roadway construction and operation."

COMMENT: We suggest including a side-by-side comparison of the BMPs used for development and the BMPs that will be used for this project?

COMMENT: What level of storm event will the project BMPs be designed to capture and treat? The last sentence in the last paragraph lists the regulations that are in place to protect water quality from the effects of induced development. These include TCEQ regulations requiring BMPs and preparation of SW3Ps, City of Austin drainage/water quality requirements and ordinances, and Section 404 of the Clean Water Act.

COMMENT: The County is an MS4 operator. Should its SWMP be included on this list?

Hazardous Materials

COMMENT: Is it intended to prohibit post-construction truck traffic from using this road?

No Build Alternative

Impacts to human environment

Socioeconomic Resources

COMMENT: It appears that there will be no difference in the no-build or build alternatives.

Air Quality

COMMENT: It appears that there will be no difference in the no-build or build alternatives.

Noise

COMMENT: No build results in more congestion and neighborhood cut-through traffic which brings more road noise.

Waters of the US and Wetlands

COMMENT: There are no wetlands on the project so will there be no difference in the build or no-build alternatives

Threatened and endangered species

COMMENT: It appears that there are no endangered or threatened species or habitat so will there be no difference in the build or no-build alternatives

Page ES-9, Air Quality

There is no discussion regarding the emission emitted from idling vehicles as it relates to the build alternative. The reduction in delays will reduce the idling vehicles. In turn the emissions from these vehicles will be reduced by reduction in travel times.

Page ES-12, Waters of the US & Wetlands

Isn't a 404 permit required if any work is performed within the 100 year floodway? Will any of the bridge structure be within the floodway? Even if it is covered by a nationwide permit it should be stated here.

Section 3.0 Affected Environment & Environmental Consequences

3.1 Land Use

Local Plans and Policies

The discussion of City of Austin & Travis Country jurisdiction is not complete or clear.

Within the Austin ETJ, the City and County have joint jurisdiction for many projects

- Subdivisions are subject to joint City-County review under the Chapter 30 Single Office.
- Non-subdivision development is subject to separate development permits by City & County.
- In unincorporated areas both the County and the City of Austin have authority as permitted Municipal Separate Storm Sewer Systems (MS4s).

Proposed Land Uses

This section does not account for joint jurisdiction of City and County for environmental review and development permits.

3.6 Edwards Aquifer/Groundwater Resources

The project area is acknowledged to be a highly sensitive environment. The DEIS proposes an Environmental Compliance Management Plan (ECMP) with specific guidelines and an on-site compliance manager. This is appropriate for any large scale or significant project when environmental issues are important. However, the ECMP as presented does not appear adequate to address the heightened environmental concerns of this project or to rise to the level of intensive scrutiny promised by CTRMA and TxDOT.

During working group sessions, COA staff described a more intensive approach described as Environmental Commissioning. We urge CTRMA and TxDOT to expand their approach to environmental management to include environmental commissioning. This is especially important to ensure against degradation of Flint Ridge Cave. The EC lead must be empowered to direct, alter or stop work with the primary goal of ensuring protection of FRC.

The ECMP as presented is very preliminary and conceptual. Numerous Best Management Practices are referenced but are described in concept rather than in specific detail and linked to specific design features.

One way to address this is by strengthening the Environmental Management Plan to encompass the Environmental Commissioning concept.

Much of the discussion of BMPs suggests that the BMPs will be used to meet TCEQ standards. We strongly urge the DEIS be revised to emphasize that these standards will be the minimum requirement for performance. This is consistent with the plan stated goal of achieving better than minimum compliance standards. Higher level environmental protection is specified at various times in the DEIS, but should be specifically and consistently addressed where TCEQ standards are referenced.

Many of the proposed protection measures are indefinite and conditional. For example: "phased construction would be considered" (p. 151). References like these should be made more definite.

A number of BMPs are detailed in the appendices even though they have been rejected elsewhere in the DEIS. Please clarify.

Project representatives indicated on July 25, 2014, that at least 19 karst features near or within the project right-of-way remain under investigation and delineation. It appears that some locations may affect design of the project in a substantial way, such as Jubilee. Additional efforts are ongoing to ascertain the subsurface drainage area of Flint Ridge Cave. Further assessment of potential impacts, roadway design, alignment alternatives, and appropriate construction/post-construction storm water control measures must be undertaken after the remaining data and information become available, considering the potential impacts of the project on surface and groundwater quality.

On page 311 of the DEIS, the placement of water quality ponds as construction phase sediment basins is identified to occur "as soon as practical". It is strongly recommended that placement of all construction BMPs occur prior to disturbance of every drainage area prior to each particular phase of the project.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057

August 12, 2014

Mr. Carlos Swonke
Texas Department of Transportation
Environmental Affairs Division
125 East 11th Street
Austin, Texas 78701-2483

RE: CSJs 1200-06-004 & 1200-07-001

Dear Mr. Swonke:

Thank you for your letter of June 26, 2014, requesting the U.S. Fish and Wildlife Service (Service) review and provide comments on the Texas Department of Transportation's (TxDOT) draft Environmental Impact Statement (dEIS) for the proposed construction of State Highway 45 Southwest (SH 45 SW), CSJs 1200-06-004 & 1200-07-001, located in Travis and Hays Counties, Texas. The proposed project is being developed by TxDOT in conjunction with the Central Texas Regional Mobility Authority (CTRMA). The proposed SH 45 SW would be a new location, 4-lane tolled roadway connecting the southern terminus of State Loop 1 (MoPac) with Farm-to-Market (FM) 1626, a distance of about four miles. There is no Federal nexus for this project, therefore, the dEIS has been prepared in accordance with the Texas Administrative Code, 43:1 Chapter 2, and is not required to comply with the National Environmental Policy Act (NEPA) requirements for an EIS.

There are several issues in the dEIS related to Service trust resources that we believe must be examined in greater detail. Some of the issues are project related effects to listed species, the golden-cheeked warbler (GCW), the Barton Springs (*Euyacea sosorum*) and Austin blind salamanders (*Euyacea waterlooensis*), and the Bone Cave harvestman (*Texella reyesi).* The Service is also concerned about adverse effects to Flint Ridge Cave, which could violate the requirements of the Balcones Canyonlands Conservation Preserve (BCCP) Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP). The Service has issues with the dEIS related to the evaluation of reasonable alternatives and a lack of sufficient information to be able to verify TxDOT's conclusions on potential project effects. Lastly, there is no mention in the dEIS of the requirements of the 1990 Consent Decree reached in settlement of the lawsuit on the original SH 45 project. Without describing the requirements of the Consent Decree, the Service is not able to determine whether TxDOT is complying with the project and consultation requirements in the Consent Decree.

As stated above, the dEIS prepared by TxDOT is a state environmental review document and does not comply with the NEPA requirements for content, coordination, review, oversight, approval, and dispute resolution. With no Federal nexus, TxDOT's requirements to comply with other Federal regulations are also minimized. For example, a project with a Federal nexus must consult with the Service under section 7 of the Endangered Species Act (Act) for any action which "may effect" a listed species or designated critical habitat, whereas, for a project without a Federal nexus the requirement is that the project effects must not result in a violation of section 9 of the Act, which prohibits "take" of a listed species. Take is defined in the Act as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct."

The dEIS states that the Service is a participating agency in the preparation of the dEIS and includes a copy of the Service's letter acknowledging that we would be a cooperating agency on the EIS development. Our agreement to be a cooperating agency was based on the (erroneous) assumption that the EIS would be a Federal document, based on the NEPA requirements and implementing regulations. Because it is not, and there are no mention of cooperating or participating Agency status in the Texas Administrative Code related to the development of a state EIS, this information should be removed from the EIS.

The dEIS was submitted to the Service and other agencies for public comment before some of the environmental studies undertaken for the project, or their final reports, were complete; including the geologic assessment and karst invertebrate surveys, and GCW habitat assessment and surveys. Because the final study reports were not included as appendices to the dEIS, detailed information on the methods and results were not available for review by the Service and other resource agencies. The information in these reports is vital in allowing reviewing agencies to determine if appropriate methods were followed to justify the effect analysis described in the dEIS.

The Texas Administrative Code requires an evaluation of "all reasonable alternatives satisfying the purpose and need..." of the project. The Service does not believe TxDOT has fulfilled this requirement in the dEIS. All of the alternatives mentioned in Chapter 2, except for the preferred and no action alternatives, were eliminated from consideration before any evaluation of their environmental effects. In addition, there are insufficient details for each proposed project alternative to accurately evaluate their environmental effects. There is no description of the actions, such as construction methods, necessary to implement each of the project alternatives. Construction methods that would avoid or minimize project related effects must be considered for an accurate evaluation of the project effects. There is also no discussion about TxDOT's ability to modify the proposed alignment within the existing ROW in order to avoid or minimize effects to the GCW, karst habitat, Flint Ridge Cave, or other resources. The dEIS also does a poor job of describing the environmental effects of the no action alternative or of comparing the effects of the no action alternative to the effects of the preferred alternative.

The Service does not believe the dEIS does an adequate job of evaluating the direct and indirect effects of the proposed project on listed species. The project analysis is generally limited to the

ROW and does not take into consideration the potential for adverse effects to occur beyond the limits of the ROW. Instead of evaluating the projects effects on listed species, TxDOT has made determinations on whether the preferred alternative would result in "take" of listed species, based on limited supporting data and analysis. Again, the requirements detailed in the Texas Administrative Code require an evaluation of the environmental impacts of the project, including direct, indirect, and cumulative effects. The Texas Administrative Code does not limit the evaluation to "take" of federally protected species. The evaluation in the dEIS should determine if the proposed project would affect listed species. If the effect to a listed species rises to the level of harm (defined as: any act which kills or injures federally protected species, including significant habitat modification or degradation that significantly impairs their essential behavior patterns and results in death or injury) or harass (defined as: the disruption of a listed species essential behavior patterns, including feeding, breeding, and sheltering), then TxDOT should consult with the Service under section 10 of the Act in order to avoid any potential section 9 "take" violation.

The Service believes the current analysis of indirect and cumulative effects, located in Appendices D and I respectively, are insufficient. Indirect effects are those that are caused by the project but occur in a different location or later in time. Most of the dEIS discussion on water quality effects to the Edwards Aquifer, in Section 3.6, would be indirect effects. In addition, most of the discussion in Appendix I, covering cumulative impacts, relates to the direct or indirect effects of this project, instead of an evaluation of the past, present, and reasonably foreseeable future actions that may result in effects to the environment. We recommend the effects evaluation in the dEIS be redone to more accurately reflect potential direct, indirect and cumulative environmental effects and that all three types of effects be included in the Affected Environment/Environmental Consequences section of the dEIS, rather than having the indirect and cumulative effects separated into appendices.

TxDOT states that their GCW habitat assessment did not identify GCW habitat within the ROW, however in the dEIS (page 215) TxDOT describes the vegetation in the ROW as "generally composed of juniper-bluestem savannas and oak-juniper woodlands." Both of these habitat types can be used by GCW for feeding, breeding, and sheltering. TxDOT states in Appendix I that there are 52 acres of GCW habitat in the ROW, but did not quantify how much of that 52 acres would be affected by the proposed project. The Service's survey protocol for GCW states that if any area of the assessed property meets the vegetative associations described in Campbell (2003), and a determination of non-GCW habitat was made, a report of the GCW habitat assessment must be provided to the Service for review within five days of the determination. This has not been done, and based on the information in the dEIS, the Service would likely not have concurred with a negative GCW habitat findings.

One of the difficulties in interpreting the effects to the GCW, as well as other environmental factors, are the multitude of differing special scales used in the dEIS evaluation. The dEIS does a poor job defining the action area of the proposed project and relating the environmental effects analysis to the action area. Instead, TxDOT uses ROW, study area, resource study area, project corridor, and area of influence in various analyses in the dEIS, often for the same resource,

including the GCW. The action area is normally defined as the area where direct and indirect project related effects would occur. The Service believes the action area should be specifically defined in the dEIS and used consistently in the effect analysis throughout the document.

In regards to TxDOT's analysis of potential project effects to the GCW, your "no take" determination is based on a single year of GCW surveys within the SH 45 SW ROW and the negative GCW habitat assessment. Documentation for these evaluations was not included in the dEIS, nor submitted to the Service, for review. A single year of presence/absence surveys, for a highly mobile, migratory species like the GCW, is not sufficient information on the long-term use of the area by GCW to justify a no take determination. The GCW survey protocol also requires the surveys to extend 300 feet beyond the edge of the ROW.

Surveys in the project area over the past decade have documented habitat use by GCW within City of Austin (CoA) Water Quality Protection Lands (WQPL), located adjacent to the SH 45 SW ROW. Baer Engineering detected GCWs on the Tabor and Bliss Spiller Tracts in 2009, but not in 2010. The Nature Conservancy detected GCW on the Tabor Tract in 2000, but not on the Bliss Spiller Tract. SWCA did not record any GCW during multiple surveys on the Tabor Tract in 2002, but did detect them in 2003. GCW surveys on WQPL in the project area conducted in 2013 and 2014 documented the presence of GCWs. The dEIS notes in several locations that GCW have been confirmed to use WQPL and specifically states that a GCW nested and fledged a juvenile on the eastern boundary of the ROW, west of Bear Creek, in 2013. With previous surveys indicating that GCWs can be absent one year, then detected the next, and recent survey results indicating that GCW are using habitat in the area of the project, we believe that three consecutive years of negative GCW presence/absence surveys must be completed, in accordance with written Service survey protocol, before TxDOT can justify its proposed "no take" determination. The Service believes that the proposed project would result in harassment of GCWs if they are located in habitat within or adjacent to the ROW during construction.

The Service is concerned that the geologic assessment and karst feature surveys were not complete at the time the dEIS was issued. Without the karst assessment being finalized before the issuance of the dEIS, TxDOT is not able to fully and accurately describe the number of karst features, particularly within the Recharge Zone, that occur within the ROW or would be directly or indirectly affected by the project. Because the current karst study is incomplete, TxDOT based their karst analysis on a study from 2007. Supporting documentation was not included in the dEIS to justify the analysis of impacts to karst habitat or listed karst invertebrates. An example of the importance of a complete karst geologic survey can be seen in the different number of features found in the 2007 survey, compared to the ongoing study. During the 2007 karst investigation of the ROW, only 21 features were identified. However at the July 25, 2014 Technical Work Group meeting, the karst consultant stated that 220 features had been found thus far, including 19 that are still under investigation. The Service believes that even more features will be uncovered as soil disturbance occurs during project construction. In the dEIS, TxDOT states that only seven known features would be permanently sealed due to the implementation of the preferred alternative, however it is unknown if that number is based on the 2007 survey or the one currently being conducted. Also, TxDOT does not discuss how they plan to address

impacts to previously unknown subsurface karst features if they are discovered during construction and contain protected karst species.

The Service believes it was premature for TxDOT to make a "no take" determination for listed karst species before all karst geologic feature and invertebrate surveys were complete and the Service has had the opportunity to review the survey findings. The Service is concerned about potential affects to *Texella reyesi*, a listed karst invertebrate species. We acknowledge that the identification of the specimen from Barker Ranch Cave #1 is in question, since the specimen is a juvenile and no other *T. reyesi* have been found south of the Colorado River. However, until scientific findings indicate otherwise, the Service considers Barker Ranch Cave #1 to be occupied by *T. reyesi* and we believe there is potential for *T. reyesi* to be located in other karst features in the project area. After the issuance of the dEIS, an additional *Texella* specimen was collected in Barker Ranch Cave #1 and submitted to Dr. Darrell Ubick, a *Texella* taxonomist at the California Academy of Sciences, for identification. Hopefully, Dr. Ubick will be able to identify the new specimen and provide guidance on whether *T. reyesi* is likely to occur south of the Colorado River.

The Service has repeatedly expressed our concern about the potential for water quality degradation to occur in the Barton Springs Segment of the Edwards Aquifer associated with TxDOT projects located within the aquifer's Recharge Zone and the effects that degradation could have on the Barton Springs and Austin blind salamanders. Within the project ROW, 277.4 acres occur within the Recharge Zone, with an additional 31.7 acres in the Transition Zone. There are currently about 17.2 and 5.7 acres of impervious cover in the Recharge and Transition Zones, respectively, within the project ROW. Construction of the preferred alternative would add about 47.9 acres of impervious cover in the Recharge Zone and 4 acres in the Transition Zone.

TxDOT is proposing to treat construction and roadway runoff so that about 90 percent of TSS would be captured by water quality best management practices (BMPs). In addition to TSS, other water quality pollutants, including heavy metals, petrochemical products, nutrients (nitrates and phosphorus), bacteria, and organic carbon, are associated with highway construction and road runoff. TxDOT is required to develop and implement a stormwater pollution prevention plan and a water pollution abatement plan for the project, but they were not complete prior to the issuance of the dEIS and details of specific preventative and treatment actions that would be implemented were not available for review. Instead, TxDOT discusses general methods that could be implemented to maintain water quality standards under normal environmental conditions.

The implementation of water quality BMPs does not guarantee that adverse effects to water quality would be avoided and TxDOT admits in the dEIS that some level of pollutants would remain after water quality treatment. Occasional severe storm events could result in failure of BMPs as the storage capacity of temporary controls are overwhelmed and result in a significant amount of pollutants entering the aquifer, either through karst features within or adjacent to the ROW, such as Flint Ridge Cave, or through Bear Creek.

TxDOT proposes to develop an environmental compliance management plan and hire an environmental compliance manager to oversee water quality monitoring and oversee inspection of BMPs. However, repairing a BMP after it has failed would not reduce or mitigate for the environmental impacts resulting from that failure. This is especially relevant since the water quality BMPs would also be used as hazardous material traps. In order to ensure no adverse effects, TxDOT would need to be able to prevent outflow from the BMPs after hazardous material spills, including during extreme weather events. Complete elimination of water quality impacts would require the retention of all runoff from the site, during construction, and roadway, once the project is completed. Water quality monitoring is needed pre-construction to establish baseline conditions, then during and post construction, in Bear Creek, Flint Ridge Cave and other recharge locations, to evaluate and monitor effects of the project.

The Service continues to be concerned that indirect impacts to Flint Ridge Cave would alter the biological conditions of the cave sufficiently to remove its conservation value as a BCCP mitigation feature in accordance with their Habitat Conservation Plan and section 10 Incidental Take Permit. TxDOT proposes to direct construction and road runoff, funneled by a 2,900 foot berm, into catchment basins for treatment, then release the treated runoff into Bear Creek. However, maintaining the water quality in Bear Creek is extremely important to the aquifer. Barrett et al (1985) estimate that approximately 85 percent of the recharge into the Barton Springs Segment of the Edward Aquifer occurs in the beds of the creeks that cross the recharge zone. TxDOT states that the amount of surface runoff entering Flint Ridge Cave would not be altered by the project. TxDOT proposes to replace an equivalent amount of surface runoff into Flint Ridge Cave as the amount that would be diverted into the detention BMPs. However, the specifics of how this would be accomplished, or what effect it would have on other karst features in the project area, were not addressed in the dEIS.

TxDOT has not delineated, nor addressed impacts to the Flint Ridge Cave subsurface drainage basin. Recharge into Flint Ridge Cave has been measured to reach Barton Springs in as little as 2 days and recharge from Bear Creek can reach Barton Springs in 2 to 4 days. Construction of SH 45 SW would result in the conversion of about 5.6 acres, or about 13 percent, of the 43.8 acre Flint Ridge Cave surface drainage basin into impervious cover. It is unclear if that total includes only the road surface, or if it also includes the proposed berm, the area between the road and berm where TxDOT proposes to install an impermeable bentonite clay layer to prevent infiltration of runoff before it has been treated, or the area of the other treatment BMPs. In addition to the increase in impervious cover, during project construction TxDOT would be removing about 159 acres of the 309 acres of vegetation currently in the ROW. Surface vegetation within 345 feet of the cave footprint is necessary to support the troglobitic species which occupy the cave. An infiltration study is currently underway to examine the groundwater infiltration influences on Flint Ridge Cave. The Service believes the information from this study is a significant step in understanding the project's impacts to the cave, and ultimately to the Edwards Aquifer, from surface pollutants related to the SH 45 SW construction and operation.

Our last issue with the dEIS relates to the proposed project's effects on wildlife that are not protected under the Act. TxDOT relies heavily on the Texas Parks and Wildlife Department's

Natural Diversity Database (NDD) for your determination of effects to rare species. However, the NDD is not a complete database of the locations of rare species and should only be used as a tool in the evaluation of affects to these species, along with information on the species life history and habitat, and site specific habitat evaluations. The NDD only presents information of where species have been found and reported. If an area has never been surveyed or survey results were not reported to the appropriate agencies, reliance on the NDD alone may provide inaccurate information on the species that may be present in that project area. Effects to non-listed species are also readily dismissed in the dEIS, stating that any wildlife in the project area will be displaced to adjacent habitat. However, that conclusion does not take into consideration the habitat quality or the carrying capacity of the adjacent areas for any displaced species. The dEIS also does not take into account the wildlife that will be directly harmed by construction of the project. We recommend TxDOT revise the dEIS discussion related to state listed and non-listed wildlife resources.

We will continue to work with TxDOT to address these issues and we appreciate your continued efforts to conserve sensitive species throughout the state. If you have any questions or comments, please contact Darren LeBlanc at 512-490-0057 (ext. 247) or 512-608-7591.

Sincerely,

Edith Erfling

Edith Erfling
Field Supervisor
Coastal Ecological Services Field Office

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APPENDIX M
BIOLOGICAL EVALUATION AND TECHNICAL REPORTS

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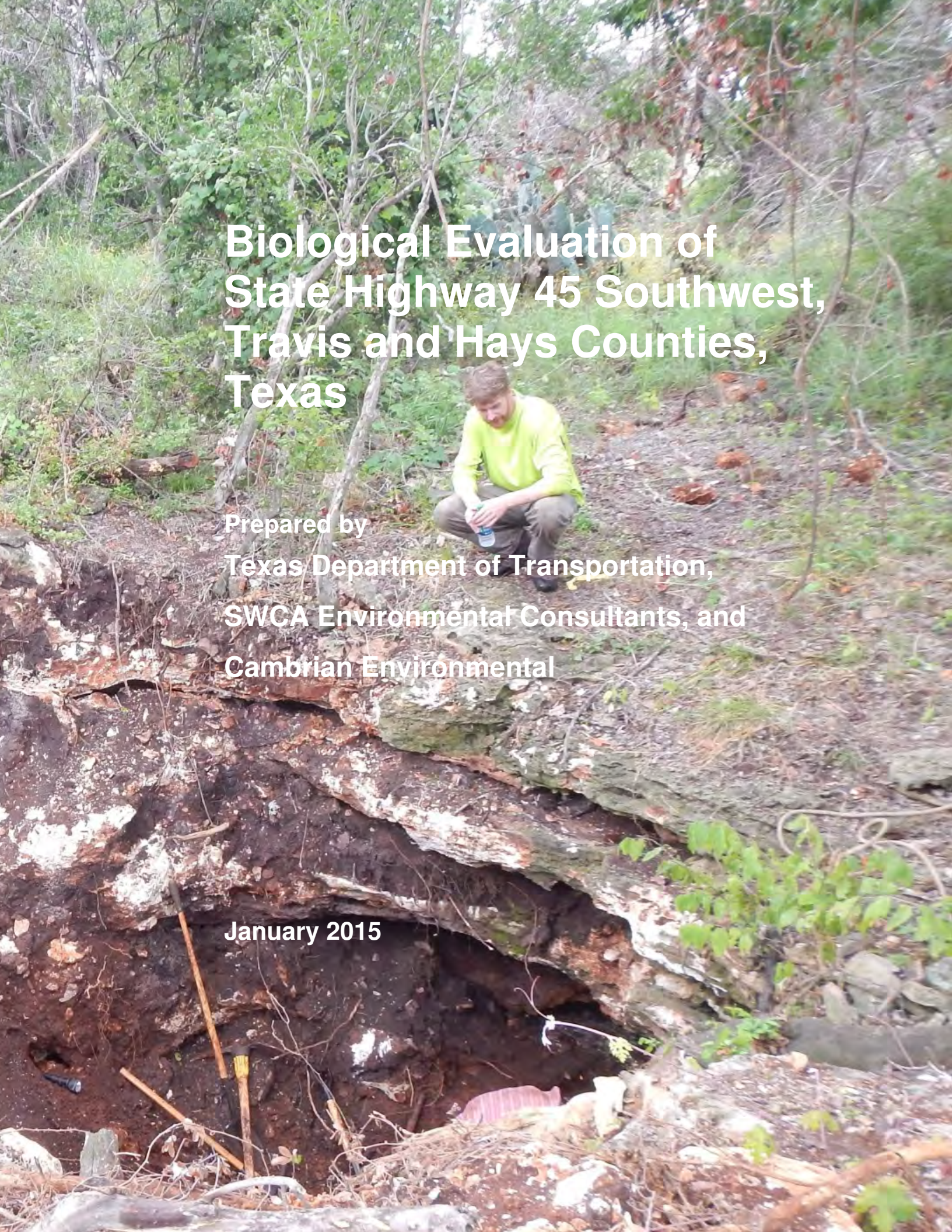

Biological Evaluation of State Highway 45 Southwest, Travis and Hays Counties, Texas

Prepared by

Texas Department of Transportation,

SWCA Environmental Consultants, and

Cambrian Environmental

January 2015

BIOLOGICAL EVALUATION OF STATE HIGHWAY 45 SOUTHWEST, TRAVIS AND HAYS COUNTIES, TEXAS

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1.0 INTRODUCTION

SH 45SW has been proposed to be constructed by the Texas Department of Transportation (TxDOT) in conjunction with the Central Texas Regional Mobility Authority (CTRMA) in southern Travis and northern Hays counties, Texas. The approximately northern two-thirds of the state-owned SH 45SW right-of-way (ROW) lie within the recharge zone for the Barton Springs Segment of the Edwards Aquifer. Subsequent to acquisition of the ROW by the State of Texas, the City of Austin acquired several parcels of land on either side of the ROW for the purpose of water quality protection.

SH 45SW is proposed to be constructed as a four-lane, divided toll road approximately 3.6 miles long running from the south end of MoPac to Farm-to-Market Road 1626 (FM 1626) and crossing Bear Creek and Bliss Spillar and Old Bliss Spillar roads. A draft environmental impact statement (DEIS) prepared for the proposed project identified a potential area of disturbance that encompassed approximately 309.09 acres (TxDOT 2014). This area included segments of MoPac and existing SH 45 where bridges would be built within existing ROW to connect to SH 45SW, as well as segments of FM 1626, Bliss Spillar Road, and Old Bliss Spillar Road that would also be used to provide connections to SH 45SW.

The existing sections of MoPac and SH 45 ROW and connecting segments of FM 1626, Bliss Spillar Road, and Old Bliss Spillar Road that were included in the potential area of disturbance in the DEIS have been excluded from review in this biological evaluation. The area considered in this evaluation is limited to the section of state-owned ROW that would be newly disturbed as a result of construction of SH 45SW. This section extends from the south end of MoPac to FM 1626 and encompasses approximately 179.68 acres (Figure 1). The area identified in red outline on Figure 1 is referred to in this biological evaluation as the SH 45SW ROW or the *Project Area*.

A description of the proposed project was included in the DEIS and an updated description will be provided in the final environmental impact statement (FEIS). As currently planned, approximately 100.66 currently vegetated acres within the ROW would be permanently disturbed by construction of SH 45SW and construction of the roadway as proposed would result in creation of approximately 52.44 acres of impervious cover.

A shared-use path is proposed to be constructed adjacent to SH 45SW, mostly on the south or west side of the roadway to the north of Bliss Spillar Road, and on both sides of the roadway south of Bliss Spillar Road. The shared-use path would cross Bear Creek via a bridge. A parking lot and pedestrian underpass are proposed to be constructed at the north end of SH 45SW to accommodate the Violet Crown Trail being planned by the City of Austin and the Hill Country Conservancy.

The purpose of this biological evaluation is to examine and identify the expected biological consequences of the construction and use of SH 45SW.

Figure 1. Location of the SH 45SW alignment.

The proposed roadway would be paved and then covered with Permeable Friction Course (PFC) asphalt. Bridges would be constructed with concrete. The proposed roadway alignment and profile has been designed to avoid known sensitive karst areas to the extent practical. To that end, approximately 90 percent of the SH 45SW roadway between FM 1626 and MoPac would be built on fill to control direction of surface water runoff. Those sections of road built on fill would be elevated and separated from grade level by retaining walls. Fill used for construction purposes is expected to primarily consist of cobble.

Also to reduce possible impacts to sensitive karst areas, total roadway width is proposed to be minimized north of Bear Creek. This segment of roadway would be constructed without a median, with westbound and eastbound travel lanes separated by concrete barriers for safety purposes. The concrete barriers would have transverse slots molded into them to facilitate drainage across the travel lanes and to allow small mammals to cross the roadway. In accordance with TxDOT design standards, each slot would be no greater than 4 inches high and 24 inches long.

Stormwater controls and water quality best management practices (BMPs) would be employed to minimize the potential for water quality impacts (see Section 3.0). These would include the use of vegetative filter strips on $\leq$ 6:1 slopes and the use of water quality swales parallel to the roadway. Runoff from bridges would be treated by water quality ponds. Bridges would be constructed for: the mainlane overpass of Bliss Spillar Road and water quality pond; the mainlane overpass of Bear Creek and water quality pond; the mainlane overpass of Danz Creek, water quality ponds, and MoPac; and a connector overpass for westbound (northbound) SH 45SW to northbound MoPac over Danz Creek.

The proposed roadway would provide connections to FM 1626, Bliss Spillar Road, the southern terminus of MoPac, and the existing SH 45, which currently extends west from the south end of MoPac to FM 1826. Based on discussions with the City of Austin, TxDOT is considering the enclosure of the SH 45SW right-of-way (ROW) between MoPac and Bear Creek with a game fence, with the fence maintaining integrity on its south end by extending under the bridge over Bear Creek.

2.0 EXISTING CONDITIONS

Topography within and adjacent to the SH 45SW ROW consists primarily of gently rolling uplands dissected by shallow drainages. Elevation within the ROW ranges from approximately 850 feet above mean sea level (amsl) near its northern end, down to approximately 700 feet amsl near the southern end. Surface water runoff in the northern portion of the ROW drains east toward tributaries of Slaughter Creek. The central portion of the ROW drains into Bear Creek. The southern end of the ROW drains to Little Bear Creek. All three creeks join Onion Creek, which ultimately flows into the Colorado River in eastern Travis County.

2.1 GEOLOGY

The SH 45SW ROW lies on the eastern margin of the Edwards Plateau and within the Balcones Fault Zone. Bedrock geology of the ROW consists of Cretaceous sedimentary deposits, including various members of the Edwards Group limestone, and the Georgetown, Del Rio Clay, and Buda Limestone formations (SWCA and Cambrian Environmental 2014a). The Edwards Group is susceptible to dissolution by groundwater and the formation of caves and other karst features. It underlies the northernmost approximately 2.4 miles of the SH 45SW ROW. The Edwards Group in the northerly approximately 1.9 miles of the ROW is represented mostly by exposures of the Kirschberg Evaporite and Grainstone members of the Kainer Formation, with a limited amount of the Dolomitic Member of this formation also exposed. The next approximately 0.5 mile of the ROW to the south is mostly underlain by the Leached and Collapsed Member of the Person Formation of the Edwards Group, along with a limited amount of exposure of the Regional Dense Member of this formation (SWCA and Cambrian Environmental 2014a). Of the aforementioned members of the Edwards Group, the Leached and Collapsed and the Kirschberg Evaporite are generally the most porous and permeable.

The exposure of the Edwards Group in the ROW ends to the south at a fault. To the south of this fault, the SH 45SW ROW is mostly underlain by the Del Rio Formation, with exposure of the Buda Formation present in the southernmost approximately 0.2 mile of the ROW.

Regional geologic maps depict the ROW as being crossed by multiple geologic faults, most of which strike to the northeast (SWCA and Cambrian Environmental 2014a). Due to the interplay of faulting and erosion, the thickness of the Edwards Group beneath the ROW ranges from approximately 200 feet in the north end to over 400 feet to the south near Bliss Spillar Road (SWCA and Cambrian Environmental 2014a).

2.1.1 Edwards Aquifer/Barton Springs Segment

The northerly approximately 3.4 miles of the SH 45SW ROW lie within what has been mapped as the recharge zone of the Edwards Aquifer by the Texas Commission on Environmental Quality (TCEQ). The recharge zone boundary as drawn by the TCEQ is an administrative boundary that generally follows the limits of surface exposure of the Edwards Aquifer strata. Within the ROW, the recharge zone coincides with surface exposure of the Edwards Group and Del Rio Formation. The southernmost portion of the ROW underlain by the Buda Formation lies outside the recharge zone but within what is referred to as the Edwards Aquifer transition zone, where recharge to the aquifer still has some potential to occur through faults and fractures in what are comparatively thin overlying layers.

Regionally, the Edwards Aquifer is hydrologically divided into three segments, the San Antonio Segment, the Barton Springs Segment, and the Northern Segment. The Northern Segment lies north of the Colorado River and does not have a hydrologic connection with the Edwards Group exposed in the SH 45SW ROW. The San Antonio and Barton Springs segments are part of a continuous exposure of the Edwards Group,

with separation between the two segments created by a groundwater divide located in northern Hays County. In general, the divide is the result of a comparatively high volume of water recharging the aquifer within a corridor that contains Onion Creek and the Blanco River. Recharge in this corridor creates a high pressure dome or ridge of groundwater that drains off both to the south and north (Smith et al. 2012).

To the south of the groundwater divide in the San Antonio segment, primary discharges from the aquifer are San Marcos Springs in Hays County and Comal Springs in Comal County. To the north of the divide, the primary discharge from the aquifer is Barton Springs in the City of Austin, Travis County. During periods of extremely low flow, such as that which can be experienced during prolonged drought, it is expected the high pressure ridge of groundwater disappears (drains away) and water from the San Antonio Segment can flow northward through the Onion Creek/Blanco River corridor to discharge at Barton Springs (Smith et al. 2012).

The recharge zone within the SH 45SW ROW is located north of the groundwater divide and south of the Colorado River, and so is part of the Barton Springs Segment of the Edwards Aquifer. It has been estimated by Slade (2014) and Slade et al. (1986) that at least 75% and perhaps up to approximately 85% of the water that recharges the Barton Springs Segment enters the aquifer from the channels of six major creeks that cross the recharge zone (their watershed area up-gradient of the recharge zone is referred to as the contributing zone). From north to south these creeks are Barton, Williamson, Slaughter, Bear, Little Bear, and Onion. The remaining 15% to 25% occurs as a result of infiltration from upland areas, including lesser drainages, probably some leakage from adjacent aquifers and, under extremely low flow conditions, influx from the San Antonio Segment (Smith and Hunt 2004).

Groundwater dye tracing studies have been conducted using caves and sinkholes in the vicinity of the ROW as dye injection points. These studies show that water recharging the aquifer through open karst features in the general area reaches Barton Springs within 3 to 28 days, depending on flow conditions (Barton Springs/Edwards Aquifer Conservation District [BS/EACD] 2002, 2006). Discharge from the Barton Springs Segment occurs largely as spring flow at Barton Springs and some lesser springs (e.g., Cold Springs) and as the result of pumping (Smith and Hunt 2004). Slade (2014) reports the long-term mean discharge at Barton Springs is 51 cubic feet per second (cfs), which equates to approximately 36,947.6 acre-feet per year.[1]

2.1.1.1 Recharge

Recharge does not occur uniformly across either the recharge or transition zones. Karst features, which are often formed along fault-related fractures, provide avenues for point aquifer recharge within the recharge and transition zones. While a relatively small amount of recharge does occur through diffuse infiltration across the aquifer outcrop,

[1] 53 cfs x 60 sec/min. x 60 min/hr x 24 hr/day x 365.25 days/yr = 1,672,552,800 cubic feet/year (cfy). 1,672,552,800 cfy ÷ 43,560 cubic feet/acre-foot = 36,947.603 acre-feet.

most recharge in the Barton Springs Segment occurs where overland flow of water is concentrated by topography within drainage and creek channels and within internally draining sinkholes. As indicated, it is believed that approximately 75% to 85% of recharge to the Barton Springs Segment occurs in the channels of the six major creeks that cross the recharge zone (Slade 2014, Slade et al. 1986). The SH 45SW ROW lies within portions of the Slaughter, Bear, and Little Bear watersheds; Bear Creek crosses the SH 45SW ROW. No open-mouthed recharge features are present in the Bear Creek channel within the ROW (SWCA and Cambrian Environmental 2014a), but recharge to the aquifer undoubtedly occurs in the Bear Creek channel within the ROW through fractures and fissures.

Flint Ridge Cave, which occurs on City of Austin land close to the eastern edge of the SH 45SW ROW, is recognized by the City of Austin as an important upland point recharge feature for the Barton Springs Segment of the Edwards Aquifer (Li and Spillar 2014). Its surface drainage area is overall relatively flat (yet uneven at the micro-scale), making its total extent difficult to measure with confidence. The total surface drainage area of Flint Ridge Cave has been measured by Veni (2000) as over 40 acres and as approximately 69 acres by Hauwert (2010). The 69-acre area was identified using coarse-scale topography and is considered herein as unreliable. TxDOT recently used LIDAR and aerial survey data to identify the Flint Ridge Cave drainage basin as approximately 55.5 acres (SWCA and Cambrian Environmental 2014b).

Upland areas on the Edwards Plateau receive comparatively low levels of precipitation and are subjected to high temperatures during the summer, leading to high evapotranspiration rates (Sanford and Selnick 2013). A water budget computed for the Barton Springs Segment of the Edwards Aquifer indicates that approximately 85% of precipitation is lost to evapotranspiration and another 9% is lost to runoff (Woodruff 1984, Slade et al. 1986). The City of Austin, which is the nearest city for which long-term weather data is available, received an average of 32.15 inches of rain per year during the period of 1981-2010 (National Weather Service 2013). With regard to Flint Ridge Cave, an 85% loss of precipitation to evapotranspiration (with no water lost to runoff) conservatively suggests that Flint Ridge Cave could on average contribute approximately 22.3 acre-feet of water per year to the Barton Springs Segment.[2]

In a study of the recharge contribution of Flint Ridge Cave, Hauwert et al. (2005) estimated that the Flint Ridge Cave surface drainage area contributed approximately 17.9 acre-feet of recharge by measuring water carried through a weir to the mouth of the cave during the period of February 2004 – January 2005. Hauwert et al. (2005) reported that approximately 41.73 inches of rainfall fell in the Flint Ridge Cave surface drainage area during their period of study. This is almost 10 inches greater than the Austin annual average of 32.15 inches used in the theoretical calculations above, yet the greater rainfall total led to a recharge volume smaller than the theoretical amount expected based on drainage area and assumed 85% loss of precipitation to

[2] 32.15 in. of rainfall/yr x (1.0 - 0.85) = 4.823 in/yr or 0.402 ft/yr available for recharge; 55.5 ac. x 0.402 ft/yr = 22.311 ac.-ft./year.

evapotranspiration. With an 85% loss of precipitation to evapotranspiration, 41.73 inches of rainfall should be able to yield 28.95 acre-feet of recharge from a 55.5-acre drainage area. This is approximately 62% more than the volume measured by Hauwert et al. (2005).

In absence of knowledge of site species soil characteristics, the difference between the volume of recharge measured by Hauwert et al. (2005) and the theoretical expectation based on total rainfall during the period of study could be attributed to water infiltrating the ground through the soil layer rather than by being carried to the mouth of Flint Ridge Cave. However, in 2005, TxDOT commissioned a detailed site-specific investigation of soil conditions in the SH 45SW ROW by Wilding (2005). During the investigation, professional soil scientists and hydrogeologists conducted field studies within the Flint Ridge Cave drainage basin that included the use of dye tracers and trenching to examine depth of dye penetration. A key finding of this study was:

> "*If one integrates the mean dye-stained area that was observed in horizons at or just above the limestone interface (prorated for the percentage of study area comprised of thin, moderately thick, and thick soils), only about 0.3% of the infiltrating soil leachates would reach the limestone interface. If one considered only the thin soils, the most probable recharge would range from 0-4%, with a 95% confidence interval. Thus, the amount of surface rainfall that ever reaches the limestone interface is remarkably low. With many of the limestone solution pits and joint planes plugged with clay, the surface water recharge through soils to Flint Ridge Cave is negligible*" (Wilding 2005).

Thus, the difference between theoretical and actual recharge in the Flint Ridge Cave surface drainage basin cannot be attributed to diffuse infiltration through the soil layer. Instead, the lower than expected recharge contribution indicates the effective surface drainage area of Flint Ridge Cave must often be less than the 55.5 acres measured by TxDOT owing to higher than expected losses to evapotranspiration. Given that the Flint Ridge Cave drainage area is relatively flat, it can be expected that much of the rain falling in its drainage area during lighter precipitation events does not reach the mouth of the cave because runoff is slowed or stopped by micro-topography, allowing it to evaporate or be taken up by plants and soil. Only during heavier events is rainfall likely capable of reaching the cave from throughout the limits of its drainage basin.

With the volume of surface water recharging through soils in the Flint Ridge Cave surface drainage basin considered as negligible (Wilding 2005), the amount of recharge measured by Hauwert et al. (2005) suggests that approximately 90.7% of precipitation falling in the Flint Ridge Cave drainage area is lost to evapotranspiration. Use of this higher percentage of loss with the 32.15 average inches of rainfall per year suggests that, on average, the Flint Ridge Cave surface drainage area provides approximately 13.8 acre-feet of recharge to the Barton Springs Segment per year. This volume represents approximately 0.04% of the mean annual discharge at Barton Springs and approximately 0.15% to 0.25% of the mean annual discharge at Barton Springs expected to result from recharge occurring outside of the six major creek channels.

2.1.2 Karst Features

A survey for karst features (caves, sinkholes, etc.) within the SH 45SW ROW was performed on behalf of TxDOT by SWCA and Cambrian Environmental in 2014. The karst survey was performed in support of preparation of a geologic assessment as required under the TCEQ Edwards Aquifer Protection Program. The purpose of a geologic assessment is to identify any sensitive aquifer recharge features present within the study area so that impacts to the aquifer can be avoided and minimized to the extent practicable. A karst feature survey had been performed previously within the SH 45SW ROW in 2007 by aci (2007). The 2014 karst survey covered the 309.09-acre area of potential disturbance as identified in the DEIS and not just the area considered in this biological evaluation.

Subsequent to the 2007 survey, the USFWS published a 5-year review of the endangered Bone Cave harvestman (*Texella reyesi*), which identified the species as occurring in a cave located on City of Austin land to the west of the SH 45SW ROW (USFWS 2009). All other caves identified in the literature as supporting Bone Cave harvestman are located 16 miles or more to the north of the SH 45SW ROW, north of the Colorado River.[3] The identification of Bone Cave harvestman by the USFWS in a cave located south of the Colorado River and in general proximity to the SH 45SW ROW required TxDOT to consider the potential for construction of SH 45SW to adversely impact this species. The 2007 survey resulted in the identification of more than 300 features of various types (e.g., burrows, tree root pulls, sinkholes, solution cavities, etc.), of which 21 were considered potentially significant karst features (aci 2007). Flint Ridge Cave was one of the 21 features and not all 21 features were located within the boundaries of the SH 45SW ROW. The 2007 survey did not include excavation of features, so the potential for any of the 21 features other than Flint Ridge Cave to support cave-dwelling species was unknown.

Given the amount of time that had passed since 2007, it was considered likely that as a result of erosion and effects of drought, some karst features could be found in the ROW in 2014 that were not visible in 2007, and that some of the previously identified features could have changed in appearance and sensitivity. The 2014 survey was performed to address the potential for conditions in the ROW to have changed since 2007 and to excavate potentially significant karst features as a first step in the endangered karst invertebrate due diligence process (which is to determine whether listed invertebrates occur in a project area and whether any additional steps are necessary to address possible impacts to these species). It also incorporated the larger survey area to include land contemplated to be used for connection of SH 45SW to MoPac.

[3] Identification of Bone Cave harvestman from the cave west of the SH 45SW ROW by the USFWS was based on the collection of one juvenile specimen. Juvenile *Texella* are not readily identifiable by species. This specimen is now known not to represent *T. reyesi* and probably represents *T. mulaiki*, a cave-adapted *Texella* known to occur in Flint Ridge Cave and other caves in Hays County and southern Travis County (Ubick 2014).

All but one of the potentially significant karst features identified by aci (2007) was re-found in 2014. The feature that could not be re-found is believed to have been buried by mulch created during post-2007 construction by the Lower Colorado River Authority (LCRA) of an overhead transmission line adjacent to the SH 45SW ROW. The 2014 survey resulted in the identification of more than 220 landscape features considered to have at least some limited potential to be karst features with connection to the aquifer. All 220+ features were excavated during the spring and summer of 2014 to determine their origin (karst or non-karst), extent, and sensitivity with regard to aquifer recharge potential.

A total of 27 of the 220+ features were determined to be of karst origin and were divided into sensitive and non-sensitive categories. The sensitive features include 5 caves, 4 sinkholes, and 8 solution cavities with the capacity for rapid recharge. The non-sensitive features include epikarstic solution cavities and superficial weathering surfaces (rillenkarren) which were encased in low-permeability terra rossa paleosol (SWCA and Cambrian Environmental 2014a). Biological surveys were performed in humanly accessible sensitive features. Bait traps were used to assess potential for karst invertebrates to occur in one feature too small to permit human entry.

Table 1 lists the investigation results for the 21 potentially significant karst features identified by aci in 2007, and provides the identification numbers used for those same features by SWCA/Cambrian Environmental. The table also identifies 8 sensitive features newly found by SWCA/Cambrian or that were not addressed by aci; 4 of these features are located in areas that aci did not survey in 2007.

2.1.2.1 Karst Feature Descriptions

Five caves (excluding Flint Ridge Cave) identified during the geologic assessment were determined through biota collections to support cave-adapted karst invertebrates. These features are described below. One of these features (SH 45 Cave) is located outside of the area considered in this biological evaluation but is mentioned here for sake of completeness. Flint Ridge Cave is described in Section 2.1.2.2.

Cow Pattie Cave (F-18): An approximately 20-foot x 20-foot and 10-foot deep sinkhole previously known as Cow Pattie Sink that was excavated using a backhoe to reveal humanly accessible void space. Two sections of crawling space were excavated manually. These spaces lead down to an approximately 20-foot long crawling passage at a depth of approximately 15 feet that ends at a 6-inch diameter conduit with slight air flow. Biota collections and bait traps resulted in identification of presumed Bandit Cave spider (*Cicurina bandida*), a ground beetle (*Rhadine austinica*), and a millipede (*Speodesmus* sp.) in the feature.

Hat Sink (F-23): A sinkhole that was approximately 15 feet in diameter that was excavated by backhoe to a depth of 10 feet and further excavated by hand to a depth of 15 feet. Excavation did not reach humanly accessible void space, only narrow conduits. One millipede (*Speodesmus* sp.) was encountered during excavation. Bait traps placed in two conduits failed to capture any additional karst fauna.

Table 1. Potentially Significant Karst Features Identified by aci and Investigation Results for those Features and other Newly Identified Features.

aci Feature Number	Cambrian/ SWCA Feature Number	Sensitive? Yes/No	Excavated? Yes/No	Biota Collections? Yes/No	Comments
2503	F-16	Yes	No	No	On private land outside of TxDOT ROW; potential sinkhole
2504	F-17	No	Yes	No	Non-karst closed depression
2505	F-18 (Cow Pattie Cave)	Yes	Yes	Yes	Formerly known as Cow Pattie Sink; contains karst fauna (see text).
2525	F-23 (Hat Sink)	Yes	Yes	Yes	Sinkhole (see text)
2537	F-32	No	Yes	No	Plugged with clay; no obvious signs of karst extent
2554	F-48/F-49	No	Yes	No	Non-karst closed depression
2603	F-59	No	Yes	No	Non-karst closed depression
2619	F-61	No	Yes	No	Solution cavity
2652	N/A	N/A	No	No	Outside of ROW
2653	N/A	N/A	No	No	Outside of ROW
2662	F-64	Yes	Yes	Yes	Cave (w/ F-65); contains karst fauna (see text)
2694	F-110 (Jubilee Cave)	Yes	Yes	Yes	Formerly known as Jubilee Sink (see text)
2723	F-119	No	Yes	No	Non-karst closed depression
2732	Flint Ridge Cave	Yes	No	No	Large cave on City of Austin land (see text)
2733	N/A	Unknown	No	No	Not re-found. Believed buried under mulch deposits.
2813	F-123	No	Yes	No	Non-karst; closed depression
2881	F-22	Yes	Yes	No	Solution cavity
2882	N/A	N/A	No	No	Outside of ROW
2885	F-65	Yes	No	Yes	Open cave (w/ F-64); contains karst fauna (see text)
2888	F-55	Yes	No	No	Fractures in drainage
2890	F-63b	No	No	No	Closed depression; outside of ROW
Features Newly Identified in 2014					
---	F-29	Yes	Yes	No	Solution cavity
---	F-41	Yes	Yes	No	Solution cavity; sinkhole; no karst invertebrate habitat found
---	F-62a	Yes	No	No	outside of ROW
---	F-157a,b (SH 45 Cave)	Yes	No	Yes	Known cave previously excavated; inside MoPac ROW; current setback will be maintained
---	F-170 (MoPac Sink)	Yes	No	No	Sinkhole; inside MoPac ROW; current setback will be maintained
---	F-161	Yes	No	No	Fractures in drainage
---	F-163	Yes	Yes	No	Solution cavity

F-64/F-65: Two features located approximately 70 feet apart on the north slope of Bear Creek believed to be connected by unexcavated passage. At the surface, F-64 consists of an approximately 1-foot x 1-foot hole in bedrock, with subsurface passage trending toward F-65. F-65 is an open cave with an approximately 1.5-foot x 3-foot mouth connected to a 4-foot vertical passage that leads to a low room about 40 feet in diameter. Drains from the room exhibit constant air flow. Of all caves in the SH 45SW ROW, this feature exhibited the highest diversity of karst fauna. Biota collections and bait trapping produced presumed Bandit Cave spider, another spider (*Tayshaneta* sp., possibly *T. sandersi*), *Rhadine austinica*, *Speodesmus* sp., and the silverfish-like *Texoreddellia* sp.

Jubilee Cave (F-110): An approximately 20-foot x 20-foot and 3-foot deep sinkhole previously known as Jubilee Sink that was excavated by backhoe, resulting in an approximately 8-foot x 12-foot and 4-foot deep pit. Manual excavation from the base of the pit produced a twisting passage that drops to a depth of approximately 15 feet and ends at bedrock fissures that exhibit consistent airflow. Karst fauna identified in this feature as a result of biota surveys and bait trapping was limited to the millipede *Speodesmus* sp. Karst habitat quality is considered poor owing to the vertical character of the feature and lack of permanent darkness and stable temperature/humidity.

SH 45 Cave (F-157-a, F-157b): A previously excavated cave located in TxDOT ROW at the interchange of MoPac and existing SH 45. It has a 5-foot diameter vertical shaft that drops 8 feet to a bedding plane parting that extends about 15 feet before the cave drops another 4 feet to the center of an approximately 50-foot long linear, tubular room. Additional, tighter passage with consistent airflow extends down from the northeast end of the room. Existing setbacks to this feature are expected to be maintained. Biological surveys (no bait trapping used) resulted in collection of presumed Bandit Cave spider, *Texoreddellia* sp., *Speodesmus* sp., and another millipede, *Cambala speobia speobia*.

2.1.2.2 Flint Ridge Cave

Flint Ridge Cave is one of the most notable caves in the Austin area. The entrance of the cave is located approximately 150 feet east of the SH 45SW ROW on land owned and managed by the City of Austin. The entrance of Flint Ridge Cave is contained within a large sinkhole. Relative to most caves in the Edwards Aquifer recharge zone, the cave has an anomalously large surface catchment area. It is known as one of the most significant upland recharge features in the Barton Springs Segment, although, as discussed in section 2.1.1.1, its importance relative to the volume of recharge occurring within major creek channels is minor. The SH 45SW ROW crosses through the west side of the Flint Ridge Cave surface drainage area. The cave contains several rooms, drops, and passages and extends to a depth of 152 feet (Elliott 1997). Water that recharges the Edwards Aquifer via Flint Ridge Cave helps support two federally listed endangered species, the Austin blind salamander (*Eurycea waterlooensis*) and Barton Springs salamander (*Eurycea sosorum*), although it is later concluded herein that no adverse impacts to either of these species are expected from the proposed project (see section 4.3.1).

Flint Ridge Cave is one of 62 caves identified for protection in the Balcones Canyonlands Conservation Plan (BCCP). The BCCP is a regional habitat conservation plan for Travis County developed by the City of Austin and Travis County and approved by the USFWS through issuance of a Section 10(a)(1)(B) incidental take permit. It allows non-federal entities to gain Endangered Species Act (ESA) authorization for projects occurring in Travis County through purchase of Participation Certificates from the BCCP, with the City of Austin and Travis County committing to preserve and manage a specified amount of endangered species habitat (with assistance from their managing partner, the LCRA, as well as cooperation from The Nature Conservancy and Travis Audubon Society) in exchange for the ability to provide stream-lined ESA permitting for their constituents, along with other benefits associated with the conservation of greenspace.

Flint Ridge Cave is not known to contain any federally listed threatened or endangered karst-dwelling invertebrates, but does support two non-listed arthropods (a spider, *Cicurina bandida*, and a beetle, *Rhadine austinica*) included in the BCCP as covered species. Under the USFWS "No Surprises" Rule, as long as the City of Austin and Travis County operate the BCCP as agreed upon with the USFWS (including the protection of caves containing non-listed covered species), the purchase of Participation Certificates would authorize the take of non-listed covered species such as *C. bandida* if in the future they are listed as threatened or endangered. In addition to the aforementioned species, Flint Ridge Cave is also known to contain these troglobitic species: *Cambala speobia speobia, Speodesmus* sp., *Texoreddellia* sp., and a harvestman, *Texella mulaiki*. The expected effect of construction and use of SH 45SW on the ecological integrity of Flint Ridge Cave is discussed in Section 4.4.

2.2 SOILS

Soil character is influenced by composition of the underlying bedrock as well as a variety of other factors. Most of the ROW underlain by the Edwards Group is covered by Speck stony clay loam (Soil Conservation Service 1974). This soil unit is mapped as covering all of the SH 45SW ROW from its north end south to the Bear Creek corridor, and most of the ROW south of Bear Creek to Old Bliss Spillar Road. Soil in the Bear Creek corridor is mapped as mixed alluvial land. A restricted area between Bear Creek and Old Bliss Spillar Road is mapped as being covered by Crawford clay soil (Soil Conservation Service 1974).

From Old Bliss Spillar Road to the Hays County line, soils mapped as present in the ROW include Speck stony clay loam, Speck clay loam, and Heiden clay. From the Hays County line south the FM 1626, soils mapped within the ROW include the Tarpley clay (equivalent to Speck clay loam), Rumple-Comfort association (equivalent to Speck stony clay loam), Heiden clay, and, in a strip running directly adjacent to FM 1626, Eckrant-Rock outcrop complex (Soil Conservation Service 1984).

The U.S. Department of Agriculture has devised a classification system for soils based on their hydrologic properties. Soils are classified within one of four groups: A, B, C, or D. The Crawford, Eckrant, Heiden, and Tarpley soils within the ROW lie in the "D"

group, meaning they have a very slow infiltration rate, a very slow rater of water transmission, and very high potential for runoff when thoroughly wet (U.S. Department of Agriculture 1986).

The mixed alluvial land present along Bear Creek lies within the "A" hydrologic soil group. Type "A" soils have a high infiltration rate with low runoff potential when thoroughly wet and have a high rate of water transmission (U.S. Department of Agriculture 1986). This description fits with knowledge that most recharge to the Barton Springs Segment of the Edwards Aquifer occurs in major creek channels.

Speck and Rumple-Comfort association soils are contained within the "C" hydrologic soil group. Type "C" soils have a low infiltration rate when thoroughly wet and generally impede downward movement of water (U.S. Department of Agriculture 1986). Thus, nearly all of the Edwards Aquifer recharge zone in the SH 45SW ROW, including all of the Flint Ridge Cave drainage area, is covered by soils that impede downward movement of water.

The Speck and Rumple-Comfort soils are of particular interest because of their unusual thickness and association with Pleistocene terra rossa soils known from central Texas. Terra rossa deposits are clay-rich paleosols formed from in-situ weathering of limestone units during long periods of wet climatic conditions such as those that are known to have occurred in central Texas during the glacial periods of the Pleistocene and earlier (Young 1986). Young (1986) defines terras rossas as "diagenetically altered paleosols that formed on limestone terrains under humid and tropical or nearly tropical, climatic regimes of approximately 1500 mm or more of rainfall per year."

The SH 45SW ROW is located within an outcrop of terra rossa that straddles the Hays/Travis county line as mapped by Young (1986). Within terra rossa outcrops the typical characteristics of the Edwards Aquifer recharge zone are not present. Whereas soils on outcrop of the Edwards Group are typically thin to absent, contain abundant rock outcrops, and support scrubby live/oak-juniper vegetation (Young 1986), the terra rossa terrains have relatively deep heavy clay soils, few rock outcrops, and support vegetation including mesquite (*Prosopis glandulosa*) trees which are typically common on clayey soils developed over geology such as the Del Rio Clay, but are usually rare within the recharge zone.[4]

Excavation activities performed as part of the karst investigation indicate that the terra rossa varies between 6 inches and 4 feet thick with typical thickness averaging about 2 feet (SWCA and Cambrian Environmental 2014a). A number of karst features were found to contain more than 10 feet of terra rossa. The presence of terra rossa undoubtedly results in the soil layer trapping a greater percentage of precipitation than expected in the recharge zone on average, with the result being a greater than expected loss of water to evapotranspiration. This helps explain why the amount of

[4] Terra rossa soils are globally associated with grape production and wineries. Most of the wineries in Texas are located on terra rossa soils in the Llano uplift area of the Edwards Plateau.

recharge to the aquifer via Flint Ridge Cave as measured by Hauwert et al. (2005) during a wet year was considerably less than the amount expected based solely on drainage basin area and annual rainfall as corrected for loss to evapotranspiration based on national-scale modeling.

The 2005 soil study by Wilding included study of soils at Headquarter Flat Sink Cave (HFSC), which is located northeast of the Project Area at the Ladybird Johnson Wildflower Center (Wilding 2005). The findings of those studies can be summarized as follows:

- Soil diversity is greater than illustrated on existing NRCS soil maps;
- Soil properties serve as strong buffers to aquifer contamination;
- High clay contents serve as a significant buffer to aquifer recharge;
- Major pathways of water movement exist along roots and rocks, but preferential flow is less than earlier anticipated using brilliant blue dye;
- Limited water flow through subjacent limestone occurs because of clay-plugged macrovoids and fissures;
- Due to increased impervious cover, enhanced surface runoff is likely to be a major construction impact;
- Overland flow of surface water is most critical when soils are very moist to saturated;
- A higher percentage of soils at HFSC are shallower than at Flint Ridge Cave;
- Soil texture, clay content, and stone content at the two sites are similar;
- Infiltration rates (not the same as aquifer recharge) are expected to be higher at Flint Ridge Cave than HFSC because soil depths are greater at Flint Ridge Cave; and
- It is expected that water runoff from soils at the HFSC site would be greater than at the Flint Ridge Cave site.

2.3 VEGETATION

The SH 45SW ROW lies within the Balcones Canyonlands Level IV ecoregion, which is a sub-division of the Edwards Plateau Level III ecoregion (Griffith et al. 2007). The Edwards Plateau as a whole consists of a dissected limestone plateau typified by rolling to hilly topography, shallow rocky soils, and woodlands dominated by Ashe juniper (*Juniperus ashei*), plateau live oak (*Quercus fusiformis*), and mesquite that is subject to periodic drought, and can alternatingly be exposed to dry winds from the west and moist air from the Gulf of Mexico (Griffith et al. 2007). The Balcones Canyonlands ecoregion is typified by rugged topography, where stream action working along the Balcones Escarpment on the southern and eastern margins of the Edwards Plateau has created a highly dissected landscape of steep-sided hills and canyons. A comparative abundance of flowing water distinguishes the Balcones Canyonlands from the remainder of the

Edwards Plateau (Griffith et al. 2007). While located within the Balcones Canyonlands ecoregion, topography of land in and adjacent to the SH 45SW ROW is for the most part relatively flat to gently rolling.

Vegetation within the SH 45SW ROW consists of a combination of open rangeland and woodland with varying degrees of canopy closure. The southern-most mile of the ROW crosses through a landscape that overall is much more open than that to the north, with this open landscape reflecting the distribution of exposure of fluviatile terrace deposits. These loose alluvial deposits form deeper soils that are more suited to agricultural uses than the shallow, rocky soils formed over the Edwards Formation. Where underlain by the fluviatile terrace deposits, lands crossed by the SH 45SW ROW consist of pastures and open, sometimes scrubby, woodlands. In general, lands crossed by the SH 45SW ROW where underlain by the Edwards Formation support semi-open to closed woodland composed primarily of Ashe juniper, plateau live oak, and mesquite trees, along with grassland and some light scrub.

2.3.1 Texas Ecological Systems Classification

The TPWD with cooperation from private, state, and federal partners, is producing a land classification system for the state under the Texas Ecological Systems Classification Project that it refers to as the Ecological Mapping Systems of Texas (EMST). A result of this project is relatively fine-scale mapping of land cover derived from a model based on remote sensing and interpretation of aerial imagery taken in 2004–2006 and 1996, and that took into account environmental data such as soils, topographic slope, stream center lines, and transportation center lines (Diamond and Elliott undated). The EMST mapping identifies 13 types of land cover as occurring within the SH 45SW ROW. Each of these land cover types is described in Table 2. The distribution of land cover in the SH 45SW ROW as mapped by the EMST is depicted in Figure 2.

As mapped by the EMST, Edwards Plateau Deciduous Oak / Evergreen Motte and Woodland is the dominant land cover in the SH 45SW ROW, covering approximately 58.9% of the area. Contrary to the unit description, as described in Section 2.4.2, this cover type in the SH 45SW ROW does not contain many, if any, Texas oak (*Quercus buckleyi*) or shin oak (*Quercus sinuata*) trees. Approximately 91.8% of the ROW is covered by the four most abundant cover types as mapped by the EMST.

While the EMST provides a relatively fine-scale mapping of land cover, the mapping in some cases is inaccurate or is too finely scaled and to us does not make ecological sense. For example, the only Central Texas Floodplain Hardwood Forest mapped within the SH 45SW ROW encompasses approximately 0.07 acre and represents about two of the trees present in woodland in the Bear Creek corridor that otherwise is mapped as Edwards Plateau Floodplain Hardwood / Ashe Juniper Forest. As another example, the only Edwards Plateau Ashe Juniper / Live Oak Shrubland mapped as occurring within the SH 45SW ROW is in reality part of a grassy pasture adjacent to FM 1626.

Table 2. Land Cover of the SH 45SW ROW as Mapped by the Ecological Mapping Systems of Texas.[1]

Land Cover Type	Acreage in ROW	Description
Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland	105.89	Variable across mapped range; typically contains Texas oak and/or shin oak mixed with Ashe juniper, plateau live oak, cedar elm (*Ulmus crassifolia*), or Texas sugarberry (*Celtis laevigata*) trees. Shrubs present may include Texas persimmon (*Diospyros texana*), agarita (*Mahonia trifoliolata*), and Texas mountain laurel (*Sophora secundiflora*).
Edwards Plateau: Savanna Grassland	28.90	Grassland with scattered trees and shrubs; grasses present may include KR bluestem (*Bothriochloa ischaemum*), Bermuda grass (*Cynodon dactylon*), little bluestem (*Schizachyrium scoparium*), silver bluestem (*Bothriochloa laguroides*), Texas wintergrass (*Nasella leucotricha*), purple three-awn (*Aristida purpurea*), and curlymesquite (*Hilaria belangeri*); trees and shrubs often present include plateau live oak, Ashe juniper, mesquite, agarita, and cedar elm.
Edwards Plateau: Live Oak Motte and Woodland	18.52	Evergreen woodland dominated by plateau live oak, with Ashe juniper frequently present; other species that may be present include Texas oak, shin oak, and post oak (*Quercus stellata*).
Edwards Plateau: Post Oak Motte and Woodland	11.69	Mainly deciduous woodland composed mostly of post oak and plateau live oak, with cedar elm, blackjack oak (*Quercus marilandica*), Texas oak, Texas sugarberry, and Ashe juniper often present.
Native Invasive: Mesquite Shrubland	5.40	Mesquite-dominated communities of various structure; mesquite may be mixed with plateau live oak, Ashe juniper, Texas sugarberry, netleaf hackberry, cedar elm, Texas persimmon, agarita, and lotebush (*Zizyphus obtusifolia*).
Urban Low Intensity	4.14	Developed areas not entirely covered by impervious cover.
Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest	3.60	Ashe juniper mixed with hardwood trees such as cedar elm, plateau live oak, pecan (*Carya illinoinensis*), American elm (*Ulmus americana*), Texas sugarberry, bur oak (*Quercus macrocarpa*), and sycamore (*Platanus occidentalis*).
Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest	1.06	Mixed forest usually dominated by Ashe juniper and plateau live oak, with cedar elm, sycamore, green ash (*Fraxinus pennsylvanica*), and Texas sugarberry trees usually also common.
Edwards Plateau: Ashe Juniper Motte and Woodland	0.22	Evergreen woodland usually dominated by Ashe juniper and live oak; sometimes pure stands of Ashe juniper; shin oak, Texas persimmon, and agarita shrubs may be common in understory.
Native Invasive: Deciduous Woodland	0.09	Woody vegetation of varying structure, usually composed of Texas sugarberry, cedar elm, and mesquite, sometimes with Ashe juniper, post oak, or plateau live oak.
Edwards Plateau: Oak / Ashe Juniper Slope Forest	0.07	Ashe juniper mixed with Texas oak and shin oak trees, sometimes with cedar elm, netleaf hackberry (*Celtis reticulata*), escarpment black cherry (*Prunus serotina* var. *eximia*), and Arizona walnut (*Juglans major*); understory species may include red buckeye (*Aesculus pavia*), Texas redbud (*Cercis canadensis*), and roughleaf dogwood (*Cornus drummondii*).
Central Texas: Floodplain Hardwood Forest	0.07	Deciduous trees such as pecan, white ash (*Fraxinus americana*), cedar elm, American elm, Texas sugarberry, willows, and eastern cottonwood (*Populus deltoides*).
Edwards Plateau: Ashe Juniper / Live Oak Shrubland	0.03	Evergreen shrubland usually occurring on moderate slopes and typically dominated by Ashe juniper and live oak, with shin oak, mountain laurel and evergreen sumac (*Rhus virens*) sometimes present.
Total	**179.68**	

[1]Land cover descriptions from Diamond and Elliott (undated).

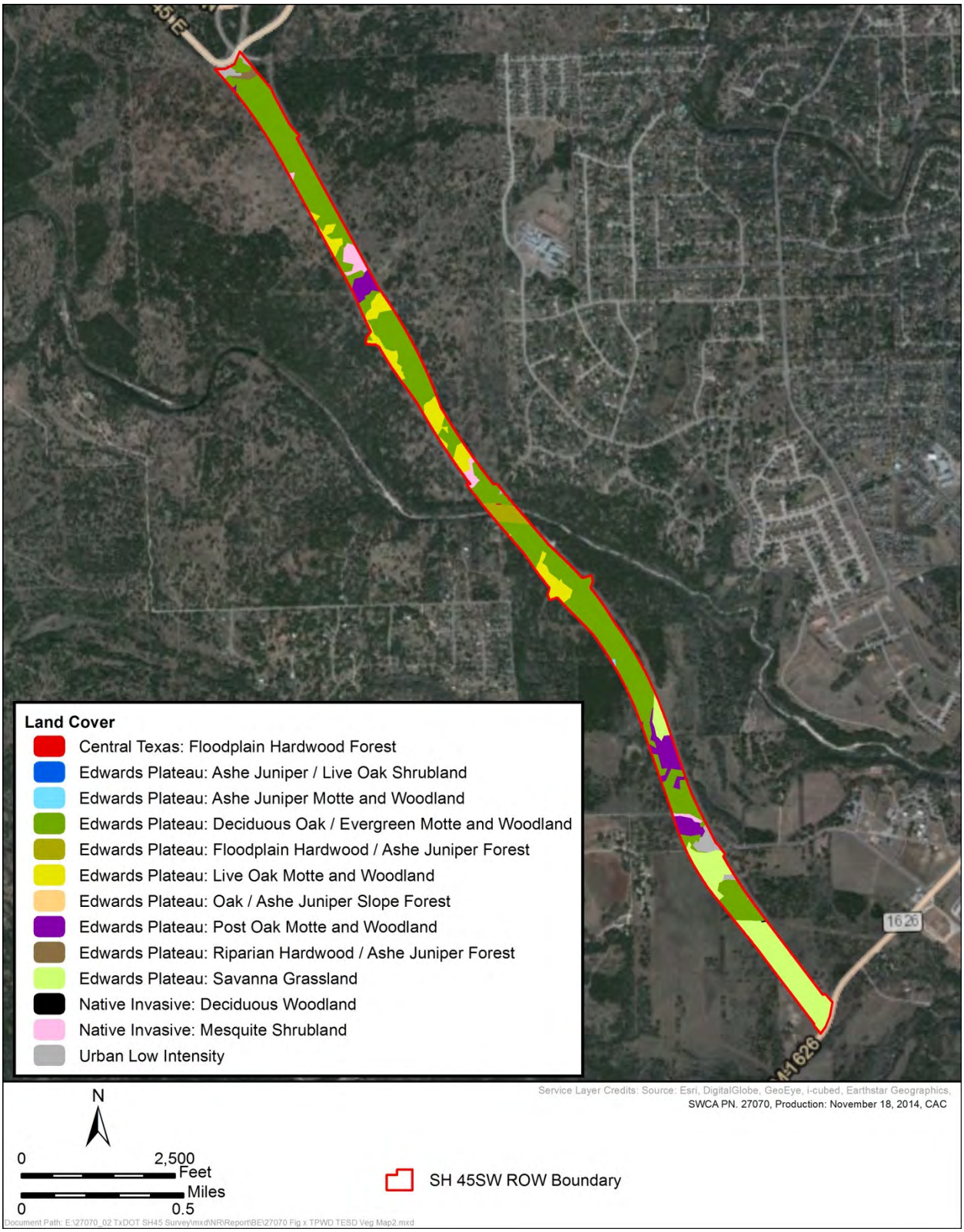

Figure 2. Land cover within the SH 45SW ROW as mapped by the EMST.

2.3.2 SWCA Vegetation Mapping

To address the limitations posed by the EMST land cover mapping, SWCA Environmental Consultants (SWCA) mapped land cover in the SH 45SW ROW based on observations made while performing fieldwork in the ROW and through review of 2011 digital aerial photography. Mapping using the digital aerial photography was mostly performed at a scale of 1:1,000. This mapping resulted in the identification of 14 land cover types in the SH 45SW ROW. These land cover types are described in Table 3 and their distribution in the ROW is depicted in Figure 3.

The Semi-Open Oak-Juniper Woodland, Open Juniper-Oak-Mesquite Woodland, and Juniper-Oak Woodland communities mapped by SWCA generally correspond to the Edwards Plateau Deciduous Oak / Evergreen Motte and Woodland cover type mapped by the EMST. The three communities mapped by SWCA differ primarily in degree of canopy closure, with mesquite occurring rarely in the more closed and shaded Juniper-Oak Woodland. These three communities were mapped by SWCA as covering approximately 92.24 acres (51.3%) of the ROW, compared to the 105.89 acres of Edwards Plateau Deciduous Oak / Evergreen Motte and Woodland mapped by the EMST. The latter is mapped by the EMST as covering a greater area because the unit contains some grassland mapped as Herbaceous by SWCA and a stand of plateau live oak trees that was separated out by SWCA as Hardwood Woodland.

Table 3. Land Cover of the SH 45SW ROW as Mapped by SWCA.

Land Cover Type	Acreage in ROW	Description
Semi-Open Oak-Juniper Woodland	43.60	Broken canopy, upland woodland composed mostly of Ashe juniper and plateau live oak trees, with low to moderately low densities of mesquite and cedar elm trees, low to very low densities of post oak and blackjack oak (*Quercus marilandica*) trees, and an occasional China-berry tree (*Melia azederach*). Texas persimmon, agarita, elbowbush (*Forestiera pubescens*), gum elastic (*Sideroxylon lanuginosum*), and prickly pear (*Opuntia* spp.) present as understory shrubs.
Open Oak-Juniper-Mesquite Woodland	33.75	Open canopy woodland composed mostly of plateau live oak, Ashe juniper, and mesquite trees, with cedar elm and post oak trees present locally in low to very low densities. Well-developed herbaceous cover in clearings between trees; clearings with prickly pear and low densities of shrubs, including Texas persimmon, agarita, elbowbush, and gum elastic.
Herbaceous	23.70	Grassland, pastures, grassy roadside rights-of-way, and a transmission line easement. Grasses present include Texas wintergrass, purple three-awn, KR bluestem, little bluestem, and Texas grama (*Bouteloua rigidiseta*). Grassland with various forbs, prickly pear (*Opuntia* spp.), and very low densities of shrubs, mostly Texas persimmon and agarita. The transmission line easement in places contains low patches of root-sprouting plateau live oak.

Table 3. Land Cover of the SH 45SW ROW as Mapped by SWCA.

Land Cover Type	Acreage in ROW	Description
Mixed Juniper-Hardwood Woodland	18.27	Closed to nearly closed canopy woodland dominated by Ashe juniper but containing a variety of hardwood trees, including plateau live oak, cedar elm, Texas oak, and Texas sugarberry. Included in this unit is riparian woodland along Bear Creek. Trees present along Bear Creek include Texas oak, sycamore (*Platanus occidentalis*), cedar elm, Texas ash, Ashe juniper, Carolina buckthorn (*Frangula caroliniana*), and pecan (*Carya illinoinensis*). Shrubs present along the creek include common hop-tree (*Ptelea trifoliata*), American beautyberry (*Callicarpa americana*), buttonbush (*Cephalanthus occidentalis*), and gum elastic. Slopes leading down to the creek support live oak/Ashe juniper woodland. Overall shrub density is low to moderate on these slopes, although shrub diversity is comparatively high. Shrub species present on the slopes include red buckeye, Mexican buckeye (*Ungnadia speciosa*), fragrant sumac (*Rhus aromatica*), poison-ivy (*Toxicodendron radicans*), agarita, common hop-tree, Texas kidneywood (*Eysenhardtia texana*), shrubby boneset (*Eupatorium serotinum*), Texas persimmon, elbowbush, prickly pear, and twistleaf yucca (*Yucca rupicola*).
Hardwood Woodland	16.98	Stands of upland woodland with canopy provided only by hardwood trees. The stand south of Bliss Spillar Road is composed of plateau live oak trees with an understory of Ashe juniper and cedar elm saplings and elbowbush and Texas persimmon shrubs. The stand between Bear Creek and Bliss Spillar Road is composed of large plateau live oak and cedar elm trees, with a shrubby understory of Texas persimmon, agarita, elbowbush, Ashe juniper, cedar elm, and western soapberry (*Sapindus saponaria*) saplings, and grape (*Vitis* sp.) and green-brier (*Smilax bona-nox*) vines.
Invaded Pasture	16.28	Former pastures that have been invaded by woody species, mostly mesquite but also some plateau live oak and Ashe juniper.
Juniper-Oak Woodland	14.89	Closed or nearly closed canopy upland woodland composed mostly of Ashe juniper and plateau live oak trees. Cedar elm present locally in low to moderate densities; blackjack oak trees present locally in low to very low densities. Texas persimmon, agarita, and elbowbush present as understory shrubs.
Shrubby Live Oak Savanna	6.29	Apparent former live oak savanna, since invaded by woody species. Scattered large plateau live oak trees with smaller mesquite, cedar elm, Ashe juniper, and Texas sugarberry shrubs and saplings. Occurs between Bliss Spillar and Old Bliss Spillar roads – most of it erroneously mapped as Urban Low Intensity land cover by the EMST.
Ashe Juniper Savanna	2.26	Similar to grasslands mapped as Herbaceous, except with a light scatter of Ashe juniper trees.
Live Oak Savanna	1.81	Similar to grasslands mapped as Herbaceous, except with a light scatter of plateau live oak trees.
Roads and Structures	0.87	Paved segments of Bliss Spillar Road and Old Bliss Spillar Road, a stubbed-out connection where the ROW meets MoPac, and a concrete water quality pond near MoPac.
Rural Residential	0.65	Large residential lots with maintained yards and specimen trees.
Rocky Creek Channel	0.29	Nearly barren, scoured rocky bottom of Bear Creek.
Stock Pond	0.04	Open water contained in one artificial pond on the west edge of the ROW.
Total	**179.68**	

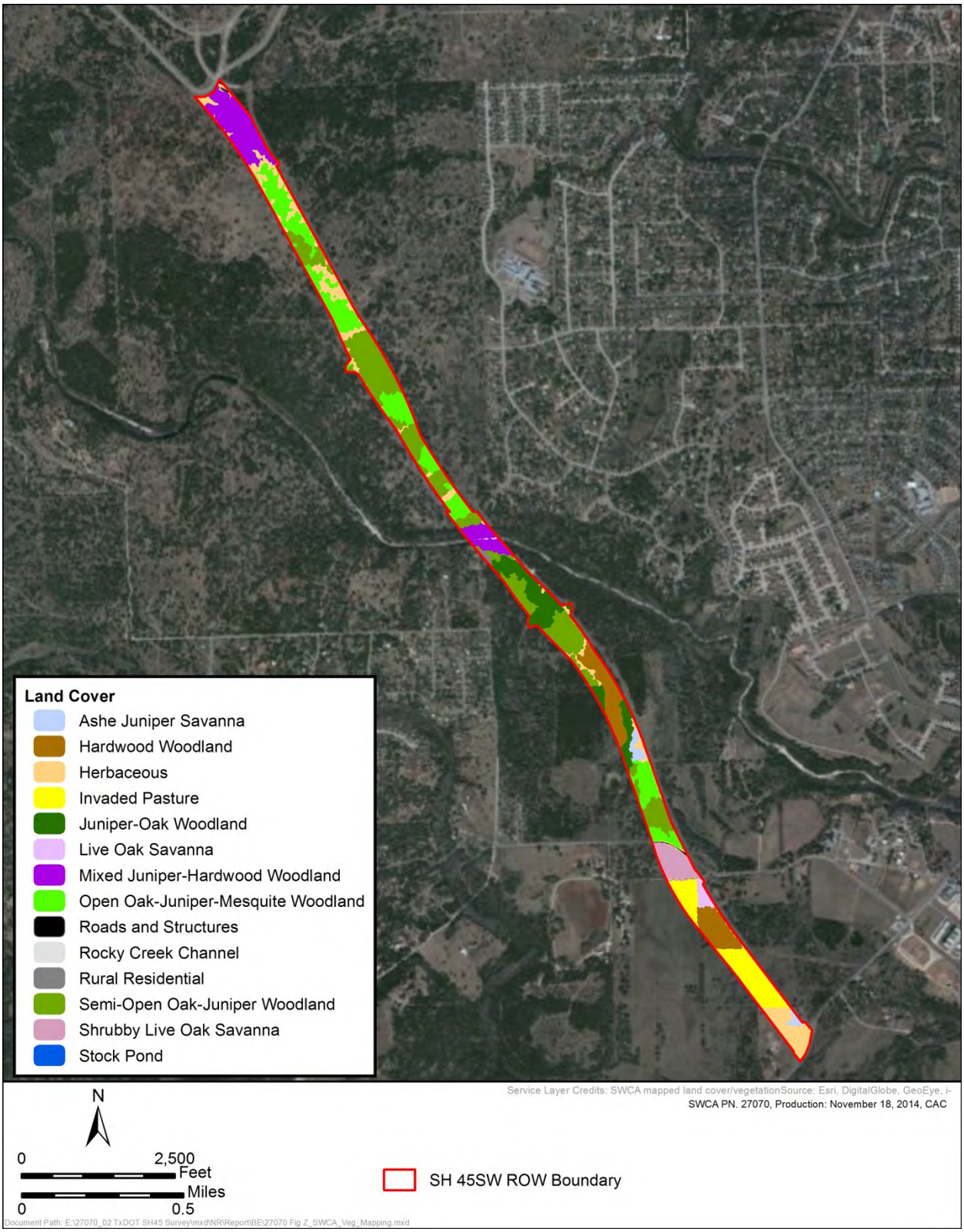

Figure 3. Land cover in the SH 45SW ROW as mapped by SWCA.

2.3.3 Oak Wilt

Oak trees in woodlands of the Edwards Plateau are susceptible to a disease known as oak wilt, which is caused by a fungus (*Ceratocystis fagacearum*) that can kill oak trees by disabling their water-transmission system. To minimize the potential for its activities to enable damage from oak wilt, TxDOT follows Texas Forest Service protocols to prevent the spread of the disease.

Oaks of the red oak group are especially susceptible to oak wilt (TexasOakWilt.org 2012a). Species of the red oak group present in woodlands within the SH 45SW ROW include Texas oak and blackjack oak. These trees are generally rare to uncommon, respectively. Oaks of the white oak group show some tolerance of the fungus (TexasOakWilt.org 2012a). Post oak is a member of the white oak group and is generally uncommon but widespread in uplands of the SH 45SW ROW. Shin oak is also a member of the white oak group; this species is rare to absent across the ROW. Plateau live oak, which is the most commonly occurring species of oak in the SH 45SW ROW, is moderately susceptible to oak wilt, but is also typically the most commonly affected because the fungus transmits readily from tree to tree via shared root systems (TexasOakWilt.org 2012a). The fungus that causes oak wilt can also be spread from tree to tree by contaminated tree-cutting equipment or by sap-feeding beetles, which can carry fungal spores from contaminated trees to healthy trees. Healthy trees can only be contaminated if their protective bark has been freshly breached, such as can occur from a limb being cut off or breaking.

Because oak wilt can spread among live oaks from tree to tree via the root system, the disease can often be seen to spread concentrically outward from an initially infected tree. Such concentrations of trees are referred to as centers. A center typically consists of a ring of diseased and dying trees surrounding those that have already died. No oak wilt centers are known to occur within the SH 45SW ROW. A large oak wilt center is known to occur on City of Austin land to the east of the ROW (Li and Spillar 2014).

2.4 WILDLIFE

Surveys for two federally endangered songbirds, the golden-cheeked warbler (*Setophaga chrysoparia*) and black-capped vireo (*Vireo atricapilla*), were conducted in the SH 45SW ROW in the spring of 2014 by SWCA. To our knowledge, no other species-specific wildlife surveys have been conducted in the Project Area. Incidental observations of wildlife were made by SWCA while conducting the 2014 warbler/vireo survey and while excavating karst features as described in Section 2.1.2. In general, the types of vegetation communities present in the SH 45SW ROW are common and widespread in central Texas, so wildlife in the Project Area is expected to be comprised primarily of common wildlife species typical of juniper/oak woodlands of the Edwards Plateau.

Tables 4 – 6 identify species of birds, mammals, and amphibians/reptiles that are known to occur, or may occur regularly, in the SH 45SW ROW. Common names of birds identified in Table 4 are as standardized by the American Ornithologists' Union

(1998). The list of birds in Table 4 is limited to those species expected to be permanent or seasonal residents of the ROW. Birds identified as breeding-season residents may be present in the ROW from spring through late summer or early fall, depending on species. Winter-resident birds may be present in the ROW from fall through spring. Bird species expected to occur in the ROW only as migrants are not included in Table 4 because the list of possibly occurring migrants is extremely long, as it would be for any locality in central Texas. Species known to occur in the SH 45SW ROW are identified in the tables in bold-faced type. Species known to occur in the ROW are based on observations made by SWCA while conducting the 2014 field investigations unless otherwise noted.

Fish are absent from the SH 45SW ROW under typical conditions owing to a lack of permanent water excluding one small stock pond. Segments of Bear Creek up-gradient of the ROW on City of Austin lands appear to hold water on a permanent or near-permanent basis and are known to support fish (P. Sunby/SWCA pers. obs.). For this reason, Bear Creek during flood stage has potential to carry fish downstream into the ROW. During one field visit to the ROW following a heavy rainfall event, a few very small largemouth bass (*Micropterus salmoides*) and small sunfish (*Lepomis* spp.) were observed trapped in a drying pool in the Bear Creek channel within the ROW (K. White/Cambrian Environmental, pers. obs.).

Table 4. Birds Known and Expected to Occur in the SH 45SW ROW (birds known to occur shown in bold-faced type)[1]

Common Name	Status[2]	Common Name	Status
Black-bellied whistling-duck	P	**Black-crested titmouse**	**P**
Northern bobwhite	**P**	**Verdin**	**P**
Wild turkey	**P**	Red-breasted nuthatch	W
Great blue heron[3]	**P**	**House wren**	**W**
Great egret[3]	**P**	Winter wren	W
Green heron[3]	B	**Carolina wren**	**W**
Black vulture	**P**	**Bewick's wren**	**W**
Turkey vulture	**P**	**Blue-gray gnatcatcher**	**B**
Sharp-shinned hawk	W	Golden-crowned kinglet	W
Cooper's hawk	**P**	**Ruby-crowned kinglet**	**W**
Red-shouldered hawk	**P**	Eastern bluebird	P
Red-tailed hawk	**P**	Hermit thrush	W
Rock pigeon	P	American robin	W
Eurasian collared-dove	P	Brown thrasher	W
White-winged dove	**P**	**Northern mockingbird**	**P**
Mourning dove	**P**	**European starling**	**P**
Common ground-dove	**P**	**Cedar waxwing**	**W**
Yellow-billed cuckoo	**B**	Black-and-white warbler	B
Greater roadrunner	**P**	Orange-crowned warbler	W
Barn owl	P	Common yellowthroat	W
Eastern screech-owl	P	Yellow-rumped warbler	W

Table 4. Birds Known and Expected to Occur in the SH 45SW ROW (birds known to occur shown in bold-faced type)[1]

Common Name	Status[2]	Common Name	Status
Great horned owl	**P**	**Spotted towhee**	**W**
Barred owl	P	Rufous-crowned sparrow	P
Common nighthawk	B	**Chipping sparrow**	**W**
Chuck-will's-widow	**B**	Field sparrow	P
Chimney swift	**B**	Vesper sparrow	W
Black-chinned hummingbird	**B**	**Lark sparrow**	**B**
Golden-fronted woodpecker	P	Savannah sparrow	W
Red-bellied woodpecker	**P**	**Grasshopper sparrow**	**W**
Yellow-bellied sapsucker	W	Fox sparrow	W
Ladder-backed woodpecker	**P**	Song sparrow	W
Northern flicker	W	Lincoln's sparrow	W
Crested caracara	**P**	White-throated sparrow	W
American kestrel	W	White-crowned sparrow	W
Eastern wood-pewee	B	Dark-eyed junco	W
Eastern phoebe	**P**	**Summer tanager**	**B**
Ash-throated flycatcher	B	**Northern cardinal**	**P**
Great crested flycatcher	**B**	Blue grosbeak	B
Western kingbird	**B**	Indigo bunting	B
Scissor-tailed flycatcher	**B**	**Painted bunting**	**B**
Loggerhead shrike	P	**Dickcissel**	**B**
White-eyed vireo	**B**	Red-winged blackbird	P
Blue-headed vireo	**W**	**Common grackle**	**P**
Blue jay	**P**	**Great-tailed grackle**	**P**
Western scrub-jay	**P**	**Brown-headed cowbird**	**B**
American crow	**P**	Orchard oriole	B
Common raven	**P**	**House finch**	**P**
Purple martin	**B**	Pine siskin	W
Cliff swallow	**B**	**Lesser goldfinch**	**B**
Cave swallow	B	American goldfinch	W
Barn swallow	B	House sparrow	P
Carolina chickadee	**P**		

[1] Birds known to occur in the ROW based on observations made by SWCA. Birds expected to occur based on Lockwood and Freeman (2014) and types of vegetation communities present in ROW.

[2] B = breeding season resident; P = permanent resident (abundance of some species reduced in winter); W = winter season resident

[3] All herons and egrets expected to occur primarily as fly-overs. Green herons could occur along Bear Creek when it is holding water.

Table 5. Mammals that are Known To or May Occur in the SH 45SW ROW (mammals known to occur shown in bold-faced type)[1]

Common Name	Scientific Name	Regional Status / Comments[2]
Virginia opossum	*Didelphis virginiana*	A
Nine-banded armadillo	*Dasypus novemcinctus*	C
Least shrew	*Cryptotus parva*	U
Cave myotis	***Myotis velifer***	C - known to occur adjacent to the ROW in Flint Ridge Cave (Elliott 1997). It is assumed that some individual bats forage over the SH 45SW ROW.
Eastern red bat	*Lasiurus borealis*	C
Hoary bat	*Lasiurus cinereus*	R - Spring/fall migrant only
Silver-haired bat	*Lasionycteris noctivagans*	P - Spring/fall migrant only
Tri-colored bat	***Perimyotis subflavus***	U-A – known to occur adjacent to the ROW in Flint Ridge Cave (Travis County and City of Austin 2012). It is assumed that some individual bats forage over the SH 45SW ROW
Evening bat	*Nycticeius humeralis*	U-C
Brazilian free-tailed bat	*Tadarida brasiliensis*	A
Coyote	***Canis latrans***	U
Common gray fox	*Urocyon cineroargenteus*	C
Ringtail	*Bassariscus astutus*	U-C
Common raccoon	*Procyon lotor*	A
Eastern (Plains) spotted skunk	*Spilogale putorius*	R - See discussion in Section 2.5.2
Striped skunk	*Mephitis mephitis*	A
Bobcat	***Lynx rufus***	U
Feral pig	***Sus scrofa***	n/a
Axis deer	*Cervus axis*	C
White-tailed deer	***Odocoileus virginianus***	A
Rock squirrel	*Spermophilus variegatus*	C
Eastern fox squirrel	***Sciurus niger***	A
Merriam's pocket mouse	*Perognathus merriami*	U
Hispid pocket mouse	*Chaetodipus hispidus*	A
Fulvous harvest mouse	*Reithrodontomys fulvescens*	A
Plains harvest mouse	*Reithrodontomys montanus*	C
Texas mouse	*Peromyscus attwateri*	U-C
White-footed mouse	*Peromyscus leucopus*	C-A
Deer mouse	*Peromyscus maniculatus*	C
White-ankled mouse	*Peromyscus pectoralis*	C
Northern pygmy mouse	*Baiomys taylori*	U-C
Hispid cotton rat	*Sigmodon hispidus*	A
Eastern woodrat	*Neotoma floridanus*	R
Black rat	*Rattus rattus*	A
House mouse	*Mus musculus*	A
North American porcupine	***Erethizon dorsatum***	R[3]

Table 5. Mammals that are Known To or May Occur in the SH 45SW ROW (mammals known to occur shown in bold-faced type)[1]

Common Name	Scientific Name	Regional Status / Comments[2]
Eastern cottontail	***Sylvilagus floridanus***	A
Black-tailed jackrabbit	*Lepus californicus*	C-A

[1]Mammals known to occur in the ROW based on observations made by SWCA. Mammals expected to occur based on Schmidly (2004) and Kutac and Caran (1994).

[2] Regional status based on Kutac and Caran (1994). A = abundant; C = common; U = uncommon; R = rare; P = possible

[3] Porcupine population noted as increasing and spreading eastward (Kutac and Caran 1994). Likely no longer rare in Travis and Hays counties.

Table 6. Amphibians and Reptiles that are Known To or May Occur in the SH 45SW ROW (species known to occur shown in bold-faced type)[1]

Common Name	Scientific Name	Regional Status[2]
Western slimy salamander	***Plethodon albagula***	C
Couch's spadefoot	*Scaphiopus couchii*	C
Cliff chirping frog	***Eleutherodactylus marnockii***	C
Blanchard's cricket frog	*Acris blanchardi*	A
Cope's gray treefrog	*Hyla chrysoscelis*	C
Green treefrog	*Hyla cinerea*	C
Gray treefrog	*Hyla versicolor*	C
Strecker's chorus frog	*Pseudacris streckeri*	C
Green toad	*Anaxyrus debilis*	C
Gulf coast toad	***Incilius nebulifer***	A
Red-spotted toad	*Anaxyrus punctatus*	C
Texas toad	*Anaxyrus speciosus*	C
Woodhouse's toad	*Anaxyrus woodhousii*	U
Rio Grande leopard frog	***Lithobates berlandieri***	A
Western narrow-mouthed toad	*Gastrophryne olivacea*	C
Eastern snapping turtle	*Chelydra serpentina*	C
Yellow mud turtle	*Kinosternon flavescens*	C
Eastern musk turtle	*Sternotherus odoratus*	C-A
Ornate box turtle	*Terrapene ornata*	C
Pond (red-eared) slider	*Trachemys scripta*	A
Eastern collared lizard	*Crotaphytus collaris*	C
Texas greater earless lizard	*Cophosaurus texanus texanus*	C
Prairie lizard	*Sceloporus consobrinus*	C
Texas spiny lizard	*Sceloporus olivaceus*	A
Texas tree lizard	*Urosaurus ornatus ornatus*	C
Green anole	*Anolis carolinensis*	A
Great Plains skink	*Plestiodon obsoletus*	U
Short-lined skink	*Plestiodon tetragrammus brevilineatus*	C

Table 6. Amphibians and Reptiles that are Known To or May Occur in the SH 45SW ROW (species known to occur shown in bold-faced type)[1]

Common Name	Scientific Name	Regional Status[2]
Little brown skink	*Scincella lateralis*	A
Common spotted whiptail	*Aspidoscelis gularis*	C
Six-lined racerunner	*Cnemidophorus sexlineatus sexlineatus*	C
Texas alligator lizard	*Gerrhonotus infernalis*	U
Texas threadsnake	*Rena dulcis*	C
Eastern yellow-bellied racer	*Coluber constrictor flaviventris*	C
Prairie ring-necked snake	*Diadophis punctatus arnyi*	R-U
Great Plains ratsnake	*Pantherophis emoryi*	C
Texas ratsnake	*Pantherophis obsoleta*	C
Eastern hog-nosed snake	*Heterodon platirhinos*	C
Chihuahuan nightsnake	*Hypsiglena jani*	C
Common kingsnake	*Lampropeltis getula*	U
Western coachwhip	***Coluber flagellum testaceus***	C
Striped whipsnake	*Coluber taeniatus*	U
Rough greensnake	***Opheodrys aestivus***	C
Bullsnake	*Pituophis catenifer*	C
Long-nosed snake	*Rhinocheilus lecontei*	U
Texas patch-nosed snake	***Salvadora grahamiae lineata***	U-C
Western groundsnake	*Sonora semiannulata*	C
Dekay's brownsnake	*Storeria dekayi*	C
Flat-headed snake	*Tantilla gracilis*	U-C
Plains black-headed snake	*Tantilla nigriceps*	U
Black-necked gartersnake	*Thamnophis cyrtopsis*	C
Checkered gartersnake	*Thamnophis marcianus*	C
Western ribbonsnake	*Thamnophis proximus*	U
Texas lined snake	*Tropidoclonion lineatum texanum*	C
Rough earthsnake	*Virginia striatula*	C
Texas coralsnake	*Micrurus tener*	C
Broad-banded copperhead	*Agkistrodon contortrix laticinctus*	C
Western diamond-backed rattlesnake	***Crotalus atrox***	C

[1]Amphibians and reptiles known to occur in the ROW based on observations made by SWCA. Amphibians/reptiles expected to occur based on Kutac and Caran (1994).

[2] Regional status based on Kutac and Caran. A = abundant; C = common; U = uncommon; R = rare

2.5 THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

The USFWS and TPWD maintain county-by-county lists of threatened and endangered species. Included on the USFWS lists are species the agency has proposed to list, or has designated as candidates for listing, as threatened or endangered. The TPWD

includes on its lists both federally and state-listed species (including species that historically occurred in the state but have since been extirpated) as well as non-listed species of concern. In general, species of concern are those considered to be imperiled, declining, or vulnerable, those existing in fragmented or isolated populations, those with needs not being met by current TPWD funding sources, or those of economic importance to the State of Texas (TPWD 2005). Species of concern are hereafter referred to as *Species of Greatest Conservation Need* (SGCN) to match how these species are referred to in the DEIS.

Some of the species that appear on the USFWS (2014a) and TPWD (2012, 2014) lists for Travis and Hays counties clearly do not have potential to occur in the Project Area or be adversely impacted by construction and use of SH 45SW. Those species are identified in Table 7 and are not reviewed further in this evaluation. Included in Table 7 is the rationale for the exclusion of each of these species from additional review in the biological evaluation.

Table 8 identifies species that occur on the USFWS (2014a) and TPWD (2012, 2014) lists for Travis and Hays counties whose potential to be adversely impacted by construction and use of SH 45SW cannot be so readily discounted as it is for those species identified in Table 7. A discussion of the potential for each of the species identified in Table 8 to occur in the Project Area and their ability to be adversely impacted by activities occurring in the Project Area is provided below. The potential for construction and use of SH 45SW to adversely impact three of the federally listed species identified in Table 8 (Austin blind salamander, Barton Springs salamander, and golden-cheeked warbler) is examined in greater depth in Section 4.0 (Potential Effects).

2.5.1 Birds

Bald eagle is a very large bird of prey that is increasing in numbers in Texas (Ortego et al. 2009). It is considered an uncommon resident of the region from mid-November through mid-March and occurs rarely in the region from early March through early November (Travis Audubon Society 2003). Ortego et al. (2009) report three bald eagle nests as having occurred in Travis County during the period of 1970-2009 and none in Hays County during that same period. Bald eagles typically nest in large trees in association with large aquatic systems and are usually found near reservoirs or along river courses (Campbell 2003). All nests known from Travis County have been in the Colorado River corridor downstream of Lake Lady Bird (B. Ortego/TPWD pers. comm. to SWCA on 17 October 2014).

The proposed SH45SW corridor bisects an ephemeral tributary of the Colorado River, Bear Creek. This usually dry drainage course does not provide suitable habitat for utilization by bald eagles, nor do the upland vegetation communities within the ROW. Individual bald eagles may occasionally fly over the SH 45SW ROW during migration, but because the ROW does not offer the type of habitat typically used by bald eagles for hunting, eagles migrating over corridor should be flying at comparatively great height. Consequently, no adverse impacts to bald eagle are expected from the construction and operation of SH 45SW.

Table 7. Species Appearing on USFWS and TPWD Lists of Threatened, Endangered, and Rare Species for Travis and Hays Counties Not Reviewed in the SH 45SW Biological Evaluation.

Common Name	*Scientific Name*	Status[1]		Rationale for Exclusion from Review
		Federal	State	
Birds				
Interior least tern	*Sterna antillarum*	E	E	An aquatic species that occurs in the region only as a migrant (Lockwood and Freeman 2014). No suitable habitat present.
Mountain plover	*Charadrius montanus*		SGCN	A species of open shortgrass prairie and agricultural fields (Lockwood and Freeman 2014, USFWS 2010a). No suitable habitat present.
Piping plover	*Charadrius melodus*	T	SGCN	A species tied to aquatic habitats such as mudflats and shorelines; occurs in the region only as a migrant (Lockwood and Freeman 2014). No suitable habitat present.
Mammals				
Red wolf	*Canis rufus*	E	E	Extirpated from the state (TPWD 2012).
Reptiles				
Cagle's map turtle	*Graptemys caglei*		T	Does not occur in the Colorado River watershed (Dixon 2013).
Amphibians				
Blanco blind salamander	*Eurycea robusta*		T	Restricted to the Blanco River drainage (Tipton et al. 2012).
Blanco River springs salamander	*Eurycea pterophila*		SGCN	Restricted to the Blanco River drainage (Tipton et al. 2012).
Jollyville Plateau salamander	*Eurycea tonkawae*	T	SGCN	Restricted to the Edwards Plateau north of the Colorado River (USFWS 2013).
Pedernales River springs salamander	*Eurycea* sp. 6		SGCN	Restricted to the western edge of Travis County, where it occurs at springs along the Pedernales River (Tipton et al. 2012).
San Marcos salamander	*Eurycea nana*	T	T	Restricted to San Marcos Springs in Hays County (Tipton et al. 2012), which is fed by San Antonio segment of the Edwards Aquifer.
Texas blind salamander	*Eurycea rathbuni*	E	E	Restricted to subterranean aquatic habitats of the San Antonio segment of the Edwards Aquifer (Tipton et al. 2012).
Fishes				
Fountain darter	*Etheostoma fonticola*	E	E	Does not occur in the Colorado River watershed (Thomas et al. 2007).
Guadalupe darter	*Percina sciera apristis*		SGCN	Does not occur in the Colorado River watershed (TPWD 2012).
Ironcolor shiner	*Notropis chalybaeus*		SGCN	Does not occur in the Colorado River watershed (Thomas et al. 2007).
San Marcos gambusia	*Gambusia georgei*	E	E	Extinct (TPWD 2012). Did not occur in Colorado River watershed.

Table 7. Species Appearing on USFWS and TPWD Lists of Threatened, Endangered, and Rare Species for Travis and Hays Counties Not Reviewed in the SH 45SW Biological Evaluation.

Common Name	*Scientific Name*	Status[1]		Rationale for Exclusion from Review
		Federal	State	
Arthropods				
A cave obligate crustacean	*Monodella texana*		SGCN	Known only from San Antonio segment of the Edwards Aquifer; has been collected in Bexar, Hays, and Uvalde counties (Stock and Longley 1981)).
Comal Springs dryopid beetle	*Stygoparnus comalensis*	E	E	Restricted to aquatic habitats of the San Antonio segment of the Edwards Aquifer (USFWS 2007a).
Comal Springs riffle beetle	*Heterelmis comalensis*	E	E	Restricted to aquatic habitats of the San Antonio segment of the Edwards Aquifer (USFWS 2007a).
Edward's Aquifer diving beetle	*Haideoporus texanus*		SGCN	Known range restricted to the San Antonio segment of the Edwards Aquifer (Bowles and Stanford 1997).
Ezell's cave amphipod	*Stygobromus flagellatus*		SGCN	Known range restricted to the San Antonio segment of the Edwards Aquifer (Holsinger and Longley 1980).
Flint's net-spinning caddisfly	*Cheumatopsyche flinti*		SGCN	Very poorly known species. Collected from one spring in Hays County; collection site now unknown (TPWD 2012). Location suggests it occurs outside of the Barton Springs Recharge Zone.
Kretschmarr Cave mold beetle	*Texamaurops reddelli*	E	SGCN	Restricted to caves north of the Colorado River (USFWS 1991).
San Marcos saddle-case caddisfly	*Protoptila arca*		SGCN	Restricted to the San Marcos River (Edwards and Arnold 1961).
Texas austrotinodes caddisfly	*Austrotinodes texensis*		SGCN	Restricted to permanent streams fed by spring flow from San Antonio segment of the Edwards Aquifer (Bowles 1995).
Texas cave shrimp	*Palaemonetes antrorum*		SGCN	Known only from subterranean aquatic habitats of the San Antonio segment of the Edwards Aquifer in San Marcos (Strenth 1976).
Texas troglobitic water slater	*Lirceolus smithii*		SGCN	Known only from subterranean aquatic habitats of the San Antonio segment of the Edwards Aquifer (Bowman and Longley 1976).
Tooth Cave pseudoscorpion	*Tartarocreagris texana*	E	SGCN	Restricted to caves north of the Colorado River (USFWS 1994).
Tooth Cave blind rove beetle	*Cylindropsis* sp. 1		SGCN	Known from one cave north of the Colorado River (TPWD 2014).

Table 7. Species Appearing on USFWS and TPWD Lists of Threatened, Endangered, and Rare Species for Travis and Hays Counties Not Reviewed in the SH 45SW Biological Evaluation.

Common Name	*Scientific Name*	Status[1]		Rationale for Exclusion from Review
		Federal	State	
Tooth Cave ground beetle	*Rhadine persephone*	E	SGCN	Restricted to caves north of the Colorado River (USFWS 1994).
Tooth Cave spider	*Neoleptoneta myopica*	E	SGCN	
Warton's cave meshweaver	*Cicurina wartoni*		SGCN	No longer considered a distinct species; no longer a federal candidate species. Restricted to caves north of the Colorado River (USFWS 2014b).
Mollusks				
Golden orb	*Quadrula aurea*	C	SGCN	No longer believed to occur in Colorado River watershed (USFWS 2011a).
Plants				
Basin bellflower	*Campanula reverchonii*		SGCN	Restricted to igneous-derived soils of Llano Uplift region (Poole et al. 2007). No suitable habitat present.
Texabama croton	*Croton alabamensis* var. *texensis*		SGCN	Enigmatic distribution; known in region only from highly dissected terrain in northwest Travis County (Pace Bend Park and Balcones National Wildlife Refuge); not known to occur in the state south of those locations (Poole et al. 2007); Travis County plants on substrates not derived from the Edwards Formation.
Texas wild-rice	*Zizania texana*	E	E	Does not occur in the Colorado River drainage (Poole et al. 2007).

[1] C = designated a federal candidate for listing as threatened or endangered; E = endangered; SGCN = non-listed species of greatest conservation need; T = threatened

Table 8. Threatened, Endangered, Candidate, and Rare Species Considered in the Biological Evaluation

Common Name	*Scientific Name*	Status[1]	
		Federal	State
Birds			
Bald eagle	*Haliaeetus leucocephalus*		T
Black-capped vireo	*Vireo atricapilla*	E	E
Burrowing owl	*Athene cunicularia hypugaea*		SGCN
Golden-cheeked warbler	*Setophaga chrysoparia*	E	E
Peregrine falcon	*Falco peregrinus*		T, SGCN
Sprague's pipit	*Anthus spragueii*	C	SGCN
Whooping crane	*Grus americana*	E	E
Zone-tailed hawk	*Buteo albonotaus*		T
Mammals			
Cave myotis	*Myotis velifer*		SGCN
Plains spotted skunk	*Spilogale putorius interrupta*		SGCN
Reptiles			
Spot-tailed earless lizard	*Holbrookia lacerata*		SGCN
Texas garter snake	*Thamnophis sirtalis annectens*		SGCN
Texas horned lizard	*Phrynosoma cornutum*		T
Amphibians			
Austin blind salamander	*Eurycea waterlooensis*	E	SGCN
Barton Springs salamander	*Eurycea sosorum*	E	E
Fishes			
Guadalupe bass	*Micropterus treculi*		SGCN
Smalleye shiner	*Notropis buccula*	E	SGCN
Arthropods			
A mayfly	*Procloeon distinctum*		SGCN
An amphipod	*Stygobromus russelli*		SGCN
Balcones Cave amphipod	*Stygobromus balconis*		SGCN
Bandit Cave spider	*Cicurina bandida*		SGCN
Bee Creek Cave harvestman	*Texella reddelli*	E	SGCN
Bifurcated cave amphipod	*Stygobromus bifurcatus*		SGCN
Bone Cave harvestman	*Texella reyesi*	E	SGCN
Leonora's dancer	*Argia leonorae*		SGCN
Rawson's metalmark	*Calephelis rawsoni*		SGCN
Mollusks			
Creeper	*Strophitus undulatus*		SGCN
False spike mussel	*Quadrula mitchelli*		T
Smooth pimpleback	*Quadrula houstonensis*	C	T
Texas fatmucket	*Lampsilis bracteata*	C	T
Texas fawnsfoot	*Truncilla macrodon*	C	T
Texas pimpleback	*Quadrula petrina*	C	T

Table 8. Threatened, Endangered, Candidate, and Rare Species Considered in the Biological Evaluation

Common Name	*Scientific Name*	Status[1]	
		Federal	State
Plants			
Boerne bean	*Phaseolus texensis*		SGCN
Bracted twistflower	*Streptanthus bracteatus*	C	SGCN
Correll's false dragon-head	*Physostegia correllii*		SGCN
Hill Country wild-mercury	*Argythamnia aphoroides*		SGCN
Warnock's coral-root	*Hexalectris warnockii*		SGCN

[1] C = designated a federal candidate for listing as threatened or endangered; E = endangered; SGCN = non-listed species of greatest conservation need; T = threatened

Black-capped vireo is a small migratory songbird that was federally listed as endangered in 1987 (USFWS 1991). In Texas, the species breeds primarily in the Cross Timbers, Edwards Plateau, and the Trans Pecos regions of the state. With the SH 45SW ROW located on the eastern margin of the Edwards Plateau, it falls within the potential breeding range of the species in western Hays and Travis counties. Most black-capped vireos arrive on their breeding grounds in Texas in late March or early April, with migration to the wintering grounds generally occurring in September (USFWS 1991).

Typical breeding habitat for the black-capped vireo consists of relatively dense deciduous shrublands with vegetation cover down to ground level. Larger trees may be present in areas occupied by black-capped vireos, although the canopy layer is typically open. Areas occupied by black-capped vireos often contain a greater diversity of shrub species than do nearby areas where the species is absent. Shrublands occupied by vireos usually develop on limestone substrates and are dominated by oak (*Quercus* spp.) or sumac (*Rhus* spp.). However, the species can also occur on sandy substrates or wherever suitable dense shrubby vegetation is present. The USFWS has not designated critical habitat for the black-capped vireo.

Based on observations made from adjacent City of Austin properties and a study performed for the Lower Colorado River Authority (SWCA 2006), no suitable habitat for the black-capped vireo was believed to occur in the SH 45SW ROW, and so the regular occurrence of the species in the ROW was not expected. Nonetheless, a survey for the black-capped vireo was performed in the SH 45SW ROW in the spring of 2014 by SWCA in accordance with USFWS presence/absence survey protocols for the species. This survey was conducted for two reasons. First, SWCA had been hired to survey the SH 45SW ROW for another endangered songbird, the golden-cheeked warbler, and a survey for the vireo could be included in the survey at nominal extra cost because USFWS survey protocols for the two species are nearly identical (i.e., the two can be surveyed for at the same time). Second, second-year male black-capped vireos (those returning to Texas for the first time) have been found in unexpected places (P. Sunby/SWCA pers. obs.). It was known that some minor vegetation clearing activities

would need to be performed in the spring of 2014 as part of on-going karst investigations and TxDOT wanted to be 100% certain that those clearing activities would not disturb black-capped vireos.

Lands owned by the City of Austin and occurring within 300 feet of the SH 45SW ROW were also surveyed for the black-capped vireo in the spring of 2014. These surveys were performed by City of Austin biologists. No black-capped vireos were detected in or adjacent to the SH 45SW ROW during the 2014 surveys (SWCA 2014, K. Thuesen/City of Austin, pers. comm. to SWCA on 5 June 2014). Based on a lack of suitable habitat and negative survey results, black-capped vireos are not expected to occur regularly in the ROW and no adverse impacts to this species are expected as a result of construction and use of SH 45SW.

Two subspecies of **burrowing owl** occur in the United States; the sub-species known as western burrowing owl is the only sub-species that occurs in Texas (Lockwood and Freeman 2014). This is a small, ground-dwelling owl that is often active during the day (Ehrlich et al. 1988). Burrowing owls do not nest in Travis or Hays County, but can occur in the region during the spring and fall migration periods and the winter months, when they are considered rare (Travis Audubon Society 2003). This species is traditionally found in open grassland prairies, plains, and savannas and roost in abandoned burrows or in natural or manmade cavities (TPWD 2014). Regionally, the species is much more apt to occur in winter east of the Edwards Plateau in the Blackland Prairies where lands have been extensively converted to agricultural purposes (Lockwood and Freeman 2014). In winter, burrowing owls in Travis County often occur in association with small culverts (P. Sunby/SWCA pers. obs.). The SH 45SW ROW does not contain any habitat typically used by wintering burrowing owls, but individuals of the species could occasionally occur temporarily in the more open portions of the ROW during migration. Construction of SH 45SW is not expected to cause the loss of any habitat used regularly by burrowing owls, so this project is not expected to have any significant adverse impact on western burrowing owl populations or alter its status in the region.

Golden-cheeked warbler is a small, migratory songbird that was listed as endangered in 1990 because of imminent and continuous destruction of breeding habitat. The breeding range of the golden-cheeked warbler is restricted to the State of Texas, where it occurs primarily in the Edwards Plateau and Cross Timbers regions of central and north-central Texas. It is a regular nesting species in both Hays and Travis counties. Most warblers arrive on their breeding grounds in early to mid-March. Golden-cheeked warblers generally begin their migration southward in July or early August. The species winters in the highlands of southern Mexico and northern Central America (USFWS 1992).

Breeding habitat for the golden-cheeked warbler consists of woodland that has a closed or nearly closed canopy and is composed of a mixture of mature Ashe juniper and broad-leafed hardwood trees, especially oaks such as Texas oak and plateau live oak. Depending on geographic locale, other hardwood tree species found in golden-cheeked warbler breeding habitat can include shin oak, Lacey oak (*Quercus glaucoides*), post

oak, blackjack oak, escarpment black cherry (*Prunus serotina* var. *eximia*), Arizona black walnut (*Juglans major*), Texas ash (*Fraxinus texensis*), and cedar elm (*Ulmus crassifolia*), among others. The USFWS has not designated critical habitat for the golden-cheeked warbler.

TxDOT commissioned a survey of the SH 45SW ROW for the golden-cheeked warbler in the spring of 2014 to determine the status of the species in the ROW. This survey was prompted by the presence of some woodland in the ROW that shares characteristics with known golden-cheeked warbler habitat, and knowledge that the species had occurred irregularly on lands owned by the City of Austin on either side of the SH 45SW ROW (SWCA 2013). The survey of the SH 45SW ROW for golden-cheeked warblers in the spring of 2014 was performed by SWCA and covered all woodland present in the ROW that even remotely resembled warbler habitat, and was extended to woodlands occurring outside but within 300 feet of the ROW. The survey was conducted in accordance with USFWS presence/absence survey protocols for the species, with off-site woodland surveyed by listening from ROW boundaries (SWCA 2014). No golden-cheeked warblers were detected in woodlands of the SH 45SW ROW by SWCA in the spring of 2014 (SWCA 2014).

City of Austin biologists also conducted a golden-cheeked warbler survey on lands owned by the City of Austin and occurring within 300 feet of the SH 45SW ROW in the spring of 2014. City of Austin biologists also did not detect golden-cheeked warblers on City of Austin lands adjacent to the SH 45SW ROW during 2014 surveys (K. Thuesen/City of Austin, pers. comm. to SWCA on 5 June 2014).

Based on the results of the 2014 surveys and past surveys conducted on City of Austin lands on either side of the SH 45SW ROW as summarized by SWCA (2014), it is known that golden-cheeked warblers do not occur regularly in woodlands contained within or adjacent to the SH 45SW ROW. While this suggests that construction of SH 45SW would have little if any effect on the golden-cheeked warbler, TxDOT commissioned SWCA to examine the effect that construction and use of the roadway would have on the golden-cheeked warbler. A summary of this examination is provided in Section 3.2 of this document.

The SH 45SW ROW is located at the very eastern edge of the breeding range of the golden-cheeked warbler where woodland is patchily distributed. As discussed below, the position of the SH 45SW ROW and adjacent City of Austin lands at the very edge of the range of the species is likely most responsible for the observed irregular occurrence of warblers on City of Austin lands.

Pulich (1976) observed that golden-cheeked warblers “are apt to be found in rather loose territorial groups, sometimes almost at random.” The tendency of individuals of the same species to choose to live close to one another is referred to as conspecific attraction. Such behavior has been documented in a wide variety of animals, and it has been suggested to exist in golden-cheeked warblers (Campomizzi et al. 2008). Many reasons have been given for conspecific attraction behavior, all of them plausible but not all necessarily applicable to golden-cheeked warblers. Peak (2010) found that male

golden-cheeked warblers will mate with more than one female warbler in a breeding season, and can even be involved with two nestings at the same time. Improving their chances to reproduce is one obvious reason golden-cheeked warblers might congregate in a particular area.

Regularly occurring populations of the golden-cheeked warbler are located west of the SH 45SW ROW as demonstrated by surveys conducted on lands owned by the City of Austin (SWCA 2013). If golden-cheeked warblers prefer to be close to members of their own kind, then it would make sense that any golden-cheeked warbler looking to settle in southern Travis County would choose to establish a territory farther to the west where they would have opportunities to interact with other warblers, instead of in an isolated patch of woodland along the SH 45SW corridor that is devoid of members of their own kind, regardless of the character of the woodland.

Two subspecies of **peregrine falcon** occur in Texas, the American peregrine falcon (*F. p. anatum*) and Arctic peregrine falcon (*F. p. tundrius*). The American peregrine falcon is listed as threatened by the State of Texas, while the Arctic peregrine falcon is considered a species of concern. This species is a swift-flying bird of prey that feeds primarily on other species of birds, especially pigeons, doves, shorebirds and waterfowl (Ehrlich et al. 1988). The American peregrine falcon nests very locally in mountainous regions of west Texas (Lockwood and Freeman 2014). Both sub-species migrate through the state of Texas and Arctic peregrine falcons are a rare winter resident in inland portions of the eastern half of the state, where they primarily occur in urban areas or near large bodies of water where concentrations of birds can be found (Lockwood and Freeman 2014). Migrant peregrine falcons fly through Travis and Hays counties on an annual basis and it is likely that one or more fly over the SH 45SW corridor each spring and fall. The SH 45SW ROW does not provide especially attractive hunting grounds for peregrine falcons because no features are present to serve to concentrate birds. Consequently, members of this species are most likely to be flying at relatively great height when crossing the SH 45SW corridor. However, even if they are flying lower, the birds are highly maneuverable and should be able to readily avoid construction activities and traffic. Consequently, no adverse impacts to peregrine falcons are expected to result from construction and use of SH 45SW.

Sprague's pipit is a songbird that typically occurs in native prairie and only occurs in Texas during migration and the winter months (TPWD 2014). On 15 September 2010, the Service determined the Sprague's pipit warrants protection under the ESA but listing was precluded by the need to address other listing actions of a higher priority. Sprague's pipit was designated by the Service as a candidate for listing until a listing proposal is introduced (USFWS 2010b). It is considered an uncommon visitor to Travis and Hays counties from about the middle of October through the middle of March (Travis Audubon Society 2003). Like burrowing owls, Sprague's pipits are most likely to occur in Travis and Hays counties to the east of the Edwards Plateau where grasslands and pastures suitable for use by the species are much more prevalent. The occurrence of Sprague's pipit in the SH 45SW ROW is not impossible, as migrant pipits forced down by inclement weather could occur nearly anywhere. But, the SH 45SW ROW and adjacent lands are dominated by woody vegetation communities, making them

unsuitable for use as wintering habitat by the species. Accordingly, the regular occurrence of Sprague's pipit in the ROW is not expected and construction and use of SH 45SW is not expected to adversely impact the species or alter its status in the region.

The **whooping crane** is a winter resident of marshes along the central Texas coast, although individuals will occasionally spend the winter inland well away from their traditional wintering grounds (Lockwood and Freeman 2014). The species follows a regular corridor during spring and fall migration, with this corridor encompassing Travis and Hays counties (Canadian Wildlife Service and USFWS 2007). Whooping cranes use a variety of habitats during migration, including croplands for feeding and wetlands for roosting (Howe 1987 and 1989, Lingle 1987, Lingle et al. 1991). Studies cited by the USFWS (2007b) suggest landscapes characterized as "wetland mosaics" provide the most suitable stopover habitat for whooping cranes. Appropriate stopover habitat for whooping cranes does not occur within the SH 45SW ROW owing to a lack of wetlands and domination by woody vegetation communities. Whooping cranes may fly over the SH 45SW ROW on a semi-annual basis, but no adverse impacts to this species are expected from the construction or operation of this roadway.

Zone-tailed hawk is a bird of prey typically associated with open, arid country; often found within canyons and near watercourses in this part of their range (TPWD 2012). The TPWD does not identify this species as expected to occur in Travis County (TPWD 2014), although a small number of the birds do occur in the western part of the county at least during the nesting season, where they typically occur in the Hill Country in canyons along the Colorado River corridor (Lockwood and Freeman 2014, P. Sunby/SWCA pers. obs.). This species also occurs as a rare winter resident in central Texas on the Edwards Plateau and nearby counties to the east (Lockwood and Freeman 2014). The SH 45SW ROW does not contain the rugged topography usually associated with nesting zone-tailed hawks, but the ROW is within the zone of dispersal for the species and vegetation in and adjacent to the ROW could occasionally be used by a zone-tailed hawk during migration or in winter. This species is not expected to nest in or adjacent to the SH 45SW ROW, and since vegetation within the ROW is not expected to be used on a regular basis by zone-tailed hawks, the species is not expected to be adversely impacted by construction and use of the roadway.

2.5.2 Mammals

Cave myotis is the largest species of the bat genus *Myotis* in Texas. The cave myotis is a year-round resident of the western two-thirds of Texas, although its distribution varies seasonally (Ammerman et al. 2012). In the summer, this species occupies the High Plains, Rolling Plains, Trans-Pecos, Edwards Plateau, and South Texas Plains ecoregions, but in winter the species is apparently restricted to the central and north-central parts of the state. Cave myotis roost primarily in caves and tunnels, but they also have been found in rock crevices, bridges, carports, attics, and old buildings (Ammerman et al. 2012).

Several caves and other karst features occur in and adjacent to the SH 45SW ROW. Flint Ridge Cave is known to be used by cave myotis (Elliott 1997). The cave did not

have an open entrance when first discovered (Elliott 1997), so presumably the bats began using it only after it was opened in 1984. No bats of any species were observed by Cambrian and SWCA in karst features within the SH 45SW ROW while conducting karst excavations and biota collections in the spring and summer of 2014 (K. White, Ph.D./Cambrian Environmental pers. obs.). It is considered possible that feature F-65 could receive occasional use by cave myotis given its size and pre-existing open entrance. Because potential roost sites are expected to be reasonably plentiful in the greater Project Area region, it is expected that some cave myotis fly and hunt over the SH 45SW ROW on a regular basis during the warmer months of the year. Construction of SH 45SW could, therefore, result in the loss of vegetation that supports a portion of the flying insects that provide the prey base for this species. Given the restricted nature of the proposed project, the loss of this vegetation is not likely to cause significant impacts to this species or alter its status in the region. The bridge that would be constructed over Bear Creek might be used for roosting by cave myotis, thereby providing beneficial shelter.

Plains spotted skunk is a sub-species of eastern spotted skunk, with the species occurring across much of the Great Plains and southeastern United States (Reid 2006). All eastern spotted skunks occurring in Texas are of the sub-species *S. p. interrupta* (Nilz and Finck 2008). Spotted skunks are rarely seen because they are nocturnal and the current status of the species in the state is unknown (Schmidly 2004). Plains spotted skunks occur most commonly in woodlands and tall grass prairies, where they are most often found in association with rocky canyons and rock outcrops (Schmidly 2004). Spotted skunks eat a wide variety of foods, including insects, small mammals, birds, fruits, and vegetables (Schmidly 2004).

Based on the types of vegetation communities present in the SH 45SW ROW, the occurrence of plains spotted skunk in the ROW is considered possible and perhaps most likely in proximity to Bear Creek, where slopes leading down to the creek are somewhat rocky. The status of this skunk in the SH 45SW ROW is unknown and so the effect that road construction would have on this species is indeterminate. If plains spotted skunk does occur in the ROW and on adjacent lands, then construction of the road would result in the loss of habitat used by, or available for use by, the species. Also, if spotted skunks do occur in the general area, use of SH 45SW would likely cause the species to suffer occasional collision mortality. SH 45SW is proposed to cross Bear Creek via a raised bridge. If in fact spotted skunks are most likely to occur in this corridor, collision mortality may be a rare event because of the ability of the skunks to cross SH 45SW under the bridge. On the other hand, if plains spotted skunks do not occur regularly in or adjacent to the SH 45SW ROW, then loss of vegetation to construction of the roadway would have a negligible impact on this species. Construction and subsequent use of the road could still result in the very occasional death of a spotted skunk as a result of collision mortality since it would be possible for dispersing spotted skunks to encounter the road.

2.5.3 Reptiles

Spot-tailed earless lizard occurs in semi-open brushy prairie that contains patches of barren ground (TPWD 2014). Based on this description, the occurrence of this species in the SH 45SW ROW is not expected because it generally contains a well-developed grass cover. Therefore, it is considered doubtful that the construction and use of SH 45SW would adversely impact this species.

Texas garter snake can occur in a variety of habitats, but typically utilizes grassy or weedy vegetation in proximity to creeks, ponds, lakes, or marshes (Werler and Dixon 2000). It is typically active by day and takes shelter at night beneath logs, debris, old boards, etc. (Werler and Dixon 2000). This species may occur in the SH 45SW ROW, where it appears most likely to be present along the Bear Creek corridor and any other low spots that can retain moisture. The true status of this species in the ROW is unknown. If present, construction of SH 45SW would result in loss of habitat available for use by the species. It could also conceivably cause the death of individual snakes if they were present in, and unable to escape from, areas disturbed by earth-moving equipment. Texas garter snakes could also then suffer from occasional vehicle collision mortality once the road was open for use, although as discussed for plains spotted skunk, the bridge over Bear Creek could provide this species with a safe travel corridor across the ROW in an area where the species may be most likely to occur. If not present in or adjacent to the ROW, then construction and use of SH 45SW would be expected to have negligible impact on this species.

Texas horned lizard was once common throughout most of Texas, but this species is now much more common in the western two-thirds of the state, including the South Texas Brush Country, than in central or eastern Texas (Linam 2008). Texas horned lizards occur in open, arid, and semi-arid regions with sparse vegetation, which can include grass, cactus, scattered brush, or scrubby trees (Linam 2008).

Donaldson, et al. (1994) conducted a survey of dozens of sites across the state of Texas for this lizard in 1992 and found that populations were generally strong in the southern region, stable in the north and west, and declining in the central region. No Texas horned lizards were reported east of a line extending south from Fort Worth to Corpus Christi (Donaldson et al. 1994). Commercial exploitation for the pet trade, vehicle collision mortality, pesticide use, and loss of native habitats to agricultural lands are historic reasons for the decline of this species (Bigony 1981).

The *Texas Horned Lizard Watch 10-year Summary Report: 1997–2006* (Linam 2008) reported a negative correlation with the number of Texas horned lizards and the abundance of red imported fire ants (*Solenopsis invicta*) and a positive one with the number of lizards and the abundance of red harvester ants (*Pogonomyrmex sp.),* the lizards preferred food source. Linam (2008) indicated that the Texas horned lizard has not been seen on the eastern edge of the Edwards Plateau “in many years.” Linam (2008) speculated that reasons for their decline on the Edwards Plateau likely include urbanization and red imported fire ants.

No Texas horned lizards were observed in the SH 45SW ROW by SWCA or Cambrian Environmental personnel while conducting the karst investigations and 2014 bird survey; these personnel were present in the ROW on almost all weekdays during the spring and summer of 2014 when Texas horned lizards are most active. The species also has not been reported as being detected during bird surveys conducted on adjacent City of Austin Water Quality Protection Lands (SWCA 2002, 2003, 2013; Baer Engineering and Environmental Consulting, Inc. 2009, 2010). Further, SWCA has never observed a Texas horned lizard anywhere on the Edwards Plateau in Travis or Hays counties over the past 24 years in which it has performed field work in the region (P. Sunby/SWCA, pers. obs.) While absence of Texas horned lizard from the SH 45SW ROW is not known with absolute certainty, it is considered highly probable that this species does not occur in the ROW and would not be adversely impacted by construction and use of SH 45SW.

2.5.4 Amphibians

Austin blind salamander lives in water throughout its life cycle. The species was first described in 2001 (Hillis et al. 2001) and was listed as endangered in 2013 (USFWS 2013). It has been collected only at three of four spring outlets collectively referred to as Barton Springs in the City of Austin, Travis County, approximately 9 to 10 miles northeast of the SH 45SW ROW. Based on morphologic characters typical of subterranean existence such as an absence of eyes and weak pigmentation, the primary habitat for this species is believed to be underground aquatic habitats of the Edwards Aquifer. The species is assumed to be restricted in occurrence to the Barton Springs Segment of the Edwards Aquifer because it has not been found at springs other than Barton Springs. Presumably this species occurs at the springs only after individuals are inadvertently flushed from the aquifer, or perhaps find their way to the surface by accident while dispersing (USFWS 2012). Hillis et al. (2001) reported that most individuals found at the springs have been juveniles. It is reasonable to believe that the smaller juveniles would have greater propensity for being washed out of primary subterranean habitat. The species feeds on aquatic invertebrates (Hillis et al. 2001).

Using genetic analysis, Hillis et al. (2001) found that the nearest known living relative to the Austin blind salamander is the Texas blind salamander (*Eurycea rathbuni*), which lives in subterranean aquatic habitat in the San Antonio Segment of the Edwards Aquifer in Hays County (Tipton et al. 2012). This relationship is understandable since the San Antonio and Barton Springs segments of the Edwards Aquifer are separated only by a groundwater divide that under extremely low flow conditions ceases to exist (Smith et al. 2012).[5] Thus, a scenario is easily envisioned where some cave-adapted salamanders from the San Antonio segment were able to move northward, or were even forced northward by dropping water levels, into the Barton Springs segment during an extended period of drought, with later increase in recharge volume leading to re-establishment of the barrier, isolation of the two populations, and development of the

[5] In general, the divide is the result of a comparatively high volume of water recharging the aquifer within the Onion Creek and Blanco River corridor. Recharge in this corridor creates a dome of groundwater that drains both south toward San Marcos Springs and north toward Barton Springs (Smith et al. 2012).

two separate species. Recent genetic analysis by Chippindale (2014) supports this relationship but also indicates evidence of hybridization among a complex consisting of *E. waterlooensis*, *E. rathbuni*, *E. sosorum*, and *E. nana*.

The primary threat to the Austin blind salamander is considered to be degradation of the quality and quantity of water in the aquifer that supports the species (USFWS 2012). The USFWS designated critical habitat for the Austin blind salamander in 2013. Both surface and subsurface critical habitat was designated. Surface critical habitat was designated as the three spring outlets at which the species has been found, plus spring outflow up to the high water line and 262 linear feet of upstream and downstream habitat as measured from the spring outlets, excluding manmade structures (USFWS 2012). Subsurface critical habitat was designated as underground features within a 984-foot radius of each of the three spring outlets.[6] Areas designated as critical habitat have very little influence on the quality and quantity of water in the Barton Springs Segment of the Edwards Aquifer.

Under the USFWS (2012) scenario, the Austin blind salamander does not occur in the Edwards Aquifer beneath the SH 45SW ROW. If, however, the species occupies a greater portion of the body of the aquifer, then possibility exists that it could occur in the aquifer at a depth, based on water well data and mapping of Flint Ridge Cave, of more than 150 feet beneath the ROW (Elliott 1997, Texas Water Development Board 2014), or at least closer to the ROW than the vicinity of Barton Springs.

Flint Ridge Cave has a water passage at its base approximately 152 feet below the surface (Elliott 1997). Biological surveys have been conducted in Flint Ridge Cave on numerous occasions and no *Eurycea* salamanders have been reported as having been detected there (Elliott 1997, Hauwert et al. 2011, Travis County and City of Austin 2011, 2012, 2013). Regardless of the extent to which this species occurs within subterranean habitat of the Edwards Aquifer, precipitation infiltrating the ground within the SH 45SW ROW and surface water runoff from the ROW do provide recharge to the Barton Springs Segment of the Edwards Aquifer and so contribute to the water that supports this species.

Barton springs salamander is another fully aquatic salamander that feeds primarily upon small aquatic invertebrates. Unlike the Austin blind salamander, this species occurs in surface water at and in the immediate vicinity of spring outlets, where it typically occurs in gravel or beneath rocks and litter. This species is one of several ecologically similar and closely related species of “spring salamanders” that occur in

[6] The 984-foot distance was used because it is the greatest distance of separation between any two of the three spring outlets at which the species has been collected. This was taken as evidence by the USFWS (2012) that the species at one time traveled 984 feet from one spring outlet to the other, and so the salamanders must be capable of traveling 984 feet in any direction from a spring outlet. This reasoning does not hold if the species actually occupies a greater portion of the aquifer and the three spring outlets are akin to three downtown exits from the same freeway. It also ignores the implications raised by evidence that the species’ nearest relative is another blind salamander that resides in the aquifer in Hays County.

central Texas (Hillis et al. 2001). Traditionally believed to be restricted in geographic extent to the four spring outlets of Barton Springs, recent genetic analysis of salamanders collected at Blowing Sink Cave in Austin and a few other springs (Cold Springs, Spillar Ranch Spring, and Taylor Springs) in southern Travis and northern Hays counties that discharge water from the Barton Springs Segment of the Edwards Aquifer indicate the species has a somewhat wider distribution (Chippindale 2014).

This species was listed as endangered in 1997 (USFWS 1997). Primary threats facing the Barton Springs salamander are considered the degradation of the quality and quantity of water discharging from Barton Springs resulting from urban expansion over the Barton Springs watershed (USFWS 1997). The USFWS has not designated critical habitat for the Barton Springs salamander.[7]

2.5.5 Fishes

Guadalupe bass is a small black bass that can reach a length of about 18 inches and weigh up to 3.7 pounds depending on habitat (Thomas et al. 2007). This species occurs on the Edwards Plateau in creeks and rivers of the Brazos, Colorado, Guadalupe, and San Antonio River watersheds, where they feed on a variety of invertebrates and small fish (Thomas et al. 2007). No habitat for Guadalupe bass is present in the SH 45SW ROW. Surface water runoff from the SH 45SW ROW is carried generally eastward by Bear Creek and other tributaries of Onion Creek, with Onion Creek joining the Colorado River to the east of the Balcones Escarpment and downstream of the primary range of this species. Water infiltrating the ground in the ROW is carried to Barton Springs, with discharge from the springs flowing into Lake Lady Bird, both being places where Guadalupe bass are known to occur. Construction and use of SH 45SW is not expected to alter the quality of water discharging at Barton Springs (see Section 3.1), so no impacts to Guadalupe bass are expected as a result of the project.

Smalleye Shiner The smalleye shiner was endemic to the Brazos River system, but it has been introduced into the Colorado River, where it may be found near Austin (Thomas et al. 2007). As with Guadalupe bass, no habitat suitable for this species is present in the SH 45SW ROW owing to a lack of perennial streams. This species may occur in Lake Lady Bird as a result of introductions, but for the same reason as discussed for Guadalupe bass, no impacts to this species are expected as a result of construction and use of SH 45SW.

2.5.6 Arthropods

An insect lacking a common name, referred to simply as a **mayfly** (*Procloeon distinctum*) by the TPWD but part of a group known as the long-clawed small minnow mayflies, is identified by the agency as a species of concern occurring in Hays County.

[7] The rationale of the agency for not designating the spring outlets at Barton Springs as critical habitat for this species, yet designating them as critical habitat for the Austin blind salamander, which must primarily occupy subterranean aquatic habitat within the aquifer rather than the springs themselves, is unclear.

Like all mayflies, the species has an aquatic larval stage. Wiersema (1999) indicated the larvae are often found in submerged stands of water willow (*Justica americana*). This mayfly was described as a new species by Wiersema (1999) based on specimens collected in the Blanco River near Kyle, Hays County. At that time it was known only from the Blanco River site and one site in Williamson County (Wiersema 1999). *P. distinctum* was synonymized with *P. texanum* in 2009 (Jacobus and McCafferty 2009). *P. texanum* was first described in 1993 based on collections made in the Navasota River in southeast Texas and has subsequently been found in Oklahoma and Kansas (Jacobus and McCafferty 2009), suggesting the taxon probably is not as rare as initially thought when *P. distinctum* was considered a valid species. Regardless of taxonomy, because no permanent aquatic habitat occurs in the SH 45SW ROW, construction and use of the roadway is not expected to disturb any suitable mayfly breeding habitat and no adverse impacts to this species are expected from the project.

Three of the species identified in Table 8 are tiny crustaceans that occur in aquatic habitats within caves. These include the **Balcones Cave amphipod, bifurcated cave amphipod**, and another **amphipod** (*Stygobromus russelli*) lacking a common name. The TPWD (2012) does not identify the latter two species on the list of rare species for Hays County, yet all three species have been collected in the county from San Marcos Springs (Holsinger and Longley 1980). Balcones Cave amphipod, bifurcated cave amphipod, and possibly *S. russelli* have also been collected at the Barton Springs complex (Geismar and Herrington 2007), indicating that at least two of these species are present in the Barton Springs Segment of the Edwards Aquifer. None of the species, however, has been collected in Flint Ridge Cave (Elliott 1997), which occurs adjacent to the SH 45SW ROW and contains humanly accessible subterranean aquatic habitat. Balcones Cave amphipod and bifurcated cave amphipod are assumed present in the pooled aquifer down-gradient of the SH 45SW ROW, and *S. russelli* may be present as well. Nonetheless, because construction and use of SH 45SW is not expected to adversely impact the quality or quantity of water discharging at Barton Springs (see Section 3.1), the potential for the project to adversely impact any of these amphipod species appears to be very low.

Bandit Cave spider (*Cicurina bandida*) is a tiny (0.2-inch) troglobitic meshweaver that occurs in caves south of the Colorado River in southern Travis and northern Hays counties. Typical habitat for this and other cave-dwelling invertebrates includes subterranean void space in permanent darkness with stable temperature and stable high humidity (USFWS 2005a). It was originally known from one cave (Bandit Cave) located on the west side of Austin in Rollingwood. Other species of cave-dwelling *Cicurina* spiders (*C. cueva*, *C. reyesi*) had been described from caves in this same region, with *C. cueva* having been identified in two caves, Cave X and Flint Ridge Cave (USFWS 2005a). Taxonomic studies based on morphology and a genetic assessment indicated the three *Cicurina* species were actually con-specific (USFWS 2005b). Both *C. bandida* and *C. cueva* were covered as non-federally listed species by the BCCP. As identified in Section 2.1.2, *Cicurina* spiders presumed to be Bandit Cave spider were found in three caves during the geologic assessment by SWCA/Cambrian Environmental (Cow Pattie Sink, F-65, and SH 45 Cave).

Bee Creek Cave harvestman is commonly thought to be a species adapted to subterranean life within caves of the Edwards Formation, but the species has well-developed eyes. Subsequent to its listing as endangered, specimens previously attributed to *T. reddelli* were reclassified into two species, Bee Creek Cave harvestman and another of the species identified in Table 8, Bone Cave harvestman (Ubick and Briggs 1992). In the Final Rule listing Bee Creek Cave harvestman as endangered, it was described as an eyeless troglobitic species (USFWS 1988). However, this description actually pertained only to specimens now classified as Bone Cave harvestman, a species that has typical troglobitic features such as longer legs and an absence of eyes (USFWS 1994). At the time of its listing, "Bee Creek Cave harvestman" was known only from five caves formed in the Edwards Formation on the Edwards Plateau in Travis and Williamson counties (USFWS 1988). However, since reclassification, new records of Bee Creek Cave harvestman have been made based on collections from caves and talus piles, and from beneath loose rocks present at the base of road cuts that have expanded the known range of the species westward into southwestern Travis County and southeastern Burnet County into portions of the Edwards Plateau not underlain by the Edwards Formation (Ubick and Briggs 2004). Thus, the Bee Creek Cave harvestman, in fitting with its possession of well-developed eyes and its occurrence across a variety of substrates, is now considered a troglophilic and epigean species, meaning one that lives at or near the surface (Ubick and Briggs 2004). Originally presumed to be restricted in geographic extent to caves developed across a limited exposure of the Edwards Formation, knowledge that the Bee Creek Cave harvestman occurs on the surface greatly increases its potential distribution. This in turn increases the upper limit of its possible population. We are not aware of anyone that is actively working to determine the true status of this species, so its full geographic range may remain uncertain for quite some time. Bee Creek Cave harvestman has not been collected from any of the karst features in the SH 45SW ROW (Cambrian Environmental and SWCA 2014a).

Bone Cave harvestman is an obligate cave-dwelling harvestman with a known distribution restricted to Travis and Williamson counties (Ubick and Briggs 1992, 2004). Ubick and Briggs (1992) originally described the species when it was separated from Bee Creek Cave harvestman subsequent to the listing of the latter species as endangered. At maturity, Bone Cave harvestman is a pale orange harvestman with a total body length ranging from 0.06 to 0.11 inch. Retinas are absent and corneal development varies from well-developed to absent (Ubick and Briggs 1992). Bone Cave harvestman has a wider distribution than other *Texella* species. At the time of listing, Bee Creek Cave harvestman was known to occur in five or six caves (all but Bee Creek Cave were later confirmed to instead contain Bone Cave harvestman) with a range that included approximately 75 square miles (21–31 linear miles). By the release of the 1994 Recovery Plan, the USFWS recognized 60 caves with confirmed occupancy by Bone Cave harvestman, and nine additional caves believed to be occupied by the species pending taxonomic confirmation (USFWS 1994). These caves represented a range of 135 square miles, an increase of 60 square miles. By 2009 when a Five-Year Review of the species was completed, the USFWS recognized 168 known localities for Bone Cave harvestman with an approximate range of 190 square miles (USFWS 2009). As mentioned in Section 2.1.2, one of these 168 localities was a cave located near the SH

45SW ROW. It has since been determined that the *Texella* specimen collected from this cave is not *T. reyesi* (Ubick 2014). As such, Bone Cave harvestman is not known to occur south of the Colorado River and this species is not expected to occur in the SH 45SW ROW.

Leonora's dancer is a damselfly that occurs on the Edwards Plateau in the vicinity of small streams, seepages, and swales, where sedges occur abundantly (Abbott 2011). Owing to a lack of permanent streams, it is considered doubtful that this species occurs regularly in the SH 45SW ROW. The species may occur regularly farther upstream along Bear Creek on City of Austin Water Quality Protection Lands, where water appears to occur on a near permanent basis (P. Sunby/SWCA pers. obs.). Consequently, if so, it is possible that adults of this species could wander downstream and occur occasionally along Bear Creek within the SH 45SW ROW, when that segment of the creek is holding water after a precipitation event. Because no permanent water is present in the SH 45SW ROW, construction and use of the roadway is not expected to disturb any habitat used regularly by this species, so no adverse impacts to the species are expected as a result of the project.

Rawson's metalmark is a small butterfly that occurs in moist areas in shaded limestone canyons in central Texas, as well as in desert scrub or oak woodland in foothills, or along rivers elsewhere (TPWD 2014). The larvae feed on thoroughwort (*Eupatorium havanense*), palmleaf thoroughwort (*E. greggii*), and turkey tangle frogfruit (*Phyla nodiflora*) (Wauer 2004). Thoroughwort is known to occur on the slopes along Bear Creek, suggesting suitable habitat for this species may be present in and adjacent to the SH 45SW ROW. This species may, therefore, occur in the SH 45SW ROW, although its actual status is unknown. Construction of SH 45SW could cause the loss of some vegetation available for use by this species, but whether that loss would result in adverse impacts to Rawson's metalmark is unknown.

2.5.7 Mollusks

Six species of freshwater mussels are identified in Table 8. All six historically occurred in the Colorado River watershed, and at least four (smooth pimpleback, Texas fatmucket, Texas fawnsfoot, and Texas pimpleback) were known from Onion Creek (Strecker 1931; UNT 2014). At least small numbers of Texas fatmucket are known to persist in Onion Creek in eastern Travis County in the vicinity of the State Highway 71 crossing (Wilkins et al. 2011). Populations of smooth pimpleback and Texas fawnsfoot persist in the Colorado River downstream of Travis County in Colorado County (USFWS 2011a). Texas pimpleback is now known to occur in the Colorado River watershed only in tributaries of the mainstem river upstream of Travis County (USFWS 2011a). The other two species identified in Table 8, creeper and false spike, are not known to have occurred in Onion Creek and like Texas pimpleback are not known to occur in the mainstem Colorado River within or downstream of Travis County (Howells et al. 1996, USFWS 2011a).

No suitable habitat for any six of these mussel species is present in the SH 45SW ROW owing to a lack of permanent water. A survey for freshwater mollusks and their habitat was performed by the Texas A&M Institute of Renewable Natural Resources in 2013 in

Bear Creek where crossed by the SH 45SW ROW, and down-gradient of the ROW in Bear Creek and other creek channels that receive surface water runoff from the ROW where crossed by public roads. No freshwater mollusks or suitable mollusk habitat were identified in any of the studied segments of creek channel (Cordova et al. 2013).

Water leaving the SH 45SW ROW can reach the Colorado River by infiltrating the ground and later being discharged at Barton Springs and then draining into Lake Lady Bird in the City of Austin, or by traveling eastward as surface flow via Bear Creek and other tributaries to Onion Creek, which joins the Colorado River in eastern Travis County. Given the pollutant removal efficiencies expected from the stormwater controls proposed as project BMPs, the vast amount of pre-existing development in the Colorado River watershed (e.g., the cities of Austin, Ballinger, Bastrop, Brady, Llano, La Grange, Marble Falls, San Angelo, San Saba, and Smithville, and what must be thousands of miles of roadway), and dilution that would be provided by water reaching Onion Creek and the Colorado River from other sources, the construction and use of SH 45SW is not believed capable of causing a measurable change in the quality of water in Onion Creek or the Colorado River in Colorado County at sites where populations of Texas fatmucket, smooth pimpleback, and Texas fawnsfoot are known to occur. As a result, no impacts to any of these three species are expected as a result of the project. No impacts to Texas pimpleback, creeper, or false spike are expected to occur as a result of the proposed project because none of these species is known to occur downstream of the SH 45SW ROW, but even if they did, no impacts would be expected for the same reason as discussed for the other three species.

2.5.8 Plants

Boerne bean was recently described as a distinct species based on study of *Phaseolus* herbarium specimens and new field studies (Delgado-Salinas and Carr 2007). It is a flowering vine that occurs in mixed woodlands developed in limestone canyons, where it typically occurs along creeks on cliffs or other rock outcrops (Delgado-Salinas and Carr 2007). Blooming period is the fall (Sept.-Nov.). Boerne bean may be restricted to canyons developed along the southern and eastern margins of the Edwards Plateau and is known to occur in Bandera, Kerr, Travis, and Uvalde counties (Delgado-Salinas and Carr 2007). Many of the plant species with which Boerne bean is known to associate as described by Delgado-Salinas and Carr (2007) are present in the woodland along the north bank of Bear Creek within the SH 45SW ROW. However, known sites of occurrence are along perennial streams. Thus, woodland developed along the ephemeral segment of Bear Creek crossed by the SH 45SW ROW may be too dry to support this species. Given this, it appears more likely that the species is not present in the SH 45SW ROW, but its occurrence in the ROW along Bear Creek is considered possible.

Bracted twistflower is a spring-blooming wildflower endemic to the Edwards Plateau, with a spotty distribution of known or historical occurrences in Bandera, Bexar, Comal, Medina, Real, Travis, and Uvalde counties (Poole et al. 2007). It is not known to have occurred in Hays County and is not known to occur in the SH 45SW ROW. Lands in and adjacent to the SH 45SW ROW were not identified as potential habitat for this species

by McNeal (1989). This species typically occurs on steep to moderate slopes or in canyon bottoms within oak/juniper woodlands on slopes or canyon bottoms with thin, well-drained, gravelly clay or clay-loam soils developed over massive layers of low-porosity limestone or dolomite (Poole et al. 2007, Pepper 2008). The species is closely associated with the Glen Rose, Walnut, and lower Edwards geological formations (Pepper 2008). The Glen Rose and Walnut formations lie stratigraphically below the Edwards. The SH 45SW ROW is underlain by upper units of the Edwards Formation and other formations that lie stratigraphically above the Edwards (SWCA and Cambrian Environmental 2014a).

Poole et al. (2007) indicate the species typically occurs amid dense shrub growth in woodlands and associated openings that also support a high diversity of herbaceous understory species. Bracted twistflower is identified by Poole et al. (2007) as often occurring in association with certain woody plant species (e.g., plateau live oak, Texas persimmon, elbowbush, and mountain laurel), but these are common, widespread species so presence of these associates are not useful for identifying areas where bracted twistflower may occur.

Soil associations on which the species usually occurs include Tarrant, Brackett, and Speck (Poole et al. 2007). Nearly the entire SH 45SW ROW is covered by Speck soils (Soil Conservation Service 1974). Vegetation in the ROW on the slope that leads down to Bear Creek from the north shares some characteristics of bracted twistflower habitat in that it consists of semi-open woodland containing a moderately diverse assemblage of shrub species. However, topography of the ROW and adjacent land is overall relatively gentle, the terra rossa soils that cover most of the project area are poorly draining, none of the ROW overlies massive layers of low-porosity limestone, and the geology of the ROW does not match that known to be associated with occurrence of this species. Overall, the geology and topography of the SH 45SW ROW do not match the geology and topography present in areas where this species is known to occur, and away from Bear Creek vegetation within the ROW does not have the structure typically associated with species occurrence. These reasons, coupled with location of the Project Area on the Hays County line where the species is not known to occur, suggests it is highly doubtful that bracted twistflower is present in the SH 45SW ROW. Consequently, construction of SH 45SW is not expected to cause adverse impacts to this species.

Correll's false dragon-head is a large member of the mint family, growing 6 feet tall or more, and creating showy spikes of pink flowers from May – Sept. (Poole et al. 2007). This species occurs in saturated soils on creek and river banks, as well as in irrigation canals and drainage ditches (Poole et al. 2007). No perennial streams are crossed by the SH 45SW ROW, so no suitable habitat for this species is present in the Project Area. Accordingly, no adverse impacts to Correll's false dragon-head are expected from construction of SH 45SW.

Hill Country wild-mercury is an herbaceous perennial endemic to the Edwards Plateau that historically occurred in Hays County and is not known to have occurred in Travis County (Poole et al. 2007). According to Poole et al. (2007) this species typically

occurs in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams covering limestone on rolling uplands. The habitat description for this species generally matches much of the open woodland present within the SH 45SW ROW. However, its apparent extirpation from Hays County and absence from Travis County indicate that occurrence of this species in the SH 45SW ROW is unlikely. Consequently, no adverse impacts to this species are expected as a result of construction of SH 45SW.

Warnock's coral root is a perennial orchid that occurs from Baja California Sur across southern Arizona to Texas (Poole et al. 2007). Distribution of its occurrences in Texas suggests this orchid may occur more widely in the state than is known. Warnock's coral root has been documented in Texas in Brewster, Culberson, Jeff Davis, Presidio, and Terrell counties of the Trans-Pecos, Gillespie (historical), Hays, Real, and Travis counties on the Edwards Plateau, and Dallas and Taylor counties in the north-central portion of the state. Warnock's coral root occurs on shaded slopes in leaf litter and humus of oak-juniper woodlands; on the Edwards Plateau the species typically occurs in Texas oak/Ashe juniper woodlands (Poole et al. 2007). Woodlands present in the SH 45SW ROW are predominantly composed of Ashe juniper, live oak, cedar elm, and post oak, with very limited numbers of Texas oak. Apart from the slopes leading down to Bear Creek, the ROW lacks "shaded slopes" and throughout the ROW contains negligible amounts of woodland with a well-developed floor of humus and leaf litter. For these reasons, it appears more likely that this species is absent from the ROW than it is present. Accordingly, it also appears more likely that construction of SH 45SW would not adversely impact this species. However, presence of this species in the ROW cannot be ruled out conclusively.

3.0 PROPOSED WATER QUALITY AND QUANTITY PROTECTION MEASURES

3.1 EDWARDS AQUIFER RULES COMPLIANCE

The TCEQ promulgated the Edwards Aquifer Rules to regulate activities with potential to pollute the Edwards Aquifer and its hydrologically connected surface streams.[8] As indicated previously, the SH 45SW ROW lies within the recharge zone for the Barton Springs Segment of the Edwards Aquifer.

This section describes water pollution control measures that have been and will be incorporated into the design and construction of SH 45SW as stormwater control measures and best management practices (BMPs), with the primary goals of protection of the quality and quantity of water discharging at Barton Springs and conservation of the Barton Springs salamander and the Austin Blind salamander – two federally listed species that depend on water contained in the aquifer. The BMPs described herein pertain to water quality and quantity. They will be elements of a water pollution

[8]Title 30 TAC Chapter 213 available at http://www.tceq.texas.gov/assets/public/legal/rules/rules/pdflib/213a.pdf.

abatement plan (WPAP) that is required for compliance with the TCEQ Edwards Aquifer Rules.

The established performance standard for permanent stormwater control measures in the Edwards Aquifer Rules is adequate to protect water quality at Barton Springs based on a recent evaluation of City of Austin monitoring data (Herrington and Hiers 2010) by Dr. Michael Barrett of the University of Austin Center for Research in Water Resources. Dr. Barrett concluded that stormwater controls have been effective in preventing degradation of water quality at Barton Springs from stormwater.[9]

The roadway project as designed would exceed the minimum standard of the Edwards Aquifer Rules of removing at least 80% of the incremental increase in total suspended solids (TSS). At least 90% of the incremental increase in TSS will be removed from runoff in the recharge zone. Permanent stormwater control measures will be used in combination to achieve more than 90% total efficiency.

Proper selection and implementation of stormwater control measures and other BMPs are fundamental. A combination of measures, when implemented as a whole, would provide water quality protection to sensitive karst features occurring in proximity to the SH 45SW ROW and to the Edwards Aquifer.

The description of stormwater control measures and BMPs that follows is organized according to project phases: 1) those incorporated prior to construction in the design phase; 2) those to be implemented during construction; and 3) those to be implemented after construction is complete in the operation and maintenance phase. References are provided for standard control measures used on projects throughout the state by TxDOT that are contained in manuals and inspection procedures.

3.1.1 Design Phase (Pre-construction) Best Management Practices

Multiple design phase actions are being taken to ensure that construction of the roadway would be protective of water quality and maintain existing water quantity in the Barton Springs Segment of the Edwards Aquifer. Most of these actions have been completed or are underway, while final preparation of the required Stormwater Pollution Prevention Plan (SW3P) and the WPAP will not take place until construction plans are nearly complete. Pre-construction actions that have been taken or are being taken to ensure compliance with the Edwards Aquifer Rules include:

- Conduct geologic assessment to identify sensitive karst features that will be protected
- Adjust roadway alignment and configuration to avoid sensitive karst features
- Identify drainage controls to maintain flow to sensitive features

[9] *Effectiveness of Stormwater Regulations in the Barton Springs Zone*: Presentation given by Dr. Michael Barrett to the Capital Area Erosion Control Network on 23 October 2014.

- Identify appropriate locations for staging areas
- Estimate construction schedule
- Identify permanent BMPs to protect water quality
- Prepare detailed plans (SW3P, Environmental Compliance and Mitigation Plan [ECMP], WPAP) to ensure protection of water quality and quantity

3.1.1.1 Protection of Karst Features

Identification of sensitive karst features is a pre-construction phase activity that has been completed. Two geologic feature assessments have been conducted within the SH 45SW ROW, one in 2007 and one in 2013-2014. The 2007 geologic survey identified 21 potentially significant karst features (aci 2007). These are essentially equivalent to features defined by the TCEQ as "sensitive features".[10] The recent geologic assessment investigation, which included excavation of potentially significant features to verify presence/absence of hydraulic interconnectedness between the surface and underlying aquifer, has narrowed the list to 17 sensitive features (SWCA and Cambrian Environmental 2014a). See Table 1 for a comparison of the features identified in the two assessments. No water wells or other sensitive manmade features were identified in the assessments. Sensitive features are given protective status in the construction plans. Locations of the 17 sensitive features are being identified on construction plans as they are developed. Protective barriers, i.e. gates, fencing, traffic barriers etc. would be installed around sensitive features (see Section 3.1.2).

The proposed roadway alignment has been changed slightly to avoid known sensitive karst features since issuance of the SH 45SW DEIS. The alignment examined in the DEIS reflected considerations to avoid potentially sensitive features identified in the 2007 karst survey. The alignment was adjusted based on desire to avoid known sensitive features within and outside the SH 45SW ROW as identified in the 2014 karst survey. A series of maps provided as Appendix A compares the alignment as shown in the DEIS against the currently proposed alignment.

Near MoPac, the intersection was changed to avoid SH45 Cave (features F-157a and F-157b) and accommodate public safety concerns. In the vicinity of Bear Creek, the east (or south) end of the bridge was shifted to the north (or east) to avoid Jubilee Cave (feature F-110) and its surface drainage basin. The roadway alignment was also moved to run between Jubilee Cave and a set of features referred to as F-64/F-65 (unnamed caves) to avoid those features and their surface drainage basins. The shared use path in this same area was moved onto the Bear Creek bridge to prevent additional soil disturbance in the floodplain and to avoid Jubilee Cave, Dijerido Cave (outside the state

[10] TCEQ defines a sensitive feature as "a permeable geologic or manmade feature located on the recharge zone or transition zone where a potential for hydraulic interconnectedness between the surface and the Edwards Aquifer exists; and rapid infiltration to the subsurface may occur." An analogous term is recharge feature especially if there is a definite connection between the surface and the aquifer.

owned ROW), and features F-64/F-65 as well as the surface drainage basin for these features.

In the vicinity of Flint Ridge Cave, the road alignment was moved as far south (or west) as possible to avoid the cave opening and its subterranean passage and to reduce impacts to its drainage basin. The overall adjustment to the south also helped to avoid Jubilee Cave. A protective berm proposed to be built to protect Flint Ridge Cave in the design examined in the DEIS was replaced with retaining walls.

Some adjustments to the roadway alignment and design were chosen by the Technical Work Group, the most important of which are in the vicinity of the Flint Ridge Cave drainage basin due to the significance and sensitivity of this feature. The group preferred an undivided (compact) section of roadway between Bear Creek and MoPac. The advantages of this design are that it reduces the overall footprint of the roadway and preserves Hat Sink (feature F-23). The proposed alignment would impact approximately 0.13 acre of the Hat Sink drainage basin, but total impact was minimized by designing an undivided roadway section in the vicinity of this feature. A culvert would be installed to convey runoff from undeveloped land outside the ROW under the proposed roadway to Hat Sink, thereby allowing much of the surface drainage basin to continue to function naturally.

The amount of pavement that would cover sensitive feature drainage basins has been quantified and compensating drainage areas have been selected to maintain flow volume to the features. A series of drainage details on maps provided in Appendix B illustrates the locations of these compensating areas and drainage controls. Without compensation, approximately 0.71 acres would be removed from the Flint Ridge Cave drainage basin and 2.55 acres would be removed from the F-55 drainage basin; and the aforementioned 0.13 acres would be removed from the Hat Sink drainage area. The project would include measures to grade the land so that it would drain as indicated in these compensating areas adjacent to the natural drainage areas. A bottomless culvert is planned to span F-55 to allow water to infiltrate as it is conveyed from up-gradient areas beneath the roadway and provide recharge to the feature.

At least two construction staging areas would be needed within the ROW for the project. One would be located south of Bear Creek and the other would be located to the north. No staging area would be situated with any protected area such as the drainage basin to Flint Ridge Cave or any other sensitive karst feature. Specific environmental controls for construction staging needs would advance with the SW3P.

3.1.1.2 Soil Protection Measures

The amount of time soils would be exposed would be minimized by phasing construction to limit the amount of disturbed area present in the ROW at any given time. Construction phasing would be planned with the input of the engineering work group (a subgroup of the technical work group).

3.1.1.3 Permanent Water Quality Measures

The selection of permanent stormwater control measures is performed in the design phase, although installation of these features occurs during the construction phase. The initial selection of permanent stormwater control measures was based on the goal of achieving at least 90% removal of the incremental increase in TSS on the recharge zone. Final selection of the type of water quality ponds would be made with the input of the engineering work group. Measures identified as available to achieve this goal include permeable friction course (PFC) overlay, vegetated filter strips, water quality ponds, and hazardous material traps. Proposed locations and volumes of water quality ponds and hazardous material traps have been identified. It is expected the permanent measures would be placed in series to maximize removal efficiency of TSS and other particle-associated pollutants.

Permanent water quality structural controls have been preliminarily selected to optimize pollutant removal for multiple constituents found in highway runoff in the Austin area. The controls mainly function by either:

- **Filtration** – stormwater is filtered through media such as porous asphalt overlay, vegetation, or sand to remove stormwater pollutants; or

- **Detention** – stormwater is detained and released to the receiving stream through a controlled outlet over a specified time period. Removal of pollutants is achieved by settling and sedimentation. Hazardous material spills would be controlled by detention.

The controls that would be constructed or utilized to ensure that the project would be protective of water quality are described below. The list is ordered in the direction of the "treatment train" meaning that the first control is PFC overlay on the roadway, next are vegetated filter strips and grassy swales located in ditches beside the roadway, and then the most downstream controls, hazardous material traps combined with a water quality pond. The current schematic of the proposed roadway includes 10 water quality basins in which up to three levels of stormwater treatment have been calculated. The permanent stormwater control measures being considered are:

Permeable Friction Course (PFC) – porous asphalt applied over conventional pavement that has water quality benefits. Rainfall filters through the open spaces of the asphalt to the underlying pavement and then drains to the edge of pavement. The porous surface also reduces splash, which reduces the washing of pollutants from the undersides of vehicles traveling over the roadway (Barrett 2006). During its operational life, PFC reduces pollutant concentrations along the roadway and provides filtration of contaminants. PFC reduces the amount of TSS in runoff by 90% (TCEQ 2005). Concentrations of TSS, total metals, and phosphorus were found to be significantly lower in runoff generated from the PFC surface than in the runoff from a conventional hot mix asphalt surface (Barrett 2006, Sampson et al. 2013).

Vegetated filter strips – vegetated sections of land located adjacent to the roadway shoulder or median that have moderate slopes designed to accept runoff as overland sheet flow. Pollutant removal is achieved through velocity reduction, filtration by vegetation, and infiltration. Optimal performance of a vegetated filter strip relies on maintaining a dense mix of erosion resistant vegetation. Filter strips reduce the amount of TSS by 85% (TCEQ 2005).

Grassy Swales – are designed to convey stormwater runoff parallel to a roadway at a non-erosive velocity, as well as enhance its water quality through infiltration, sedimentation, and filtration. Vegetation covering the slopes and bottom of a swale reduces flow velocity and provides a filtration surface as runoff is slowly conveyed to a downstream discharge location. Grassy swales reduce the amount of TSS by 70% (TCEQ 2005). The effect of swales has not been counted towards removing TSS for the project because they are less efficient that other treatment measures.

Hazardous material trap – a structural control that captures and contains liquid hazardous material spills or the first flush of stormwater runoff. A siphon device can be incorporated into the feature to drain the trap after it becomes full from a rain event. Such devices are installed at an elevation above the full capacity of the trap in order to contain any spill that does not occur during a rain event (TCEQ 2007). In the final design phase, TxDOT will consider all prudent design elements including the best way to completely contain potential discharges of hazardous materials. Hazardous material traps would be incorporated into all water quality ponds. The traps would be capable of containing at least 10,000 gallons of liquid hazardous materials in the event of a spill, or an equivalent volume of stormwater. The average volume of hazardous material spilled on Texas roads during a spill event is 860 gallons (see Appendix C), suggesting the minimum 10,000-gallon trap size should be capable of capturing any hazardous materials spilled onto SH 45SW during the construction and post-construction phases.

Batch detention basin – an extended two-part detention pond that is modified to operate in a cycle. Stormwater is temporarily stored in an upper basin. After a 12-hour detention time, a valve is opened to allow the stormwater to drain into the second, lower basin. The valve is closed after the first basin has drained. Batch detention primarily removes particulates and reduces peak flow rates. They are recognized as being 91% efficient at removing TSS (TCEQ 2007).

Sand filter basin – captures stormwater runoff and then filters it through a horizontal bed of sand. Treated runoff flows through a gravel underdrain system containing a network of perforated drainage pipes. Particulates are removed by sedimentation and filtration. A sand filter basin reduces TSS by 89%.

Bioretention basin - is similar to a sand filter basin except that it includes additional organic and soil material in the filtration media to support vegetation. A bioretention basin removes pollutants through a variety of physical, biological, and chemical treatment process. These facilities consist of plants inside a ponding area, mulch layer, planting soil, and an underdrain system. A bioretention basin reduces TSS by 89% and has both been shown to provide enhanced nutrient removal (TCEQ, 2005).

Detention basins with vertical sand filters and hazardous material traps are already present adjacent to Mopac near its proposed intersection with SH 45SW. These features would receive some runoff from SH 45SW and were assigned an efficiency value of 75% in TSS removal calculations. There are several advantages of a batch detention pond versus a traditional sand filter. The TSS removal efficiency is higher in a batch detention pond compared with a sand filter, although in the case of SH 45SW, upstream water quality controls would remove a majority of TSS before runoff reached a pond. Another advantage is that a batch detention pond requires a lower head (the difference between the inlet and outlet elevations), making it a good choice because this type of water quality pond requires less excavation. The footprint of a batch detention pond is also smaller than a sand filtration pond.

3.1.1.4 Stormwater Pollution Prevention Plan

The preparation of a SW3P is done in the pre-construction planning phase. The SW3P must to be prepared as part of the WPAP and to comply with the TCEQ General Construction Permit (CGP). The SW3P is a project specific document that is incorporated into the final construction plans. When implemented, it would be adjusted as necessary during the construction phase to adapt to conditions encountered in the field.

Construction practices outlined by the Engineering Subcommittee of the Technical Working Group would be incorporated into the SW3P. These are expected to include phased construction, limiting area of disturbance, installing the permanent water quality measures in the early phases of construction, preventing natural drainage from outside the ROW from mixing with construction runoff prior to treatment, controlling the quality of imported fill material, separating and treating construction runoff, and construction oversight by an on-site environmental compliance monitor.

The use of temporary stormwater control measures would be part of the SW3P. Sediment controls such as silt fence and rock filter dams would be sized based on standard TxDOT criteria. Silt fence is sized for the 2-year 24-hour storm (about 3.2 inches for Travis County) for a drainage basin not to exceed 2 acres and for a flow rate of 100 gallons per minute (gpm) per ft^2. Rock filter dams are also sized for the 2-year 24-hour storm and for a flow rate of 60 gpm/ft^2.

Temporary controls vary in their ability to trap and remove TSS. The variety of TSS removal efficiencies for temporary controls reported in the literature are explained in the DEIS. These values indicate how much pollutant removal can be achieved by each temporary control; however, there is no applicable regulatory requirement to remove a certain percentage of TSS or any other constituent from construction site stormwater runoff.

The SW3P would include general site data to identify the type of soil disturbing activities that would occur and the condition of existing soil and vegetation. The general site data would describe the pathway of stormwater discharges to receiving streams that would be authorized by the CGP. The SW3P would also include a description of erosion and

sediment controls that would include soil stabilization practices, structural practices, conveyance of stormwater, and a sequence of construction. Erosion and sediment controls would include tree protection fencing, silt fencing, mulch logs, rock berms, and stabilized construction exits. The construction plans would include the layout and specifications for temporary erosion and sediment controls. Their required quantities are also specified in the construction plans.

The implementation of the SW3P would begin prior to commencement of construction. The SW3P would be discussed at pre-construction conferences, and erosion and sediment controls would be installed and inspected prior to the start of construction. Other elements that would be specified in the SW3P include: how inspection and maintenance would be conducted on erosion and sediment controls and protected features; identification of waste materials, how they would be contained, and measures that must be taken in the event of an accidental release; and other objectives to minimize and control runoff of pollutants such as those found in construction vehicles.

3.1.2 Construction Phase Best Management Practices

This section discusses actions that would be taken during construction to ensure that the WPAP is successfully protecting water quality. Actions would also maintain the ability of surface flow to reach sensitive features in current volumes to ensure the quantity of water recharging the Edwards Aquifer is preserved. These actions would be prompted by the information conveyed in the construction plans, SW3P, and WPAP. Construction phasing would be detailed in the construction plans. The construction phase ends with acceptance of the construction by TxDOT, and can be measured by the establishment of final soil stabilization and completion of all permanent stormwater controls.

The TCEQ does not have a performance standard for temporary stormwater control measures, but the project would utilize a variety of measures and practices to achieve the highest level of compliance practicable. A rigorous temporary stormwater control measure design would be performed as the project moves forward. As discussed in the Technical Work Group meetings, applicable permanent stormwater control measures would be constructed in the early stages of the construction phase. Actions taken during construction to ensure compliance with the Edwards Aquifer Rules would include:

- Establishment of construction boundaries to exclude soil disturbance
- Installation of erosion and sediment controls
- Inspection of erosion and sediment controls and improvement of them if warranted
- Inspection of natural buffers around sensitive features
- Following construction sequencing to maximize the effectiveness of controls
- Following procedures to address the discovery of any new sensitive features
- Allowing for additional controls to be installed, and modification of the SW3P

Construction boundaries (limits placed on soil disturbance) would be confined within the SH 45SW ROW. Construction would be further limited to the area necessary to construct the proposed highway. Construction activity would be excluded from sensitive feature buffers. Gates would be installed over the openings to caves as shown on the maps in Appendix B 5 to prevent unauthorized entrance.

Installation of temporary stormwater control measures would take place at the beginning of the construction phase. Protective erosion and sediment controls that are specified in the construction plans, SW3P, and WPAP would be installed. After the installation of controls, inspections would be conducted in all areas that have not been stabilized and areas used for storage of materials that are exposed to precipitation. Inspections would be focused on searching for evidence of and the potential for pollutants entering the drainage system. Erosion and sediment controls would be inspected daily by the contractor and weekly by the project superintendent and the Environmental Compliance Manager to ensure their correct operation. These inspection frequencies are more stringent than required by the CGP and the TCEQ Edwards Aquifer guidance. The final EIS will include more detail about the environmental compliance management plan (ECMP) and BMPs that would be used during and after construction.

Construction sequencing used in the SW3P is vital for controls to be effective. At the beginning of the construction phase, water quality ponds would be constructed so they can function as sedimentation basins. Final construction of permanent stormwater control measures would take place as soon as practical.

Erosion and sediment control measures are intended to be adjusted and improved during construction. The TxDOT Construction Storm Water Pollution Prevention Plan Field Inspection and Maintenance Report would be used to document inspections during construction. Inspection frequencies are specified in these inspection forms. Inspection forms would also be used to document inspections of natural buffers around sensitive features.

Standard TxDOT procedures would be followed if a previously unknown sensitive feature is encountered during the construction phase. Features that may be encountered during construction include voids or water flowing through a conduit in bedrock. Equipment operators would visually check for these features during construction. If encountered, all excavation or other construction activity would immediately stop in the area. Equipment operators would notify their supervisor. Additional notices would be made to the TxDOT District Environmental Quality Inspector and specialists in the environmental section. These personnel would decide on an appropriate protective setback distance for the feature and any other appropriate BMPs to protect the feature while its significance is analyzed. Fencing or other barriers would be installed to prevent equipment operators from disturbing the protected setback area. The feature and its protective setback would be identified in the next regular on-site safety briefing. Any newly discovered feature would be inspected by a consulting geologist and biologist as appropriate and under the supervision of District scientists. The feature location would be surveyed and its extent documented as allowed by human accessibility. Biological surveys would be conducted as warranted by feature

type. Feature specific plans would be developed to protect the feature, if determined to be sensitive and as allowed by location, with the plans to be reviewed by TCEQ prior to implementation. Location relative to the road alignment and concomitant structural concerns may result in a decision to collapse or fill a previously unknown feature.

3.1.3 Post-Construction Best Management Practices

TxDOT is committing to perform several BMPs following completion of construction of SH 45SW to ensure the permanent stormwater control measures continue to function in their designed manner, and to identify any need to modify the environmental control system to improve its operation. Maintenance schedules and descriptions for each post-construction BMP would be specified in an Inspection, Maintenance, Repair and Retrofit (IMRR) plan. This document would be prepared for the WPAP and signed by TxDOT maintenance supervisors. Each post-construction stormwater control measure would have a unique IMRR plan.

The following operational procedures for post-construction BMPs would be proposed in the WPAP and are discussed below:

- Inspection and maintenance of permanent water quality controls
- PFC that is affected by a spill would be replaced
- Inspection and maintenance of natural buffers to protect sensitive features
- Operation of the Pest Management Program
- Operations to respond and cleanup spills

Permanent stormwater control measures would be inspected on a regular basis to ensure they were functioning properly and to identify any special maintenance needs. Inspections would be more frequent than suggested by TCEQ guidelines (TCEQ 2005), as is the case for the proposed water quality controls. Maintenance schedules and practices would follow the TCEQ guidance unless the results of inspections warrants otherwise. Clogging of PFC has been identified as a concern for the continued reliability of the performance of this pavement. TxDOT presumes the operational life of PFC is approximately 10 years and water quality benefits are expected to last through the typical design life of the pavement (Sampson et al. 2013). Testing the continued ability of the PFC to drain properly would be part of the regularly scheduled inspections. PFC is evaluated by TxDOT with a test that measures the permeability of the porous pavement.[11] After 2 years of service, the pavement will have a permeability inspection to determine if the PFC continues to achieve the intended Total Suspended Solids (TSS) removal. These tests will continue on a biennial basis. If drain-time does not exceed 100 seconds, the PFC still has optimum TSS removal capability. The IMRR plan for maintenance plan calls for the testing frequency to increase depending on results.

[11] PFC is tested using TxDOT Designation Tex-246-F (Permeability or Water Flow of Hot Mix Asphalt), effective November 2009. The test reveals whether approximately 1.8 gallons of water will dissipate into the pavement in less than 20 seconds.

TxDOT would replace PFC that does not pass permeability testing rather than vacuum or flush it to restore permeability.

TxDOT uses an integrated pest management (IPM) approach to ensure healthy vegetative cover. TxDOT's roadside pest management program (PMP) addresses pest management issues.[12] Vegetation management practices are operated according to TxDOT's Roadside Vegetation Management Manual. Separate TxDOT manuals or guidelines are followed for herbicide operations, invasive species, and landscape inspection. TxDOT operates under a Memorandum of Understanding with the Texas Department of Agriculture to promote public safety, environmental protection, and the effective use of pesticides.

In the event of an accidental spill of hazardous materials, TxDOT works with other agencies and its contractors to secure the scene and implement appropriate spill response measures. Standard spill response procedures are outlined in various manuals and guidance documents:

- Occupational Safety Manual, Chapter 4: Hazardous Materials (revised 2014)
- Maintenance Management Manual, Chapter 7, Section 4 - Oil and Hazardous Material Spills (revised 2014)
- Maintenance Operations Manual, Chapter 5, Section: Emergency Spill Response (revised 2010)
- Guidance for Environmental Compliance at TxDOT Facilities, Small Spill Response (revised 2004) page 28, and Abandoned Hazardous Materials, page 30

TxDOT would follow State of Texas rules for spill response. In general, a hazardous material spill that affects soil is cleaned to background (usually non-detect) levels. Contaminated soil is excavated and removed in the cleanup process. Affected soil is sampled and tested to ensure background levels are attained.

An accidental release of granular materials on PFC would be removed and then swept. The PFC would then be evaluated for permeability. A spill of liquid hydrocarbons may cause deterioration of the asphalt binder and replacement of pavement would be required and performed. Responding personnel would flush the affected area and retrieve all the fluids to the extent practicable before replacing affected PFC sections.

TxDOT compiled and analyzed roadway spill data from federal, state, county and city databases for the time period 2003-2012 to quantify the probability of an accidental spill of hazardous liquids from mobile sources (i.e. vehicles, tanker trucks) occurring within the proposed project.[10] TxDOT calculated that a maximum of 5.6 hazardous liquids

[12] TxDOT conducted an environmental review of its pesticide management program; see TxDOT 2007, Final Supplemental Environmental Impact Statement of the Roadside Pest Management Program and TxDOT, 2011, Environmental Assessment of the Maintenance Program.

spills per billion vehicle miles traveled occurred on one of three existing parkways and highways in Travis County that are most similar to the proposed project. A memorandum about the compilation and analysis is attached as Appendix C.

4.0 POTENTIAL EFFECTS

4.1 VEGETATION

Construction of SH 45SW would result in the permanent loss of vegetation within the ROW in areas used for paved travel lanes, bridges, gravel shoulders, medians, and the shared-use path. Construction of the roadway would require temporary use of some portions of the ROW outside of those areas that will be permanently disturbed. Table 9 identifies the amount of vegetation that would be permanently and temporarily disturbed by construction of SH 45SW as proposed based on land cover mapping performed by the EMST and SWCA.

The EMST and SWCA mapping leads to a slight difference (0.83 acre) in total impact to vegetation expected from construction of SH 45SW. The SWCA total is lower largely because the site-specific mapping allowed for identification of non-vegetated features within the ROW (i.e., roads and structures) and the ability to discount them from the vegetation impact assessment. A total of 0.68 acre of roads and structures are located within the temporary and permanent disturbance footprint, accounting for nearly all the difference between the two impact totals. The remaining difference is accounted for by rounding and by the Rocky Creek Channel mapped by SWCA. It is known that Bear Creek will be spanned by a bridge and the channel will not be impacted, so the channel area within the disturbance footprint was discounted from the SWCA mapping impact total. This could not be done for the EMST mapping impact total.

While Table 9 identifies type of impact as either permanent or temporary, all impacts to woody vegetation communities would be permanent. Temporarily disturbed areas that currently support woody communities would be re-seeded with a native grass/wildflower mix and thus be converted to herbaceous communities. The SWCA mapping provides a more accurate estimation of the extent of woody vegetation communities that would be disturbed by construction of SH 45SW, with this mapping indicating that approximately 96.35 acres of woody communities would be lost to road construction. This is 8.47 acres greater than indicated by the mapping performed by the EMST. Based on the SWCA mapping, approximately 10.93 acres of woody vegetation communities would be converted to herbaceous communities.

Also based on the SWCA mapping, a total of approximately 17.35 acres of primarily herbaceous vegetation communities would be disturbed by construction of SH 45SW. Of that total, approximately 2.11 acres would be re-seeded with a native grass/wildflower mix. Again, this total is less than the amount the EMST mapping suggests would be available for re-seeding (3.08 acres) because the area included in the EMST total contains some paved roads and other currently non-vegetated land. The expected permanent loss of 15.24 acres of herbaceous communities would be partially

offset by the conversion of approximately 10.93 acres of woody communities in temporarily disturbed areas to herbaceous communities.

Table 9. Summary of Impacts to Vegetation Expected from Construction of SH 45SW.

EMST Land Cover Unit	Impact (ac.)		SWCA Land Cover Unit	Impact (ac.)	
	Perm.	Temp.		Perm.	Temp.
Woody Communities					
Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland	57.34	7.40	Semi-Open Oak-Juniper Woodland	23.12	2.84
Edwards Plateau: Post Oak Motte and Woodland	8.52	0.68	Open Oak-Juniper-Mesquite Woodland	19.02	2.05
Edwards Plateau: Live Oak Motte and Woodland	8.42	1.37	Hardwood Woodland	12.91	1.40
Native Invasive: Mesquite Shrubland	2.16	0.36	Invaded Pasture	10.61	2.06
Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest	0.98	0.20	Juniper-Oak Woodland	8.20	0.93
Edwards Plateau: Ashe Juniper Motte and Woodland	0.18	0.03	Mixed Juniper-Hardwood Woodland	6.14	1.25
Central Texas: Floodplain Hardwood Forest	0.07	0.00	Shrubby Live Oak Savanna	5.42	0.40
Native Invasive: Deciduous Woodland	0.04	0.03			
Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest	0.03	0.02			
Edwards Plateau: Ashe Juniper / Live Oak Shrubland	0.03	0.00			
Edwards Plateau: Oak / Ashe Juniper Slope Forest	0.00	0.00			
Sub-total	77.78	10.10	Sub-total	85.42	10.93
Non-Woody Communities					
Edwards Plateau: Savanna Grassland	20.73	2.68	Herbaceous	11.68	1.77
Urban Low Intensity	2.84	0.40	Ashe Juniper Savanna	2.06	0.07
			Live Oak Savanna	1.50	0.27
			Rural Residential	0.00	0.00
			Roads and Structures	n/a	n/a
			Rocky Creek Channel	n/a	n/a
			Stock Pond	0.00	0.00
Sub-total	23.57	3.08	Sub-total	15.24	2.11
Total	**101.35**	**13.18**	**Total**	**100.66**	**13.04**

The types of vegetation communities present in the SH 45SW ROW are generally common and widespread in western Travis and Hays counties and across the Edwards Plateau. The most abundant cover type in the SH 45SW ROW as mapped by the EMST is Edwards Plateau: Deciduous Oak / Evergreen Motte Woodland, occurring across approximately 105.89 acres or 58.9% of the ROW. The next most abundant cover type is Edwards Plateau: Savanna Grassland, which covers approximately 28.90

acres or another 16.1% of the ROW. As a result of their relative abundance in the ROW, these two communities would also incur the greatest loss as a result of the proposed construction of SH 45SW (64.74 acres and 23.41 acres, respectively). By way of comparison, approximately 83,589 and 112,670 acres of these cover types, respectively, were identified in the combined Travis/Hays county region by the EMST mapping. Owing to the general abundance regionally of the types of vegetation communities present in the ROW, the loss of vegetation from the SH 45SW ROW as a result of the proposed roadway construction is considered a relatively minor impact from a biological standpoint.

4.1.1 Oak Wilt

No oak wilt centers are known to occur in the SH 45SW ROW. An oak wilt center is known to occur on City of Austin land to the east of the ROW. The clearing of the ROW and construction of SH 45SW would, therefore, seemingly create a barricade that would prevent oak wilt from spreading via root systems from this center to land west of the ROW.

Construction of SH 45SW could lead to damage of some oak trees left standing on either side of permanently disturbed areas within the ROW. Damaged trees could then be susceptible to contracting oak wilt as a result of visits from insects that previously visited infected trees comparatively nearby to the east. To minimize the potential for the proposed construction to enable the spread of oak wilt to trees within the SH 45SW ROW, TxDOT would, as it consistently does, conduct construction activities in accordance with Texas Forest Service protocols (TexasOakWilt.org 2012b) to prevent the spread of oak wilt. These protocols include:

- Prompt painting of fresh wounds on oaks with wound dressing or latex paint at all times of year;
- Cleaning of pruning tools between sites and/or trees using a 10% bleach solution or Lysol™;
- Limiting the clearing/pruning of oak trees for non-emergency reasons to the period of 1 July – 31 January; and
- Immediate chipping of debris from diseased red oaks, promptly followed by burial or burning.

Based on the above, it appears very unlikely that construction of SH 45SW would enable the spread of oak wilt.

4.2 WILDLIFE

Construction of SH 45SW is expected to result in direct and indirect impacts to wildlife. Direct impacts would occur during the construction phase of the project, while indirect impacts would largely result from loss of habitat and presence and use of the roadway. Direct and indirect impacts to wildlife expected from construction and use of SH 45SW are discussed below.

4.2.1 Direct Effects

The clearing of ROW needed for construction of SH 45SW would be expected to occur in the fall or winter months in order to avoid the possibility of disturbing golden-cheeked warblers on adjacent lands (see Section 4.3.2) and to minimize the potential for clearing to destroy active nests of birds of any species. For this reason, few if any birds should be directly impacted by construction of SH 45SW. Birds are highly mobile and during the fall and winter all birds occurring in the SH 45SW ROW should be able to avoid active construction activities. Only if a bird was already sick or injured would it be expected to be unable to avoid construction activities if present in the ROW when clearing occurred. Similarly, birds would also be expected to be capable of avoiding the machinery and equipment that would be used to build the road.

While clearing of the ROW would be expected to occur during the fall or winter, actual construction of the road would be expected to extend through the subsequent nesting season. Therefore, it is not inconceivable that one or more birds could attempt to construct a nest in idle construction equipment, although such an event is not known to have occurred before within the Austin District of TxDOT (C. Newnam/TxDOT, pers. obs). If such an event were to occur, the nest would be removed by TxDOT personnel if it were discovered prior to any eggs being laid in it in accordance with USFWS policy. If, however, the nest was discovered after eggs were laid, and they were laid by a species of bird protected by the Migratory Bird Treaty Act (MBTA), the nest would remain undisturbed until: 1) the eggs hatched and the young fledged from the nest; 2) the nest was found to be unsuccessful (e.g., abandoned or depredated); or 3) TxDOT acquired a permit from the USFWS allowing re-location of the nest or its disposition with a wildlife rehabilitator. If the nest was built by a species of bird not protected by the MBTA, the nest would be removed by TxDOT personnel and placed undamaged and in its entirety in the nearest suitable location. Species of birds that have potential to occur in the SH 45SW ROW and could possibly choose to construct a nest in idle equipment are likely limited to Eurasian collared-dove, European starling, and house sparrow.

Most species of mammal are also expected to be capable of avoiding ROW clearing and road construction activities. However, some individuals of mammal species that take shelter in trees or tree cavities could be killed while the ROW is cleared. Such mammals could include Virginia opossums, common raccoons, North American porcupines, and various mice and rats. More mobile arboreal species such as ringtails and fox squirrels are more likely capable of avoiding harm from tree-clearing activities. Tree-roosting bats are migratory and not expected to hibernate in trees in the ROW (Ammerman et al. 2012), so no direct impacts to bats should result from clearing of trees in advance of road construction.

Clearing and grading of the ROW would also create potential to kill mammals that take shelter on the ground or in subterranean cavities. Most mammals taking shelter on the ground would be expected to be able to escape clearing/grading activities. However, it is possible that some smaller mammals, such as some mice, could attempt to take shelter in a hollow log or underground rather than flee and so be crushed by equipment or buried. Placement of fill in the ROW also creates the potential to bury and kill any

small mammals taking shelter underground in those sections where the roadway would be elevated to control the direction of surface water runoff.

Because the ROW is expected to be cleared during the fall and winter months, most reptiles and amphibians occurring in areas to be cleared would likely be killed by clearing/grading/filling activities because they would be inactive or not able to move quickly and so be incapable of escape. Amphibians that may be most likely to be killed by road construction activities include western slimy salamander and cliff chirping frog, since these regularly occur in subterranean cavities, and upland species such as western narrow-mouthed toad, red-spotted toad, and green toad, since they often take shelter beneath rocks (Tipton et al. 2012). Except for aquatic turtles, individuals of any of the reptile species identified in Table 6 are considered susceptible to being killed by ROW clearing and grading activities if actually present in and adjacent to the ROW.

4.2.2 Indirect Effects

Construction and use of SH 45SW would cause the loss and modification of habitat used by a variety of wildlife species. Traffic would create risk of collision mortality and the road would create a barrier to movement to some wildlife species. Some species of wildlife could also respond negatively to traffic noise and vehicular activity. Each of these possible indirect impacts to wildlife is discussed below.

4.2.2.1 Habitat Loss and Modification

The clearing of the SH 45SW ROW and construction of the roadway would result in the permanent loss of approximately 99.58 acres of vegetation, and conversion of another approximately 10.16 acres of woody vegetation to herbaceous communities. Loss of this habitat would result in the displacement of those individual birds, mammals, amphibians, and reptiles that were able to avoid harm from road construction activities but had home ranges contained within areas that were cleared. The displacement of these animals could lead to some inter- and intra-specific competition for resources among animals on adjacent lands. Larger animals (e.g., hawks, raccoons, skunks, coyotes, and white-tailed deer) that can be expected to have had home ranges extending beyond the width of the cleared roadway might have to adjust their home range boundaries to compensate for loss of habitat, which also could lead to competition for resources with neighboring members of their own kind.

Loss of the vegetation from the ROW would also decrease the amount of foraging habitat available to non-territorial animals such as bats, which might not shelter in the ROW but could hunt across the general area. It is doubtful, however, that the loss of habitat caused by construction of SH 45SW would be great enough to influence the size of the local bat population.

The loss of habitat from road construction would likely reduce slightly the local populations of many of the animal species that currently occupy the ROW and adjacent lands as a result in reduction of carrying capacity. However, because rather extensive amounts of undeveloped land are present on either side of the ROW, the loss of habitat

is not expected to be great enough to cause significant population declines or alter the composition of the local wildlife community (Andrén 1994).

Construction of SH 45SW would also increase the amount of roadway habitat in the ROW. While many species of wildlife do not regularly utilize this type of habitat, many other species that search for food along roads and road edges could benefit from presence of the roadway. These species could include those that eat carrion (e.g., vultures, crested caracara, and common raven), small mammals that prefer grassland habitats, and medium-sized predators, which may preferentially occur along roads because of increased availability of food resources (Adams and Geis 1983, Forman and Alexander 1998, Smith-Patten and Patten 2008). Construction of bridges as part of the roadway project could also provide shelter for cave myotis and some other bats (Ammerman et al. 2012).

The construction of SH 45SW could result in increased densities of non-native, invasive ant species in the ROW, notably red imported fire ants or tawny crazy ants (*Nylanderia fulva*). Red imported fire ants can be common in disturbed soils along roadsides (Stiles and Jones 1998), and either species appears to have potential to be inadvertently introduced to the ROW as a result of importation of the fill material needed to raise the roadway as proposed in the vicinity of Flint Ridge Cave. Both species create potential for displacement of native ant species, and either species could cause localized increase in predation rates on some reptiles, birds, and small mammals (Allen et al. 1994, Texas A&M Agrilife Research Extension 2010). As described in Section 3.1.1.4, the SW3P for the project will include measures to control the quality of imported fill material, which would reduce the potential for accidental introduction of invasive ants to the ROW. Much of the fill material used is expected to be cobble, which is less likely to harbor ants than soil would be. Ultimately, however, the ability of TxDOT to preclude potential for ants to be present in fill material used in the SH 45SW ROW is limited.

4.2.2.2 Collision Mortality

It is well established that animals suffer death and injury from collisions with motor vehicles (Federal Highway Administration 2008). In general, nearly all species of wildlife occurring on lands adjacent to SH 45SW would have potential to be killed or injured as a result of collisions with vehicles using the roadway. Collision mortality in general is not a limiting factor to most wildlife populations (Forman and Alexander 1998). Collision mortality rates do not necessarily correlate to traffic volume (high traffic volume can deter crossing attempts) but rates do correlate positively to vehicle speed (Case 1978, Conard and Gipson 2006, Smith-Patten and Patten 2008). Smith-Patten and Patten (2008) found lower rates of collision mortality on 4-lane roads than on 2-lane roads, and hypothesized that animals were less inclined to cross wider roads, perhaps because the roads reduced connectivity and so animals were more likely to have their home ranges contained entirely on one side of a 4-lane road than a 2-lane road.

Nearly any species of bird could be killed while attempting to fly across the road, although after construction it seems likely that smaller birds would mostly have territories on one side of the road or the other, so the probability of smaller birds being

struck by cars overall appears to be low. Vultures could be killed while eating carrion on the road, and hawks and owls could be killed while attempting to capture mice or other potential prey items detected on or adjacent to the road.

Adams and Geis (1983) found that rate of collision mortality for species of small mammals was directly proportional to their relative abundance in ROW habitat, but also that collision mortality did not appear detrimental to small mammal populations. Larger animals can be expected to have larger home ranges, and so would likely seek to cross the roadway on a more regular basis. Larger mammals expected to be relatively common on lands adjacent to the SH 45SW ROW and seemingly likely to suffer the highest rates of collision mortality include white-tailed deer, common raccoon, Virginia opossum, nine-banded armadillo, and striped skunk. Smith-Patten and Patten (2008) found that the latter four species accounted for approximately 85% (1,198 of 1,412) of all readily identifiable roadkill in a three-year study of the effects of season and road type on wildlife collision mortality conducted in Texas, Oklahoma, and Kansas. The authors reported the smallest animals identified were squirrels, suggesting their methodology (driving without stopping) likely prevented them from detecting the smallest animals. The smallest animals are also more likely to be removed from roads by scavengers and, thus, less likely to be detected during roadkill surveys (Gerow et al. 2010).

If a game fence is constructed around SH 45SW from Bear Creek to MoPac, it would reduce the chance for vehicle collisions with white-tailed deer, axis deer, and feral pigs on this section of the roadway. Clevenger et al. (2001) found that ungulate-vehicle collisions dropped 80% after roads were lined by wildlife exclusion fence. These species would be susceptible to collision on SH 45SW south of Bear Creek as would other mammal species, and it is conceivable that deer and pigs could occasionally reach the fenced segment of SH 45SW by breaching the fence, or by traveling on the roadway across the Bear Creek bridge from the south.

Mammals capable of climbing over or crossing through the game fence would be susceptible to vehicle collisions on SH 45SW north of Bear Creek. Much of this segment of the road would be constructed on fill and in those locations the travel lanes would be separated from grade level by retaining walls. This could serve to funnel mammals seeking to cross the road to those sections where the travel lanes were at grade. Because the fenced segment of SH 45SW is the same segment where eastbound and westbound travel lanes would be separated by concrete barriers, any mammals that were unable to pass through the barrier drainage slots or cross over the barriers could continue their attempts to cross the road by following the concrete barriers in hope of finding a way through. This would increase their time spent on the roadway and possibly lead them onto elevated sections of the roadway where the retaining wall could prevent or discourage them from leaving the road, seemingly all increasing the likelihood of these animals suffering collision mortality. However, Smith-Patten and Patten (2008) found little difference in collision mortality rates between divided and undivided roads.

Reptiles, particularly snakes and turtles, may seek to cross roads, and snakes will also use road edges for basking, increasing their time spent on roads and susceptibility to vehicle collision mortality (Andrews et al. 2006). Some species of snakes may be attracted to roadside edges because of greater prey availability, increasing their risk of suffering collision mortality (Andrews et al. 2006). Snakes on roads may also suffer from persecution, with people purposely running them over instead of trying to avoid them (Ashley et al. 2007). For these reasons, and because lands on either side of SH 45SW will largely remain undeveloped because they are owned by the City of Austin and so should be capable of supporting a diverse snake population, snake collision mortality would likely be a somewhat common event on SH 45SW during the warmer months of the year.

Lizards seemingly do not suffer greatly from vehicle collision mortality, perhaps because of their ability to cross roads quickly, or high site fidelity to small home ranges (Jochimsen et al. 2004). Thus, lizards are not expected to suffer high levels of mortality as a result of vehicle collisions. Aquatic turtles do not appear likely to suffer regular vehicle collision mortality on SH 45SW because these animals appear most likely to move across the SH 45SW corridor via Bear Creek, the channel of which would be unimpeded by roadway construction.

Leopard frogs are known to occur in the SH 45SW ROW, but their current distribution is likely highly localized given the overall upland nature of habitats in the ROW. Roadside ditches constructed as part of the roadway project could temporarily hold water following rainfall events, however, and these features could then serve to attract and hold amphibians close to the roadway. If so, susceptibility of leopard frogs to collision mortality on SH 45SW might be greater because of the presence of roadside ditches than it would be if those features were not included in the design plans. Treefrogs may be distributed more widely through the SH 45SW ROW, and also could be attracted to roadside ditches if holding water (Tipton et al. 2012). Some mortality of treefrogs could be expected as a result of construction of SH 45SW.

Toads are expected to occur more widely across the SH 45SW ROW. Toads were one of the most commonly encountered victims of collision mortality in a study conducted in an Arizona desert (Gerow et al. 2010), with frequency of toad mortality much higher following rainstorms during the monsoon season and often occurring at those times as mass mortality events. The use of PFC asphalt on SH 45SW would reduce the amount of water puddling on travel lanes compared to that expected from standard pavement, but it can be expected that toads will venture onto the roadway during periods of high activity following rainfall events as the search out prospective breeding sites (Andrews et al. 2006). As with frogs, the presence of roadside ditches could attract toads toward the roadway. Consequently, construction of SH 45SW is expected to result in vehicle collision deaths of toads, with mortalities having potential to be somewhat numerous subsequent to rainfall events occurring during toad breeding seasons. It is conceivable, therefore, that toad mortality as a result of vehicle collisions on SH 45SW could lead to localized reductions in toad populations (Fahrig et al. 1995).

4.2.2.3 Movement Barrier

Roads create barriers to animal movement, with road width and traffic volume the most important factors in the barrier effect (Forman and Alexander 1998). In general, small mammals and amphibians exhibit a low tendency to attempt to cross roads (Fahrig et al. 1995, Swihart and Slade 1984), so roads can create barriers to movement to these types of species.

Construction of SH 45SW would not create a complete barrier to movement by all wildlife since many species are expected to be able to successfully cross the road, and an open corridor to movement across the roadway would exist beneath the bridge over Bear Creek. However, populations of some smaller and less mobile animal species (e.g., some small mammals, lizards, toads, and frogs) on either side of the road may become effectively isolated from each other, with the roadway thus creating two smaller local populations of these species instead of their current one larger population. Smaller populations have a higher probability of extinction over time than do larger populations (Forman and Alexander 1998); however, because wildlife occurring in the SH 45SW is expected to be composed of species that occur commonly in the greater project region, it is considered highly doubtful that the division of any wildlife populations as a result of construction of SH 45SW would have any significant effect on the populations of those species at a regional scale.

Forman and Alexander (1998) caution that the barrier effect caused by roads may affect more species of wildlife and influence populations across a greater area, than the effects of collision mortality and road avoidance. The design of SH 45SW to the north of Bear Creek, with its proposed use of game fencing, concrete barriers between eastbound and westbound lanes, and elevated sections edged by retaining walls, appears likely to result in construction of a rather formidable barrier to wildlife movement. While not expected to significantly affect wildlife populations at a regional scale, this design could ultimately alter the local distribution and number of some less mobile reptile, amphibian, and small mammal species. Forman and Alexander (1998) conclude that designing roads to reduce their barrier effect makes good ecological sense. In the case of SH 45SW, barriers to wildlife dispersal were purposefully incorporated into the design. Game fencing is proposed for human safety considerations to reduce potential for vehicle collisions with deer and feral pigs. Construction of the road without a median, necessitating use of concrete barriers, and in some places on elevated strips of fill edged by retaining walls, is proposed as the result of a political decision to preferentially attempt to minimize the effect of road construction on a small number of species of invertebrates living deep underground in subterranean habitats.

4.2.2.4 Traffic Noise and Vehicular Activity

As summarized by Forman and Alexander (1998), many studies have been performed that show some species of birds and mammals occur in reduced densities in proximity to roads. Reasons suggested for this have included traffic noise, visual disturbance, presence of pollutants, and increased presence of predators (Forman and Alexander

1998). As mentioned above, numbers of some other species of animals can be expected to increase adjacent to roads. For birds that show sensitivity to presence of roads, the distance from roads out to which effects have been measured is greatest for grassland species. The blocking and dampening effects of trees may explain why effect distances are less for birds occurring in wooded communities. Effect distances have been shown to increase with increasing traffic volume.

Some have studied the effects of road noise on the endangered golden-cheeked warbler (Lackey et al. 2011, Pruett et al. 2014). We are not aware of any other studies that have investigated the effect of roads and road noise on wildlife in central Texas. Consequently, it is difficult to predict how construction of SH 45SW may affect wildlife species as a result of road avoidance behavior. Most bird species occurring in open habitats within the ROW can frequently be seen along roads, so it seems doubtful that populations of these species would be reduced adjacent to the roadway. Woodlands within and adjacent to the ROW are patchily distributed and so support few species of birds that are restricted in occurrence to "interior" woodland habitats. Consequently, birds are not expected to avoid open gaps resulting from construction of the road through wooded areas. Similarly, mammals known to occur or that may occur in the ROW appear reasonably likely to occur in proximity to roads. Thus, while construction of SH 45SW may cause some species to withdraw from habitat occurring immediately adjacent to the roadway, that number is likely not very great and given the comparatively short length of the road, is not likely to involve many individuals. Consequently, any impacts to wildlife caused by road avoidance behavior are expected to be minor.

4.3 THREATENED AND ENDANGERED SPECIES

4.3.1 Barton Springs / Austin Blind Salamanders

This section discusses the potential for construction and use of SH 45SW to adversely impact the federally endangered Barton Springs and Austin blind salamanders or adversely modify critical habitat that has been designated by the USFWS for the latter species. Neither salamander is known nor expected to occur within the ROW owing to an absence of spring habitat (SWCA and Cambrian 2014a). Austin blind salamander and even Barton Springs salamander (based on their presence in water at the bottom of Blowing Sink Cave) are considered to have some limited potential to occur in groundwater beneath the SH 45SW ROW, although neither species has been reported from aquatic habitat at the bottom of Flint Ridge Cave (Elliott 1997, Hauwert et al. 2011, Travis County and City of Austin 2011, 2012, 2013). Depth to groundwater locally is more than 150 feet (Elliott 1997, Texas Water Development Board 2014). For this reason, even if salamanders do occur in groundwater beneath the ROW, so much bedrock lies between the surface and the water table that it appears incredibly unlikely that construction of the road as designed could lead to the breaching of any subsurface void space that has potential to be occupied by salamanders (breaching of void space could potentially cause rocks to fall from a void ceiling and crush salamanders in the water below). Accordingly, no direct physical harm to any Barton Springs or Austin blind salamanders is expected from the performance of road construction activities or

afterward during use of the roadway. Consequently, this section is limited to a discussion of the potential effects to salamanders and designated critical habitat that could occur indirectly as a result of construction and use of the roadway.

4.3.1.1 Indirect Effects to Barton Springs and Austin Blind Salamanders

All sites known to be occupied by the Barton Springs salamander and the Austin blind salamander are outside the SH 45SW ROW. As a result, construction and use of SH 45SW could only adversely impact Barton Springs or Austin blind salamanders if those activities altered the quality or quantity of water in which the salamanders live and that alteration actually caused an adverse impact on salamanders.

Potential Changes to Water Quality

Construction of a road could result in a temporary increase in the amount of sediment being carried to the Edwards Aquifer if runoff from construction areas was not controlled. The potential for increased amounts of sediment escaping a road ROW would decrease greatly once the road surface was paved and vegetative cover was re-established in temporarily disturbed areas. Post-construction, the presence of a uncontrolled roadway in an aquifer recharge zone creates potential for groundwater quality to be chronically degraded as a result of surface water runoff being polluted by roadway contaminants, and temporarily degraded as a result of hazardous material spills. It is noted here that the recharge zone for the Barton Springs Segment of the Edwards Aquifer contains many miles of roads, both locally and state-owned. Thus, the construction of SH 45SW would not introduce a new condition to the recharge zone. Runoff from roads has contributed to recharge of the Barton Springs Segment for decades, and every road driven in the recharge zone, most of which are not provided with stormwater controls, carries potential for a spill of hazardous materials.

It is further observed that it seems highly probable that most vehicles that in the future would use SH 45SW would in absence of the roadway still be driven on roads across the recharge zone. Thus, while this section discusses control of pollutants expected to be contained in runoff from the proposed roadway, it appears logical to conclude that in absence of SH 45SW, most of the pollutants expected to be generated through the use of vehicles and attributable to SH 45SW would still be generated and carried by runoff off of roads in the recharge zone.

The TCEQ and USFWS through concurrence letters in 2007 adopted a set of voluntary Optional Enhanced Measures (OEMs) for avoiding water quality-related impacts to five federally listed aquatic species associated with the Edwards Aquifer. These species are the fountain darter, San Marcos gambusia, Barton Springs salamander, San Marcos salamander, and Georgetown salamander (*Eurycea naufragia*). Given the ecological similarities between the Austin blind salamander and the Barton Springs and San Marcos salamanders, it is assumed the USFWS would consider the OEMs effective in preventing development from causing impacts to Austin blind salamander as well.

The OEMs identify a broad menu of options to enhance water quality. The measures are divided into five categories starting with careful site planning where sensitive features such as caves, sinkholes, and springs are identified and planned around to the extent practicable. Temporary stormwater control measures must be employed during the construction phase to avoid and minimize disturbance of natural buffer areas and to reduce the generation and transportation of sediment and other contaminants. During and after the construction phase, permanent stormwater control measures must be employed to attain a water quality performance standard based on removal of at least 80 percent of TSS in stormwater from the total site area. After construction, additional stormwater control measures must be employed to avoid and minimize changes to stream morphology by controlling the rate and intensity of stormwater discharge. Finally, the OEMs include enhanced maintenance requirements of stormwater controls to ensure that they continue to function according to performance standards over time.

According to the USFWS/TCEQ concurrence letters, the proponents of projects that incorporate the OEMs into their plans do not need to consult with the USFWS regarding ESA compliance related to covered species unless their proposed project is located within 1 mile of springs occupied by the species. For comparative purposes, the SH 45SW ROW is located more than 1 mile away from Barton Springs, and more than 1 mile away from other sites recently identified as supporting Barton Springs salamander (Cold Springs, Spillar Ranch Spring, Taylor Springs, and Blowing Sink Cave).

Based on the concurrence, if the OEMs are implemented, the USFWS agrees that the project will not result in take of covered species as a result of water quality impacts. The OEMs were designed primarily for non-linear projects such as residential and commercial developments. It can be more difficult to apply the OEMs to linear projects such as highways where easement or ROW widths may be limited and not allow for inclusion of the types of stormwater controls required to meet the treatment standards achieved under the OEMs. The stormwater controls incorporated into the project BMPs do not meet the OEMs per se. However, the stormwater controls described in Section 3.0 were purposely designed to provide a higher level of water quality protection than that which would be expected to be achieved under minimum compliance with the OEMs, including generally more than 90% removal of TSS. Thus, construction and use of SH 45SW is not expected to result in significant degradation of water quality at Barton Springs or any other sites occupied by this species. A discussion of the level of pollutant removal expected from the stormwater control system proposed for SH 45SW is provided below.

The concentration of pollutants in highway runoff in the Austin area has been documented as the result of a TxDOT research program implemented to address the potential environmental impacts of the SH 45SW project.[13] Concentrations for various constituents have been reported by Barrett et al. (1996a, 1996b) and others. Concerns have been noted by some (e.g., see Li and Spillar 2014) regarding the lack of specific

[13] Results of a 4-year investigation of the quality of stormwater runoff from highway pavements in Austin, Texas are described in 1996 Center for Transportation Research Reports.

information about pollutant loads of constituents other than TSS. The reason that TSS removal has been highlighted over other constituents is to demonstrate compliance with the Edwards Aquifer protection regulatory requirement which uses TSS as a surrogate for particulate-associated pollutants. There is no applicable regulatory requirement to demonstrate removal of constituents besides TSS; therefore, no specific performance goals are described for pollutants other than TSS. However, information is presented herein that explains what constituents in highway runoff will be removed by permanent stormwater control measures.

The method used for calculating how much TSS will be removed before treated stormwater reaches a receiving stream follows the TCEQ guidance. The standard guidance as well as the OEM guidance uses the same method for calculating pollutant load (Equation 3.2 in TCEQ [2005]). Recharge zone stormwater control measures will be designed, constructed, operated and maintained to ensure that at least 90% of the incremental increase in the annual mass loading of TSS expected as a result of construction and use of SH 45SW is removed. TSS removal calculations were made based on the current roadway schematic. Ten water quality basins (stormwater drainage areas) were delineated for new pavement areas. Other water quality basins were defined for existing pavement areas where stormwater is treated by existing structures. The TSS load that would be removed was calculated based on the amount of pavement controlled by the combination of measures in each drainage area.

Based on the current design, the Rodriguez Transportation Group (RTG, 2014) has calculated that following construction, a total of approximately 86,865 pounds of TSS would be generated annually within the larger potential area of disturbance studied in the DEIS, with 30,633 of those pounds the result of existing project components (MoPac) negating the presence of five sand filtration systems located within the limits of the larger potential area of disturbance along MoPac. Based on an assumed 80% treatment efficiency, these five ponds would remove 12,451 pounds of TSS annually. When this TSS removal is factored into the natural background loads, the existing project is expected to generate 18,182 pounds of TSS annually (30,633 - 12,451 = 18,182). Of the 86,865 pounds of TSS generated by the project annually, 56,233 pounds would be directly attributable to the additional impervious cover. Of those 56,233 pounds of TSS generated by the project, 52,432 pounds would be generated on the recharge zone. Based on the Edwards Aquifer Rules, TxDOT is responsible only for 80% reduction in expected increases in load caused by its projects, not for reducing background loads.

Accordingly, the minimum project load required to be removed by the Edwards Aquifer Rules is 44,987 pounds of TSS annually (56,233 x 0.80 = 44,987). The more stringent goal of TxDOT to achieve 90% removal of TSS would require the removal of 50,610 pounds of TSS annually. RTG has calculated that the combined stormwater control measures for SH 45SW as designed are expected to remove 72,790 pounds of TSS annually. However, these 72,790 pounds of TSS include the existing 12,451 pounds currently being removed from the existing project by the five sand filtration systems. When these 12,451 pounds are factored out of the overall load removed, calculations indicate that 60,339 pounds will be removed by new stormwater control measures only.

This is approximately 107% of the amount of TSS for which the project would be responsible (60,339 / 56,233 x 100 = 107.3%). Thus, with treatment as proposed, the TSS load expected to leave the SH 45SW ROW annually would be approximately 14,075 pounds. This is 4,107 pounds less than the existing project load (18,182 – 14,075 = 4,107).

The load numbers provided above are based on total project area. For just that segment of SH 45SW that would occur on the recharge zone, annual natural background load as calculated by RTG is 24,071 pounds, not taking into account existing treatment. When the existing sand filtration ponds are accounted for, the existing project components are expected to generate 11,620 pounds of TSS annually. TxDOT would be required to reduce TSS based on the expected additional increase of 52,432 pounds. As calculated by RTG, new stormwater control measures as designed would remove approximately 54,955 pounds of TSS on the recharge zone. Thus, the new stormwater controls are expected to annually remove the full TSS load expected to be generated on the recharge zone, plus an additional 2,523 pounds generated by existing project components (approximately 105% of the additional increase in TSS).

A recent presentation on City of Austin data regarding water quality trends at Barton Springs provides confidence regarding the effectiveness of existing water quality controls.[14] In this presentation, representative constituents were selected for discussion that are commonly observed in highway runoff, including solids, heavy metals, and nutrients. TSS was selected as the constituent to represent solids in spring discharge. Suspended solids and settled sediments are both factors cited by USFWS as listing considerations for the Austin blind salamander (USFWS 2013). Monitoring of water discharging at Barton Springs for the period of record (1993 to 2013) indicates that TSS concentrations are declining. Zinc was selected as the constituent to represent metals because it is always found in highway runoff owing to its use in tire manufacturing. Observations for the period of record show a slight decreasing trend in concentrations of zinc. This decrease was considered to be an artifact attributable to lowered detection limits, with zinc concentrations considered to be stable. No zinc concentrations above the laboratory quantification limit have been observed in over eight years. Concentrations of nitrate have increased through time, but observed increases were attributed to wastewater discharges from animal and human sources (i.e. pet waste, septic drain fields, permitted land application sites). Concentrations of nitrate in stormwater runoff were not believed responsible for the observed increases in nitrate because effluent values from treated stormwater were not large enough to trigger the increases. A key conclusion in the presentation was that stormwater controls required by various regulations have been effective in stabilizing concentrations of pollutant constituents occurring in highway runoff, or that the water quality at Barton Springs has remained essentially constant despite the population growth across the Barton Springs watershed.

[14] *Effectiveness of Stormwater Regulations in the Barton Springs Zone*: Presentation given by Dr. Michael Barrett to the Capital Area Erosion Control Network on 23 October 2014.

In addition to the stormwater controls included with the SH 45SW design, the Edwards Aquifer itself provides potential for dilution and natural treatment of pollutants in groundwater. Stormwater reaching the aquifer from the SH 45SW ROW post-treatment would be diluted heavily by water within the aquifer. The SH 45SW ROW as treated herein is approximately 179.68 acres in size. The recharge zone for the Barton Springs Segment of the Edwards Aquifer is approximately 90 square miles and its contributing zone encompasses another 264 square miles (USFWS 1997). Thus, the ROW represents approximately 0.31% of the total recharge area and no more than approximately 0.08% of the total Barton Springs watershed. These tiny percentages indicate that water reaching the aquifer from the ROW can be expected to be heavily diluted by water reaching the aquifer from other sources.

The aquifer can also be expected to serve as a settling basin, and, just as it does to form caves, water within the aquifer can be expected to dissolve fine carbonate particulate matter (Eckhart 2013). Water recharging the aquifer from the general vicinity of the SH 45SW ROW can reach Barton Springs in 2 days or less (Hauwert 2012), suggesting that under certain (higher) flow regimes finer particulate matter reaching the aquifer from the SH 45SW ROW would have limited ability to settle to the bottom of the aquifer or be dissolved before the water carrying that sediment reaches Barton Springs. However, at times of lower, slower flow, the aquifer may act to preclude TSS escaping treatment in the SH 45SW ROW from reaching Barton Springs.

Based on the stormwater controls incorporated into the project design and their exceeding the water quality standards attained through minimal compliance with the OEMs, the dilution afforded by water within the aquifer, and the added ability of the aquifer to provide water treatment, any change in the quality of water discharging at Barton Springs resulting from construction and use of SH 45SW is not expected to adversely impact the Barton Springs or Austin blind salamanders. This finding is in accordance with and pursuant to the concurrence letters exchanged between the USFWS and TCEQ.

Potential Changes to Water Quantity

Construction of SH 45SW would result in the introduction of approximately 52.44 acres of impervious cover to the recharge zone for the Barton Springs Segment of the Edwards Aquifer. As indicated, the recharge zone for the Barton Springs Segment covers approximately 98 square miles. The loss of 52.44 acres of the recharge zone to construction of SH 45SW thus represents an approximately 0.09% decrease in the amount of land within the recharge zone available to allow water to percolate through the ground and provide recharge to the aquifer.

The geologic assessment resulted in the identification of 16 sensitive upland recharge features (plus a 17th feature located in the Bear Creek channel), exclusive of Flint Ridge Cave (SWCA and Cambrian Environmental 2014a). Table 10 lists each of the 16 sensitive upland recharge features identified during the geologic assessment along with Flint Ridge Cave and identifies the impact to the surface drainage area of each feature expected from construction of SH 45SW. As indicated in Table 10, SH 45SW as

designed avoids the surface drainage area of most features. Figures showing the surface drainage area for each feature and how they are accommodated in construction plans are provided in Appendix B.

Table 10. Expected Impact to Sensitive Upland Recharge Features

Geologic Assessment Feature No.	Expected Impact
F-16	None; located outside of the ROW; surface drainage area unaffected
F-18 (Cow Pattie Cave)	None; surface drainage area unaffected.
F-23 (Hat Sink)	Surface drainage area reduced by 0.16 acre; surface drainage area modified to maintain current acreage; flow to feature maintained with bottomless culvert.
F-29b, F-29c, F-29d	None; surface drainage area unaffected
F-41	None; Surface drainage area unaffected
F-55	Surface drainage area modified to maintain current acreage; bottomless culvert to be used to preserve flow to feature.
F-62a	None; located outside of the ROW; surface drainage area unaffected
F-64	None; surface drainage area unaffected
F-65	None; surface drainage area unaffected
F-110 (Jubilee Cave)	None; surface drainage area unaffected
F-157a (SH 45 Cave)	None; outside SH 45SW ROW; surface drainage area unaffected
F-161	None; surface drainage area unaffected
F-163	None; surface drainage area unaffected
F-170 (MoPac Sink)	None; surface drainage area unaffected
Flint Ridge Cave	Surface drainage area modified to maintain current area

Construction of SH 45SW as proposed would cover approximately 0.71 acre of the Flint Ridge Cave surface drainage basin. The amount of water reaching Flint Ridge Cave would be maintained by altering the contours of another 0.71 acre of adjacent land so that it drains toward Flint Ridge Cave. While this would maintain the volume of water draining into Flint Ridge Cave, the total action would still result in an overall 0.71-acre net loss of total recharge area. This loss is considered to be insignificant from a recharge standpoint given the findings of Wilding (2005), which indicate that the amount of water recharging diffusely through the soil in the vicinity of Flint Ridge Cave is negligible.

The introduction of impervious cover to a recharge zone does not necessarily mean the volume of water recharging an aquifer would decrease in response. As identified, a large percentage of the precipitation falling on vegetated land is lost to evapotranspiration and local clay soils act as a “cap” that largely prevent water from reaching the aquifer through diffuse infiltration (Wildling 2005). Most precipitation falling onto an impervious surface runs off that surface and retains potential to provide aquifer recharge (while also retaining potential to be lost to evapotranspiration). In the case of SH 45SW, runoff from the roadway would drain into and be treated by series of permanent stormwater controls before infiltrating the ground or being released into

receiving drainages.[15] In the event of especially heavy rainfall events (> 4 inches), some stormwater, after passing through the PFC overlay and across vegetated filter strips and through grassy swales, could bypass other stormwater controls.

A water budget for the Barton Springs Segment computed by Slade et al. (1986) and Woodruff (1984) indicates that, on average, approximately 6% of precipitation provides recharge to the aquifer, with 85% lost to evapotranspiration and 9% lost to runoff (water carried by creeks downstream of the recharge zone). For the purposes of this assessment, it will be assumed that water lost to runoff originates as creek flow from outside of the ROW since the ROW away from Bear Creek is mostly flat and precipitation is largely expected to be captured on-site by plants, soil, and aquifer recharge features. However, instead of assuming that 15% of precipitation falling in the ROW is thus available to recharge the aquifer, it will be assumed that 9.3% to 11.8% of precipitation is available for aquifer recharge based on the 88.2% to 90.7% loss to evapotranspiration suggested by the results of the Hauwert (2005) study of recharge to Flint Ridge Cave. Based on these rates of loss, the average amount of recharge that could be expected annually from the 52.44 acres in absence of impervious cover is approximately 13.1 to 16.6 acre-feet. This represents approximately 0.034% to 0.043% of the average annual discharge at Barton Springs. Thus, as a worst-case scenario, if it is assumed that none of the water falling on the impervious surfaces associated with SH 45SW was subsequently able to infiltrate the aquifer and that all water recharging the aquifer from the ROW discharges at Barton Springs, then annual discharge at Barton Springs might on average be reduced to 99.955% to 99.965% of its current volume as a result of construction of the roadway.[16]

In a more realistic scenario, approximately 90% of water falling on the impervious surfaces can be expected to drain to the stormwater controls (TCEQ 2005). This means that, on average, approximately 126.4 acre-feet of water per year can be expected to drain into stormwater controls from the impervious surfaces of the SH 45SW roadway.[17] A minor, unknowable amount of this 126.4 acre-feet would be lost to evaporation while being detained in the controls, but much of the original volume would be available to recharge the aquifer after being discharged following treatment. This is a much greater volume than the 13.1 to 16.6 acre-feet expected to recharge the aquifer annually from the 52.44 acres that would be covered by impervious surfaces.

It cannot be calculated exactly how much of the approximately 126.4 acre-feet of water that is expected to drain off the impervious surfaces of SH 45SW per year on average would ultimately provide recharge to the aquifer. Water could infiltrate the ground while

[15] Water leaving impervious surface could infiltrate the ground while being treated by vegetative filter strips and grassy swales. Water held in detention ponds could recharge the aquifer upon release into receiving drainages.

[16] Average annual discharge at Barton Springs is 36,947.6 acre-feet. (36,947.6 – 13.1) ÷ 36,947.6 = 0.99965 and (36,947.6 – 16.6) ÷ 36,947.6 = 0.99955.

[17] 52.44 ac. x (32.15 in. rainfall/yr. x 1 ft./12 in.) x 0.9 (runoff coefficient) = 126.446 acre-feet.

passing across vegetative filter strips and grassy swales, and would be discharged from ponds to drainage channels, reducing opportunities for loss to evapotranspiration and improving chances of the water reaching the aquifer. While the actual net change in volume of water expected to recharge the aquifer from the Project Area following construction of SH 45SW cannot be determined, given the much greater availability of water expected as a result of the introduction of impervious cover, it is considered highly probable the net change would be positive, representing a slight percentage increase in total amount of water recharging the Barton Springs Segment.[18]

As described, approximately 75% to 85% of recharge to the Barton Springs Segment occurs within creek channels. SH 45SW would span Bear Creek via a bridge, so construction of SH 45SW would not decrease the amount of water reaching the Barton Springs Segment via the Bear Creek channel. Recharge occurring in upland areas throughout the recharge zone is expected to contribute most of the remaining 15% to 25% of aquifer recharge. Recharge occurring in upland areas results from a combination of direct percolation through the ground and surface drainage of runoff through recharge features such as caves and sinkholes. With regard to SH 45SW, it is expected that very little water reaches the aquifer via direct percolation through the ground within the ROW owing to the comparatively thick covering of clayey terra rossa soils. Instead, these comparatively impervious soils should promote surface water runoff within the ROW toward drainage channels (including Bear Creek) and toward upland recharge features such as those identified in Section 2.1.2.1.

Based on the very small percentage change in the amount of water expected to be available to recharge the aquifer as a result of construction of SH 45SW, flow rates at Barton Springs are expected to nearly identical to those expected in absence of the roadway. Consequently, no adverse impacts to the Barton Springs salamander or Austin blind salamander are expected as a result of changes in the quantity of water discharging at Barton Springs attributable to construction of SH 45SW.

4.3.1.2 Indirect Effects to Designated Critical Habitat for the Austin Blind Salamander

The USFWS designated critical habitat for the Austin blind salamander in 2013 (USFWS 2013). Section 7(a)(2) of the Endangered Species Act prohibits the "destruction or adverse modification" of designated critical habitat by any action authorized, funded, or carried out by a federal agency. These regulations define "destruction or adverse modification" as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species." It is noted here that, as a non-Federal project, construction of SH 45SW by TxDOT and the CTRMA is not subject to the adverse modification prohibition.

[18] Even if all of the average 126.4 acre-feet of water expected to drain off the impervious surfaces of SH 45SW per year provided recharge to the aquifer, the net increase of 109.8 – 113.3 acre-feet of recharge over that expected in absence of the impervious cover (13.1 – 16.6 acre-feet) could provide at most an approximately 0.04% increase in average discharge at Barton Springs.

Nonetheless, in support of conservation of the species, the potential for construction and use of SH 45SW to adversely modify designated critical habitat for the Austin blind salamander is examined herein. Because all designated critical habitat is located in proximity to Barton Springs, construction of the roadway does not carry potential to destroy critical habitat.

The habitat components, or primary constituent elements (PCEs), used by the USFWS (2013) to delineate critical habitat for the Austin blind salamander in the final rule are as follows:

Surface Habitat PCEs extending 80 meters or 262 feet from a spring outlet or cave

- Water from the Barton Springs Segment of the Edwards Aquifer. The groundwater is similar to natural aquifer conditions as it discharges from natural spring outlets. Concentrations of water quality constituents and contaminants should be below levels that could exert direct lethal or sublethal effects (such as effects to reproduction, growth, development, or metabolic processes), or indirect effects (such as effects to the Austin blind salamander's prey base). Hydrologic regimes similar to the historical pattern of the specific sites are present, with constant surface flow. The water chemistry is similar to natural aquifer conditions, with temperatures from 67.8 to 72.3 °F, dissolved oxygen concentrations from 5 to 7 mg L^{-1}, and specific water conductance from 605 to 740 [micro]S cm^{-1}.
- Rocky substrate with interstitial spaces. Rocks in the substrate of the salamander's surface aquatic habitat are large enough to provide salamanders with cover, shelter, and foraging habitat (larger than 2.5 in (64 mm)). The substrate and interstitial spaces have minimal sedimentation.
- Aquatic invertebrates for food. The spring environment supports a diverse aquatic invertebrate community that includes crustaceans, insects, and flatworms.
- Subterranean aquifer. Access to the subsurface water table should exist to provide shelter, protection, and space for reproduction. This access can occur in the form of large conduits that carry water to the spring outlet or fissures in the bedrock.

Subsurface Habitat PCEs occurring within 300 meters or 984 feet of a spring outlet or cave

- Water from the Barton Springs Segment of the Edwards Aquifer. The groundwater is similar to natural aquifer conditions. Concentrations of water quality constituents and contaminants are below levels that could exert direct lethal or sublethal effects (such as effects to reproduction, growth, development, or metabolic processes), or indirect effects (such as effects to the Austin blind salamander's prey base). Hydrologic regimes similar to the historical pattern of the specific sites are present, with continuous flow in the subterranean habitat. The water chemistry is similar to natural aquifer

conditions, including temperature, dissolved oxygen, and specific water conductance.

- Subsurface spaces. Conduits underground are large enough to provide salamanders with cover, shelter, and foraging habitat.
- Aquatic invertebrates for food. The habitat supports an aquatic invertebrate community that includes crustaceans, insects, or flatworms.

As described in Section 3.0, the proposed project will incorporate state-of-the-art stormwater controls and water quality BMPs intended to avoid and minimize impacts to water quality and the Edwards Aquifer. The water quality performance standard would exceed the threshold for avoiding water quality impacts to *Eurycea* spp. that has been previously recognized by the USFWS and TCEQ through their adoption of the OEMs. Further, as discussed in the previous section, construction of the roadway is expected to have a negligible impact on the volume of water discharging at Barton Springs. Consequently, it can be expected that the quality and quantity of water discharging at Barton Springs would remain at levels suitable for sustaining Austin blind salamanders and their prey base. For these reasons, construction of SH 45SW does not appear to create potential to adversely modify the critical habitat that has been designated for the Austin blind salamander.

4.3.1.3 Cumulative Impacts

Construction of SH 45SW would contribute to the amount of impervious cover present within the Barton Springs watershed. However, because of the stormwater controls and water quality BMPs included in the design of the roadway, the construction and use of SH 45SW is not expected to result in any direct or indirect adverse impacts to the Barton Springs salamander or Austin blind salamander. Therefore, construction of the roadway would not contribute to the impacts these species have experienced or are expected to experience, as a result of past, present, and future actions within the Barton Springs watershed.

4.3.2 Golden-cheeked Warbler

This section summarizes the findings of SWCA (2014) with regard to the potential for construction and use of SH 45SW to adversely impact the golden-cheeked warbler. No golden-cheeked warblers were detected in or adjacent to the ROW during surveys conducted in the spring of 2014, so the impact discussion is presented in light of the possibility that golden-cheeked warblers could again occur in general proximity to the SH 45SW ROW.

4.3.2.1 Direct Effects

Clearing of vegetation in advance of road construction could result in death or injury of golden-cheeked warblers if active nests were present in a ROW when the activity occurred. It is also possible that if clearing were to occur directly adjacent to a physically undisturbed tree containing an active nest, the abrupt loss of proximate woodland could cause the adult warblers to abandon the nest, leading to loss of eggs or starvation of

nestlings. Because the golden-cheeked warbler is migratory, however, the potential for vegetation clearing activities to directly impact individual golden-cheeked warblers can be avoided altogether by performing those activities during the time of year when the birds are outside of the United States. Whenever the clearing of the SH 45SW ROW is performed in advance of roadway construction, TxDOT would be careful to perform that activity outside of the golden-cheeked warbler breeding season. Consequently, under no circumstance is it expected that any golden-cheeked warblers would be killed or injured as a result of vegetation clearing activities within the SH 45SW ROW.

While it is known that ROW vegetation clearing activities would be performed outside of the golden-cheeked warbler breeding season, at this time it is not known when in the year actual road construction activities would start after the ROW was cleared. Given the results of past surveys on adjacent City of Austin properties, it is possible, though not likely, that golden-cheeked warblers could be nesting in woodlands adjacent to the SH 45SW ROW while road construction activities were being performed. Studies performed on the possible effects of road construction on golden-cheeked warblers have demonstrated that road construction noise and activity have no effect on golden-cheeked warbler pairing success, territory placement, or productivity (Lackey et al. 2011, Pruett et al. 2014). Consequently, if warblers were nesting in woodland adjacent to the ROW while road construction was being performed, the noise and activity associated with construction would not be expected to affect the success of the nesting activity.

Because vegetation clearing activities within the SH 45SW ROW are expected to be performed outside of the golden-cheeked warbler breeding season and because studies have shown that road construction noise and activity do not affect golden-cheeked warbler pairing success or productivity, no direct impacts to golden-cheeked warblers are expected as a result of construction of SH 45SW.

4.3.2.2 Indirect Effects

In general, the clearing for construction of a road in a new location adjacent to or through habitat regularly utilized by golden-cheeked warblers has the potential to cause the following indirect effects to the species:

- **Habitat loss --** The clearing of warbler habitat from a road ROW can result in displacement of birds from previously occupied areas and a reduction in overall habitat carrying capacity, which over time, depending on the scale of the clearing, could result in a reduction in local warbler populations. This potential indirect impact does not apply to the SH 45SW project because no evidence suggests that any habitat used by golden-cheeked warblers is present in the SH 45SW ROW, so none would be lost to road construction.
- **Reduction in habitat patch size** – The incomplete cutting of a patch of habitat results in a reduction in the size of that patch. Depending on the amount of habitat cut and the original patch size, the cutting of that habitat may have no effect on the status of warblers in the patch, or it could result in partial or complete displacement of birds from the remaining habitat owing to minimum

patch size requirements. This potential indirect impact also does not apply to the SH 45SW project, again because no evidence suggests that any habitat used by golden-cheeked warblers is present in the SH 45SW ROW, so no reduction in habitat would occur.

- **Habitat fragmentation** – The incomplete cutting of a patch of habitat can sometimes cause remaining habitat to be distributed amongst multiple isolated smaller patches of habitat. This can be a concern for less mobile species, but it is not a major concern for golden-cheeked warblers because they can easily cross gaps between habitat patches. Regardless, this potential indirect impact also does not apply to the SH 45SW project because no habitat would be expected to be fragmented by clearing of the highway ROW.
- **Increase in predation rates** –The cutting of woodland habitat can create a sharp division or edge between remaining woodland and newly opened areas. Boundaries between sharply contrasting habitat types are referred to as habitat edges. Golden-cheeked warblers will occur at both the edge and in the interior of woodlands. Peak (2007) found that golden-cheeked warblers suffer lower nest success rates close to woodland edges as a result of increased nest depredation rates, with most losses caused by snakes. Clearing of the SH 45SW ROW would create new woodland edges in some locations, but not in any location where golden-cheeked warblers have occurred on City of Austin lands in the past in general proximity to the ROW. This is because woodlands where warblers have occurred on City of Austin lands are separated from woodlands in the SH 45SW ROW by a cleared, grassy transmission line easement that ranges from approximately 50 to 100 feet wide. Therefore, for locations where golden-cheeked warblers have occurred in the past, construction of SH 45SW is not expected to alter the ability of predators to access the adjacent woodlands. In fact, traffic on SH 45SW might result in an overall decrease in snakes in the area as a result of vehicle collision mortality.
- **Increase in cowbird parasitism rates** – Similar to the impact discussed immediately above, the cutting of woodland habitat can result in increased rates of golden-cheeked warbler nest parasitism by brown-headed cowbirds. Cowbirds prefer open habitats and, as a result of greater accessibility, cowbird nest parasitism rates are greater along woodland edges than they are in woodland interiors (Brittingham and Temple 1983). As discussed directly above, the clearing of the SH 45SW ROW would not create new woodland edges in proximity to locations where golden-cheeked warblers have occurred previously on lands owned by the City of Austin. Consequently, construction of the highway is not expected to alter local cowbird nest parasitism rates on golden-cheeked warblers.
- **Change in woodland structure and species composition –** The cutting of woodland habitat can result in alteration of the species composition and structure of remaining woodland along newly created woodland perimeters as a result of changes in light exposure, air temperature, soil moisture, and humidity (Gehlhausen et al. 2000). Removal of tree canopy allows more sunlight to reach the ground, which in turn promotes the growth of shrubby understory species and

in some cases can allow exotic tree species to invade the woodland. This type of effect is usually realized only at the woodland perimeter. The actual effect that this type of alteration can have on golden-cheeked warblers if not involving invasion by exotic species is probably minor given that their woodland habitat often has a partially open canopy (Campbell 2003) and so is typically subjected to more exposure than true closed canopy forest. With regard to SH 45SW, clearing of the ROW is expected to have a negligible effect on vegetation community structure on either side of the ROW, both because woodlands present in the area mostly have a semi-open canopy and are patchily distributed amongst more open rangeland communities, and because the adjacent transmission line easement has already created a cleared edge along sides of the ROW.

Golden-cheeked warblers occupy woodlands adjacent to roadways throughout their breeding range. SWCA has observed the species directly adjacent to roads of all types and traffic loads, including at two different locations within the median of Interstate Highway 10 (SWCA 2012). Therefore, it is not inconceivable that after completion of SH 45SW, one or more warblers would over time choose to establish a territory in general proximity to the highway ROW. But, the studies performed by Lackey et al. (2011) and Pruett et al. (2014) indicate that noise generated by post-construction use of SH 45SW should not be expected to impair the ability of any golden-cheeked warblers to find mates or successfully raise young, should they choose to settle in proximity to the completed highway. Thus, based on all of the above, no indirect impacts to golden-cheeked warblers would be expected to result from construction and use of SH 45SW.

4.3.2.3 Future Use of Woodlands on City of Austin Lands by Golden-cheeked Warblers

Because SWCA was asked by TxDOT to examine how construction of SH 45SW could impact the golden-cheeked warbler, in addition to examining the potential for road construction to directly and indirectly impact individuals of the species, SWCA investigated how construction of the highway might influence future use of woodlands on nearby City of Austin lands. Surveys performed to date indicate that golden-cheeked warblers occur irregularly in woodlands on either side of the SH 45SW ROW, and more frequently to the west of the ROW than to the east. Warblers have been found to occupy a City of Austin property directly east of the ROW to the south of Bear Creek in 1 out of 7 (14.3%) years that the property has been surveyed. On City of Austin properties to the west of the ROW, warblers have been found in one location in 4 out of 7 (57.1%) years of survey and in another location in 2 out of 7 (28.6%) years of survey.

Magness et al. (2006) showed that the amount of woodland present on the landscape influences usage of that woodland by golden-cheeked warblers. They found that golden-cheeked warblers occurred in a patch of woodland only when landscape composition within a 1,312-foot (400-m) radius of the patch exceeded 40% woodland, and that the likelihood of occupancy was greater than 50% only when landscape composition exceeded 80% woodland.

While clearing of the SH 45SW ROW is not expected to result in the loss of any woodland known to be used by golden-cheeked warblers, it would reduce the total amount of woodland present on the local landscape. If that reduction caused the total amount of woodland present on the local landscape to drop below the 40% threshold shown by Magness et al. (2006) as necessary for warbler occurrence, then construction of SH 45SW could influence the future rate at which woodlands on nearby City of Austin lands are used by golden-cheeked warblers.

To examine the effect that clearing of woodland from the SH 45SW ROW might have on future usage of nearby woodlands by golden-cheeked warblers, SWCA used ArcGIS software and recent publicly available digital aerial photography (National Agriculture Imagery Program 2012) to delineate all woodland within 1,000 meters of the boundaries of the SH 45SW ROW. A system of grid points with a 10-meter spacing was established across the SH 45SW ROW and on all lands occurring within 600 meters of the ROW, and ArcGIS software was used to quantify the amount of woodland present on the landscape within 400 meters of each of those points (a 400-meter radius circle is hereafter referred to as the *local landscape*). The amount of woodland present on the local landscape was expressed as a percentage of the total area of a 400-meter radius circle. From that, a contour map was produced depicting the amount of woodland cover present on the local landscape at all points occurring in and within 600 meters of the SH 45SW ROW.

ArcGIS software was then used to simulate the removal of all woodland from the SH 45SW ROW and the calculations were repeated at each grid point to create a second contour map in order to illustrate how clearing of the ROW would affect the amount of woodland cover present on the local landscape if the SH 45SW ROW was cleared in full. The results of these calculations are depicted on Figure 4. Included on Figure 4 are locations of golden-cheeked warbler observations made on City of Austin properties by SWCA in 2013 (SWCA 2013). For ease of reference, the contours on Figure 4 were collapsed to depict local landscape woodland cover in three classes: 1) less than 40% (golden-cheeked warblers not expected to occur); 2) 40% to 80% (golden-cheeked warblers could occur); and 3) greater than 80% (better than a 50% chance that golden-cheeked warblers would occur). Note that not all woodland is expected to be removed from the SH 45SW ROW, but full removal was simulated as a worst-case scenario.

As shown on Figure 4, fitting rather neatly with the findings of Magness et al. (2006), golden-cheeked warblers in 2013 occurred in the only sizable areas where woodland cover exceeds 80% on the local landscape. The precise location of warblers within those areas is likely tied to the distribution of deciduous trees. In all three locations, ephemeral tributaries lead down to Bear Creek, with these drainages supporting elevated abundance of deciduous trees compared to woodland present elsewhere in the Bear Creek corridor.

Figure 4. Pre- and post-construction levels of woodland cover on the local landscape surrounding the SH 45SW ROW.

As also shown on Figure 4, the clearing of the SH 45SW ROW would cause percent woodland cover to drop below 80% to the east of the ROW where a pair of golden-cheeked warblers occurred in 2013. No warblers had been detected occupying this property during surveys conducted in 2000, 2002, 2003, 2009, or 2010, and surveys conducted in 2014 indicated the birds did not return to this location (SWCA 2014). The change in woodland cover on the local landscape expected from the clearing of the SH 45SW ROW suggests that following road construction, future use of the woodland on the property to the east by golden-cheeked warblers would still remain possible because woodland cover would still exceed the minimum 40% shown by Magness et al. (2006) as necessary for warbler occurrence. While clearing of the ROW seemingly would cause the chance for future warbler occurrence on this property to drop below 50%, surveys performed to date have found that warblers have occupied the property only 14.3% of the time (1 out of 7 years of survey). Thus, it does not appear particularly meaningful that the clearing of the ROW would cause the chance for warbler occurrence on the Bliss Spillar property to drop below 50% because that seems to be the current condition.

Less woodland to the west of the SH 45SW ROW would be set in a local landscape with woodland cover exceeding 80% following the clearing of the ROW. However, percent woodland cover on the local landscape at locations where golden-cheeked warblers have occurred would not change much, especially at the northerly location where warblers have occurred more often (4 out of 7 surveys compared to 2 out of 7 surveys at the southerly location). Because a rather extensive amount of woodland set in a landscape with greater than 80% woodland cover would remain on property to the west following the clearing of the ROW, it is expected that golden-cheeked warblers would continue to occur at those same locations on an irregular basis as they currently do.

4.3.2.4 Summary

No golden-cheeked warblers were detected in or adjacent to the SH 45SW ROW in the spring of 2014 during a survey conducted in accordance with USFWS presence/absence survey protocols. Surveys conducted on nearby City of Austin Water Quality Protection Lands indicate that golden-cheeked warblers in some years occur in woodlands on either side of the ROW. Warblers have occurred very infrequently (1 out of 7 years) to the east of the ROW, and with greater frequency to the west of the ROW (2 out of 7 years at one location and 4 out of 7 years at another location). It is believed most likely that location of the ROW and City of Austin properties at the eastern edge of the range of the warbler and conspecific attraction act to preclude warblers from occurring in these locations with greater regularity.

The clearing of the SH 45SW ROW would not cause the direct loss of any woodland known to be used by golden-cheeked warblers. The clearing also would not fragment or reduce the size of any warbler habitat occurring on City of Austin properties adjacent to the ROW. Clearing performed by LCRA for construction of a transmission line has already created a cleared edge along the woodland to the east and west of the SH 45SW ROW that is contiguous with the woodland in which golden-cheeked warblers

have occurred, so clearing of the SH 45SW ROW also would not subject these patches of woodland to deleterious edge effects.

Clearing of the SH 45SW ROW would reduce the total amount of woodland present on the landscape within 400 meters of locations where golden-cheeked warblers have occurred on City of Austin properties. Magness et al. (2006) showed that total amount of woodland on the landscape was a determining factor in whether or not warblers would occur in a particular patch of woodland. Following clearing, all woodland on City of Austin properties where golden-cheeked warblers have occurred in the past would remain set in landscapes with woodland cover greater than the 40% minimum shown by Magness et al. (2006) as necessary for warbler occurrence. The amount of woodland present within 400 meters of woodland on City of Austin property east of the ROW would drop below 80% after clearing of the SH 45SW ROW. This suggests the chance for future occurrence of warblers on this property would drop below 50%. However, golden-cheeked warblers have been found on this property only 14.3% of the time (1 out of 7 surveys), suggesting that the chance for warblers to occur on this property is already well below 50%. Therefore, the reduction in the amount of woodland cover present on the landscape as a result of clearing of the SH 45SW ROW is not expected to alter the frequency at which golden-cheeked warblers occur on City of Austin Water Quality Protection Lands.

It is expected that TxDOT would clear the SH 45SW ROW and initiate construction activities outside of the golden-cheeked warbler survey season. Studies have shown that road construction noise and road noise have no effect on golden-cheeked warbler pairing success, territory placement, or productivity (Lackey et al. 2011, Pruett et al. 2014). Consequently, should a golden-cheeked warbler choose to establish a territory in proximity to the SH 45SW ROW while road construction was underway, or after the road was built and opened for use, the ability of that warbler to attract a mate or successfully raise young is not expected to be impaired as a result of noise and activity associated with construction or use of the road.

Accordingly, for the reasons discussed in this evaluation as summarized above, the construction and use of SH 45SW is not expected to cause any significant adverse impacts to the golden-cheeked warbler.

4.3.2.5 Cumulative Impacts

No direct or indirect impacts to the golden-cheeked warbler are expected as a result of construction of SH 45SW. Therefore, construction of the roadway would not contribute to the impacts this species has experienced or is expected to experience, as a result of past, present, and future actions.

4.4 FLINT RIDGE CAVE

The potential effect of construction and use of SH 45SW on the ecological integrity of Flint Ridge Cave was examined on behalf of TxDOT by SWCA/Cambrian Environmental (2014b). As indicated in Section 2.1.2.2, Flint Ridge Cave was identified for protection in

the BCCP and is known to support two non-listed species covered by the BCCP, Bandit Cave spider and *Rhadine austinica*.

Karst systems rely on the input of nutrients from surface systems. Nutrients can be washed into caves as detritus by surface water runoff, provided by plant roots that breach cave ceilings, or introduced to caves by animals that travel between karst and surface systems (such animals are known as trogloxenes). An example of a trogloxene is the cave cricket (*Ceuthophilis* spp.). Cave crickets forage on the surface at night and take shelter in caves (and in other dark places) during the day. Cave cricket eggs, feces, and shed or lost body parts can be important sources of nutrients for some karst systems. Nutrient availability is typically poor in karst systems, especially with increasing distance from cave openings. As a result, strictly troglobitic species are typically solitary and usually occur in low to extremely low densities (Mitchell and Reddell 1971, Culver 1982). On the other hand, species that take shelter in caves but forage on the surface can sometimes occur abundantly in caves (e.g., cave crickets and some bats).

Actions that impact karst habitat typically alter the stable physical environment of the cave, alter nutrient input, or introduce substances and/or organisms that have the potential to adversely affect karst invertebrate species. Some of the more common types of impacts to caves and karst habitat include:

- The filling or collapsing of cave entrances. Covering cave entrances can alter the physical cave environment, as well as impede or eliminate nutrient input.

- Chemical contamination of habitat from ground water and/or surface drainages, including introduction of pesticides, fertilizers, sewage, hazardous materials from spills, various pipeline leaks, storage tanker leaks, landfills, and urban run-off. Trash dumping also may be a source of chemical contamination.

- Alteration of surface drainage patterns via alterations in topography, impervious cover, etc. that lead to drying of karst features and changes in rate of nutrient inputs.

- Loss, alteration, or disturbance of surface plant and animal communities that significantly alter the rate of nutrient input, alter the stable physical environment of the cave, or introduce harmful organisms. Changes in surface plant communities may result in negative alteration of the rate and quality of nutrient input into the cave system. Moreover, changes in surface plant species composition can in turn alter the structure of the surface animal community. Alteration in the structure of the animal community, if it caused a decrease in the number of trogloxenes using a cave, could negatively affect the rate of nutrient input into that feature. Loss of vegetative cover (replaced with impervious cover, left as bare ground, etc.), if extensive enough, can lead to fluctuations in cave temperatures and moisture regimes that are outside the normal range of variability for the system, especially for shallower caves. Lastly, soil disturbance may lead to increased density of red imported fire ants, which can enter caves

and prey upon karst invertebrates. Soil disturbance can also alter the physical environment of the cave by causing increased rates of sedimentation.

- Quarrying and other materials excavation operations have the potential to alter the stable physical environment of the cave ecosystem by increasing the number of cave entrances, which could have a drying effect, increase sedimentation rates, and change water drainage patterns to the system. Caves, of course, can also be completely destroyed through this type of activity.

Page 2-31 of the environmental impact statement/habitat conservation plan developed for the BCCP (RECON and USFWS 1996) states that in order for the permit holders to get "No Surprises" assurances under the ESA for caves containing non-listed covered karst invertebrates, the specifically named caves must be protected as follows:

> "To be considered 'protected,' a karst fauna area must contain a large enough expanse of continuous karst and surface area to maintain the integrity of the karst ecosystem on which each species depends. The size and configuration of each karst fauna area must be adequate to maintain moist, humid conditions, air flow, and stable temperatures in the air-filled voids; maintain an adequate nutrient supply; prevent contamination of the surface and groundwater entering the ecosystem; prevent or control the invasion of exotic species, such as fire ants; and allow for movement of the karst fauna and nutrients through the interstitium between karst features. In most instances, this will entail protecting the entire surface and sub-surface drainage area of each cave and enough of the surface vegetation community to support small animals and buffer against fire ant infestations that can eliminate native ant populations. In absence of detailed hydrological studies for use in delineating cave preserve boundaries, land delineated by the contour interval representing the bottom of the cave should be targeted for preservation."

The potential for construction and use of SH 45SW to impair the ecological integrity of Flint Ridge Cave, and thus perhaps render it unable to be considered protected under the BCCP, was examined based on analysis of potential effects to eight primary components of karst invertebrate habitat as identified by the USFWS (2011b). These eight primary habitat components are:

- Cave and karst habitat
- Mesocaverns
- Microhabitat
- Drainage basins
- Humidity and temperature
- Nutrients
- Surface vegetation community
- Surface animal community

As an aside, as identified above, the requirements for a cave being considered protected under the BCCP suggest protection of the subsurface drainage area of the feature or, in absence of detailed hydrological studies that allow identification of the subsurface drainage area, preservation of land delineated by the contour interval representing the bottom of the cave. As discussed below, it is extremely difficult to delineate the subsurface drainage basin of a cave. Therefore, for the purposes of

protecting caves for the BCCP, protection of the subsurface drainage basin is pushed towards protecting land delineated by the contour interval equal to elevation of the bottom of the cave. An inherent problem with that methodology is that caves in the Edwards Group are often developed in areas where topography is relatively flat. As such, land occurring above the elevation of the floor of a cave may extend well beyond the limits of the area that could reasonably be expected to be providing groundwater to that cave. Flint Ridge Cave provides a perfect example of this problem. Because Flint Ridge Cave is so deep, if one were to assume its subsurface drainage area was all land that is contiguous with the surface footprint of the cave and occurring at an elevation above the floor of the cave, it would encompass a preposterously large area. To the north, such an area would include nearly all land occurring between Flint Ridge Cave and Barton Springs that has been shown by dye-tracing studies (BS/EACD 2002, 2006) to drain toward Barton Springs and not the other way around. To the west, it would stretch to southwestern Arizona.

Each of the eight primary constituents of karst invertebrate habitat is discussed below with regard to the potential for that constituent element as pertaining to Flint Ridge Cave to be adversely impacted by construction and use of SH 45SW. These discussions should be read with knowledge of Inner Space Cavern, a show cave located on the south side of the City of Georgetown, Williamson County, Texas. The cave is set amongst commercial developments along Interstate Highway 35 (IH-35), the IH-35 travel lanes go directly over the footprint of the cave, and the cave maintains a karst fauna assemblage that includes a federally listed endangered species (Bone Cave harvestman).

Cave and Karst Habitat: This component refers to the physical architecture of the humanly accessible subsurface habitat. The alignment for the SH 45SW project does not overlie the footprint of Flint Ridge Cave. The majority of the cave footprint occurs outside of the SH 45SW ROW with the exception of the terminal passage. In plan view the cave footprint extends within approximately 60 feet of the proposed edge of pavement of the roadway, but at a depth of approximately 150 feet below the land surface. Accordingly, the cave and karst habitat component of Flint Ridge Cave is not expected to be affected by construction or use of SH 45SW (SWCA and Cambrian Environmental 2014b).

Mesocaverns: This habitat component consists of humanly inaccessible void spaces that provide habitat for karst invertebrates and the only avenues for dispersal between caves. Mesocavern habitat is buffered from changes in temperature and humidity compared to the main rooms of caves with open entrances to the surface, and so likely is used for shelter by karst invertebrates when environmental conditions in caves are unfavorable (USFWS 2011b). Alternatively, it could be viewed that the karst invertebrates primarily reside in the mesocavern habitat and venture out into caves only if and when environmental conditions are favorable. The USFWS recently revised its karst invertebrate survey protocols (USFWS 2014c). These protocols now require that a cave be visited 14 times before the agency will accept that negative findings equate to absence of a species from the surveyed cave. The required number of visits strongly indicates the USFWS believes it is much more likely that karst invertebrates will be

occupying mesocavern habitat at any given point in time than they will be occupying accessible cave habitat.

That karst invertebrates must occupy mesocavern habitat is also demonstrated by the distribution of the karst invertebrate species themselves. Consider Bandit Cave spider in light of the reasoning the USFWS used to designate critical habitat for the Austin blind salamander. Recall that the agency delineated subsurface critical habitat for the Austin blind salamander based on the greatest distance of separation between the spring outlets at Barton Springs where the species has been found (984 feet), reasoning that this distance indicates the salamanders are able to travel 984 feet away from spring outlets in subterranean aquatic habitat (USFWS 2012). The Bandit Cave spider is known to occur in Bandit Cave and Flint Ridge Cave, two features that are separated by a distance of approximately 11 miles. The Bandit Cave spider is a meshweaver, meaning it builds a web that it uses as a safe retreat and to capture prey (Cokendolpher 2004). As such, meshweaver spiders lead sedentary lives. It is therefore beyond the limits of possibility that a 0.2-inch long spider left one of those two caves with no destination in mind and fertilized eggs in tow and was able to survive long enough to wander blindly through mesocavern habitat over a distance no less than 11 miles until it reached the other cave and founded a new population. Bandit Cave spiders must be capable of residing in mesocavern habitat developed between caves, and so must other species of karst invertebrates.

Because it is inaccessible to humans, mesocavern habitat extends for unknowable distances from the walls of a cave. The presence of a species such as Bandit Cave spider in multiple caves within and adjacent to the SH 45 ROW suggests a network of mesocavern habitat extends across the Edwards Group crossed by the SH 45SW ROW. However, the extent of the connectivity of that network is uncertain since it is possible that some of the mesocavern habitat that allowed species to spread across this area has since been eroded away, rendering some caves as isolated points of humanly accessible cave and karst habitat adjoined by their own disjunct zones of mesocavern habitat.

The pattern and extent of mesocavern habitat in the subsurface of the SH 45SW ROW is unknown. Mesocavern habitat beneath the ROW is presumed to be occupied by the same species of karst invertebrates that have been found in Flint Ridge Cave and other caves in the general vicinity. However, those species are expected to be occupying the mesocavern habitat in the ROW subsurface rather than moving between that habitat and Flint Ridge Cave. Given the very small size of karst invertebrates, the individuals occupying Flint Ridge Cave are expected to utilize mesocavern habitat that occurs in direct proximity to the cave. Because the roadway alignment does not overlie the cave footprint and no impacts to the cave and karst habitat of Flint Ridge Cave are expected because of the depth of the cave in proximity to the SH 45SW ROW, the mesocavern habitat component of Flint Ridge Cave is also not expected to be affected by construction of SH 45SW.

The roadway is proposed to be built on top of a strip of fill in the vicinity of Flint Ridge Cave in order to help control the direction of surface water runoff in the drainage area of

the cave. Building the road on fill instead of on a graded surface will preclude the road construction activity from destroying any mesocavern habitat present beneath the road alignment in proximity to Flint Ridge Cave. Any such mesocavern habitat is expected to be overlain or capped by clayey terra rossa soils. Consequently, the addition of the fill material is considered to have negligible potential to escape downward and fill or clog whatever mesocavern habitat is beneath the road alignment. Therefore, construction of the road is also not expected to impair the future ability of karst invertebrates to occupy and move through mesocavern habitat in proximity to Flint Ridge Cave. This will ensure that karst invertebrates in Flint Ridge Cave will remain integrated with their respective populations within the mesocavern habitat network and other connected caves.

Microhabitat: This habitat component consists of preferable breeding, feeding and sheltering sites within the cave itself, such as individual rocks that might cover a spider and its web. Because construction of SH 45SW is not expected to impact the cave and karst habitat, the microhabitat habitat component is also not expected to be affected by the project.

Drainage Basins: This habitat component consists of the surface and subsurface area that directs water to Flint Ridge Cave. The **surface** drainage area or basin of Flint Ridge Cave has largely been discussed in Section 2.1.1.1. Important to the discussion herein is that recent investigations have generated more accurate topographic mapping of the Flint Ridge Cave surface drainage basin than existed previously based on LIDAR and aerial survey data. The mapped drainage basin boundaries were also ground-truthed by observing runoff flow patterns following heavy rains in late September 2014. The most important difference between earlier and more recent drainage basin mapping is that while the boundaries of the drainage area still have not identified with precision (drainage area estimates range from 43.7 to 55.4 acres) it has now been demonstrated that the Flint Ridge Cave surface drainage basin does not extend west beyond the limits of the SH 45SW ROW as had been mapped by Hauwert (2010). Based on the recent mapping, the road alignment was pushed west as far as possible to minimize the amount of roadway that would be built in the surface drainage basin of Flint Ridge Cave. Current schematics for the roadway indicate that approximately 0.71 acres (1.28 – 1.62%) of the drainage basin would be covered by the roadway.

Runoff from the 0.71-acre of roadway in the surface drainage area would be routed outside of the Flint Ridge Cave surface drainage basin and treated through a series of structural and non-structural stormwater control measures. To compensate for the loss of drainage area, it is proposed that an area of equivalent acreage east of the roadway and along the Flint Ridge Cave drainage basin boundary will be graded upward so that it will contribute runoff to the Flint Ridge Cave drainage basin and result in no net loss of surface drainage area (see schematics in Appendix B). The added area would be constructed with clean soil taken from the site and re-vegetated with native vegetation.

It should be noted that due to its unusually large surface drainage basin, Flint Ridge Cave has been known to be completely inundated by storm water during flood events (David Johns/City of Austin, pers. comm. to H. Beatty/TxDOT and K.White/Cambrian Environmental). The large surface drainage basin suggests that water availability is not

likely a limiting factor for the terrestrial karst invertebrate species of concern known from the cave. In fact, because Flint Ridge Cave is occasionally inundated, the cave at times may act as a population sink, with the karst fauna in the cave being periodically wiped out by flooding and the cave then being re-inhabited via source populations residing in the surrounding mesocavern habitat. It is herein noted, therefore, that while the design of SH 45SW is proposed to maintain the size of Flint Ridge Cave surface drainage basin, the karst fauna inhabiting the cave might benefit from a reduction in drainage basin area.

In concept, the **subsurface** drainage basin is the subterranean area within which groundwater may flow into a cave or associated mesocavern habitat. As discussed earlier, delineation of a subsurface drainage basin is complicated for a variety of reasons. First, the concept is inherently problematic when the cave in question occurs within a contiguous karst landscape containing multiple caves set within a mesocavern network. Where does one drainage basin end and another begin? Caves in the Edwards Group were generally formed at or near ancient water tables under paleohydrologic conditions, and their morphology reflects that origin. Modern hydrology, however, tends to be dominated by vertical infiltration of small amounts of water along fractures. Does the shape of a cave have anything to do with the direction from which modern drainage may originate?

Because of these and many other uncertainties, in practice, delineations of subsurface drainage basins for caves containing endangered karst invertebrates in Texas have typically relied on the professional opinions of karst consultants using buffers of various distances based on metrics derived from cave footprints or other sources. This method is admittedly subjective. Few delineations have been performed based on actual tracing of moisture through the vadose (above the water table) zone above caves.[19] Given the proximity of the footprint of Flint Ridge Cave to the proposed SH 45SW roadway alignment, it seems highly probable that most karst consultants would identify some segment of the SH 45SW ROW as overlying the subsurface drainage basin of Flint Ridge Cave.

Based on well data and dye tracing studies, it is known that ground water in the Barton Springs Segment, once in the aquifer pool, travels generally northeastward to Barton Springs. Direction of flow is controlled by regional geologic dip – the bedding planes of the sedimentary layers in the region dip slightly to the northeast (Slade et al. 1986), and water is flowing over the upper surface of the underlying confining beds of the aquifer. But that does not necessarily mean that water infiltrating the ground travels northeastward while dropping through the vadose zone to the aquifer pool. In general,

[19] The City of Austin is conducting a study intended to help define the subsurface drainage basin of Flint Ridge Cave through injection of dye into the ground and watching for it to appear at various known drip locations in the cave ceiling (C. Lesniak/City of Austin, email communication to C. Swonke/TxDOT on March 25, 2014). The completion date is projected to be June 2015, but is subject to receipt of appropriate levels of precipitation.

water traveling through the vadose zone should be expected to travel downward vertically in response to the force of gravity, although it could be deflected laterally to some degree like a basketball falling through the canopy of a tree (although water would mostly be following established pathways and not randomly bouncing off branches). And like a basketball through a tree, the farther downward the water drains, the greater potential it has to move laterally away from its point of recharge before reaching the aquifer pool. Overall, despite the depth of Flint Ridge Cave, because of the force of gravity it is expected that the limits of the subsurface drainage basin of the cave do not extend particularly far beyond the footprint of the cave under typical aquifer conditions.

Flint Ridge Cave extends at least 152 feet underground (Elliott 1997). This is generally equivalent to the depth to groundwater in the local area based on well data (Texas Water Development Board 2014). This suggests that at times of high aquifer levels the floor of Flint Ridge Cave could be inundated by groundwater. Accordingly, at times the subsurface drainage basin of Flint Ridge Cave could expand to also include the Barton Springs Segment aquifer pool from the Hays County groundwater divide north to the cave. However, at such times it could be expected that the temporarily increased size of the drainage basin would be working against the karst fauna in Flint Ridge Cave by causing drowning deaths, rather than helping to support it.

It was previously speculated by a group of consultants working on behalf of TxDOT that groundwater infiltrating the ground via the Bear Creek channel could be reaching Flint Ridge Cave (Paulson et al. 2004 as cited by Hauwert 2012), with Bear Creek thus acting as a contributing zone for the subsurface drainage basin of Flint Ridge Cave. A group working for the City of Austin in 2007 used fluorescent dye to test the flow path of water infiltrating the ground in the Bear Creek channel to the west of Flint Ridge Cave. Dye poured into the Bear Creek channel west of Flint Ridge Cave was not detected in the cave after 42 days of monitoring, but appeared at Barton Springs two days after introduction to Bear Creek (Hauwert 2012). This implies the western and southern limits of the Flint Ridge Cave subsurface drainage basin lie somewhere between Flint Ridge Cave and Bear Creek.

Ultimately, while the limits of the subsurface drainage basin of Flint Ridge Cave are undefined, it seems reasonable to believe that because of the force of gravity the subsurface drainage basin is largely confined to a zone that underlies the surface in general proximity to the cave footprint. While not known for certainty, it does seem probable that a section of SH 45SW ROW immediately west and southwest of Flint Ridge Cave overlies the subsurface drainage basin for the cave. Based on the geologic structure that influenced the development of Flint Ridge Cave, the most likely area within the ROW to contribute water to the subsurface drainage basin is a fault plane along which the lower two-thirds of the cave is developed. This fault is identified as Fault 5 in the geologic assessment prepared by SWCA and Cambrian Environmental (2014a).

Constructing SH 45SW over a section of the subsurface drainage basin does not mean that impacts to the subsurface hydrology of Flint Ridge Cave would necessarily occur. The roadway itself is impervious cover and all storm water will be channeled away

through conveyances with impermeable liners. The impervious cover would in essence cap a segment of the footprint of the subsurface drainage basin, but because of the terra rossa soil covering, it is expected that already very little water is reaching the cave from that segment except where it is able to travel through the open conduits identified as features during the 2014 geologic assessment (SWCA and Cambrian Environmental 2014a). No sensitive karst features occurring within the SH 45SW ROW in general proximity to Flint Ridge Cave (and therefore within what could be the footprint of its subsurface drainage basin) will be covered by construction of the roadway. Therefore, construction of the road within the footprint of the subsurface drainage basin is expected to result in a negligible loss of water contribution to the cave.

One sensitive recharge feature (F-55) is present in the ROW in the general vicinity of Flint Ridge Cave. The feature is located approximately 1,200 feet north of the cave footprint, which is actually far enough away from the cave that it may very well be outside of the footprint of its subsurface drainage basin. Feature F-55 is a fractured rock outcrop within a small drainage channel and will be protected in accordance with TCEQ rules. The eastern edge of its surface drainage area defines the western limit of the Flint Ridge Cave surface drainage basin. In order to enhance protection of Flint Ridge Cave and reduce impact to its surface drainage basin, the roadway alignment is currently proposed to cross over F-55 using a bottomless culvert to maintain the hydrologic function of the feature. The culvert would allow unaltered runoff from its surface drainage area to continue to flow across the feature and infiltrate the ground.

A second sensitive feature (F-62a) is present just east of the ROW and immediately south of Flint Ridge Cave. It was not excavated by SWCA/Cambrian Environmental because it is located on land owned by the City of Austin. It will be included within the buffer area for Flint Ridge Cave along with its surface drainage basin.

Appropriate stormwater control measures will be implemented in the vicinity of Flint Ridge Cave (and throughout the SH 45SW ROW) during construction and use of the roadway according to the Water Pollution Abatement Plan. Stormwater control measures would be designed to mitigate impacts from stormwater and accidental spills. Analysis of spill data from TxDOT roadways indicates the chance of a hazardous material spill on SH 45SW is extremely low (see Appendix C).

Based on site characteristics and proposed drainage and stormwater control measures, significant impacts to the Flint Ridge Cave surface and subsurface drainage basins are not expected as a result of construction and use of SH 45SW.

Humidity and Temperature: This habitat component refers to the capacity of the subsurface environment to maintain atmospheric conditions that are buffered from variations in surface conditions. Construction of SH 45SW would cause some local vegetative cover to be replaced by roadway, which could result in slightly higher temperatures on the surface within the SH 45SW ROW during the warmer months of the year. However, because Flint Ridge Cave is so deep, it should be well insulated against any changes in surface temperatures caused by road construction. Because the cave is so deep and because the SH 45SW project will not impact the cave footprint

or alter the entrance to the cave, and is not expected to significantly alter the volume of water reaching the cave via its surface and subsurface drainage basins, no impacts to the humidity and temperature habitat component of Flint Ridge Cave are expected from construction of SH 45SW.

Nutrients: This habitat component refers to the cycling of organic matter within the cave system which relies upon input from the overlying surface ecology. The metric commonly used to determine the potential for these impacts is degree of protection of the likely trogloxene foraging area. Based on studies of common trogloxene species such as *Ceuthophilus* spp. cave crickets, the Service had determined this area to extend up to 345 feet (105 m) from the cave entrance. The entire potential trogloxene foraging area for Flint Ridge Cave is avoided by the current design for SH 45SW (SWCA and Cambrian Environmental 2014b).

That being said, in the case of Flint Ridge Cave, the cave is so large and deep that it is considered highly doubtful that trogloxenes are the only source of nutrients for the karst invertebrates that inhabit the cave. Trogloxenes, because they venture to the surface at night, can be expected to congregate in the upper reaches of the cave. Invertebrates inhabiting the lower reaches of the cave may receive little benefit from the regular influx of nutrients provided by trogloxenes. Instead, these invertebrates may have greater dependency on detritus being washed down to those levels by surface water runoff. Maintenance of the original surface drainage area of Flint Ridge Cave in a naturally vegetated state should maintain the current quality and amount of nutrients washed into the cave by surface water runoff following construction of SH 45SW. Accordingly, the nutrient habitat component of Flint Ridge Cave is not expected to be impacted by construction and use of SH 45SW.

Surface Vegetative Community: This habitat component refers to the native grassland/woodland required to provide forage for trogloxene species. The Service has determined that the minimal area required to sustain a native grassland/woodland for a karst invertebrate preserve is between 40 and 100 acres. Surface vegetative community will not be a limiting factor for Flint Ridge Cave following construction of SH 45SW because Flint Ridge Cave occurs on a contiguous block of City of Austin Water Quality Protection Lands that exceeds 350 acres in size.

Surface Animal Community: This habitat component refers to the fauna which provide carcasses, scat, and other forms of nutrient cycling for the trogloxene community. The surface animal community will not be a limiting factor for Flint Ridge Cave following construction of SH 45SW for the same reason as described directly above. The City of Austin Water Quality Protection Lands are expected to support an ample wildlife community sufficient to maintain the influx of nutrients into Flint Ridge Cave.

In conclusion, based on the size and depth of Flint Ridge Cave, surface site characteristics, presence of the cave within a block of protected land, and the careful design of SH 45SW that includes avoidance and minimization measures designed to maintain the size of the cave surface drainage area, the ecological integrity of Flint Ridge Cave is expected to be maintained following construction of, and with use of, SH

45SW because the integrity of the eight primary constituent elements of karst invertebrate habitat is expected to be maintained. For this reason, construction of SH 45SW is also not expected to adversely impact the ability of Flint Ridge Cave to continue to support the Bandit Cave spider and *Rhadine austinica*, which are the two species in the cave covered by the BCCP. TxDOT along with its partners and consultants have extensive experience in constructing and operating roadways in sensitive karst areas. Recent projects such as US 183-A, SH 45 North, RM 1431, IH-35 over Inner Space Cavern, and the SH 195 improvement project have all been completed with similar, but less extensive karst due-diligence programs.

5.0 CONCLUSIONS

Construction of SH 45SW as designed would result in the permanent disturbance of approximately 100.66 acres and the introduction of approximately 52.44 acres of impervious cover to the recharge zone for the Barton Springs Segment of the Edwards Aquifer. Clearing of the ROW for construction of the roadway would result in the permanent loss of approximately 100.66 acres of vegetation and conversion of approximately 10.93 acres of woody vegetation communities to herbaceous communities in areas that would be temporarily disturbed by construction. Vegetation communities within the SH 45SW ROW are generally common and widespread regionally, so the loss of this vegetation is considered minor from a biological standpoint.

Use of SH 45SW is expected to result in periodic wildlife mortalities as a result of collisions with vehicles. Species most likely to suffer collision mortality are generally common in the region. Presence of the roadway is expected to create a barrier to movement to some species, possibly affecting their distribution at the local, but not regional, level.

No federally listed threatened or endangered species are expected to be adversely impacted by construction of SH 45SW. The design of the road, including its stormwater controls and water quality BMPs, coupled with the comparatively small scale of the project relative to the size of the Barton Springs watershed, are expected to preclude the project from adversely impacting the Barton Springs salamander or Austin blind salamander. One terrestrial listed species, the golden-cheeked warbler, has occurred irregularly in proximity to the SH 45SW ROW, but construction of the road would not result in loss of any habitat known to be used by this species. Presence and use of the road is not expected to alter the future ability of golden-cheeked warblers to occur in woodlands adjacent to the ROW, or adversely affect their ability to attract mates or successfully raise young.

Flint Ridge Cave, a large cave with an entrance located a short distance east of the SH 45SW ROW, has been identified for protection in the BCCP because it is known to support some species of karst invertebrates that are believed to be rare. SH 45SW has been designed to maintain the volume of water flowing into this feature, but the feature is deep enough, and its surface drainage basin is large enough, that water availability is unlikely to be of major concern with regard to maintaining the ecological integrity of this

cave. The cave is known to fill with water during especially heavy precipitation events, which cannot have positive impacts or even neutral effects for air-breathing karst fauna. Consequently, while the acreage of the surface drainage area would be maintained, it is wondered herein if reduction of the surface drainage area for this cave might be beneficial to the karst fauna it supports. Regardless, owing to the size and depth of Flint Ridge Cave and maintenance of its surface drainage area, construction of SH 45SW is expected to have a negligible effect on the current ecological integrity of the feature, so it is expected that the karst faunal community inhabiting the cave will be unaffected by construction and use of the roadway.

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Appendix A: Comparison of Current SH 45SW Alignment and the Alignment Examined in the DEIS

FM 1626 NORTH

FM 1626 SOUTH

FREEWAY ENDS
SIGNAL AHEAD

FM 1626

45_1626_EN

45_1626_ES

CL45EB01

CL45EB01

SH 45SW

CL45WB01

CL45WB01

WATER QUALITY POND

45_1626_NW

45_1626_SW

RETAINING WALL

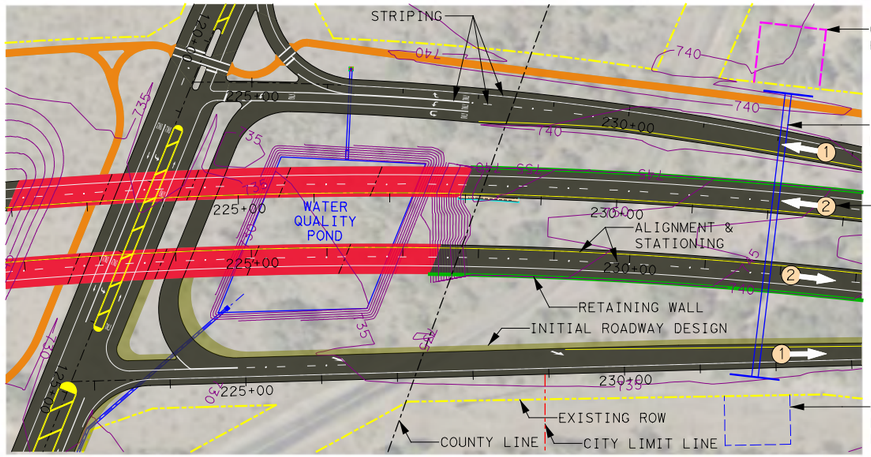
RETAINING WALL

RECHARGE ZONE
TRANSITION ZONE

HAYS COUNTY
TRAVIS COUNTY

STA. 217+00 (CL45WB01)

LINE AND SYMBOL LEGEND



0 100′ 200′

SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

INTERIM REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF WADE E. STRONG, PE 61841 ON 10/28/2014
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
BEGIN TO STA. 217+00

SHEET 1 OF 13

APPENDIX C

10/28/2014
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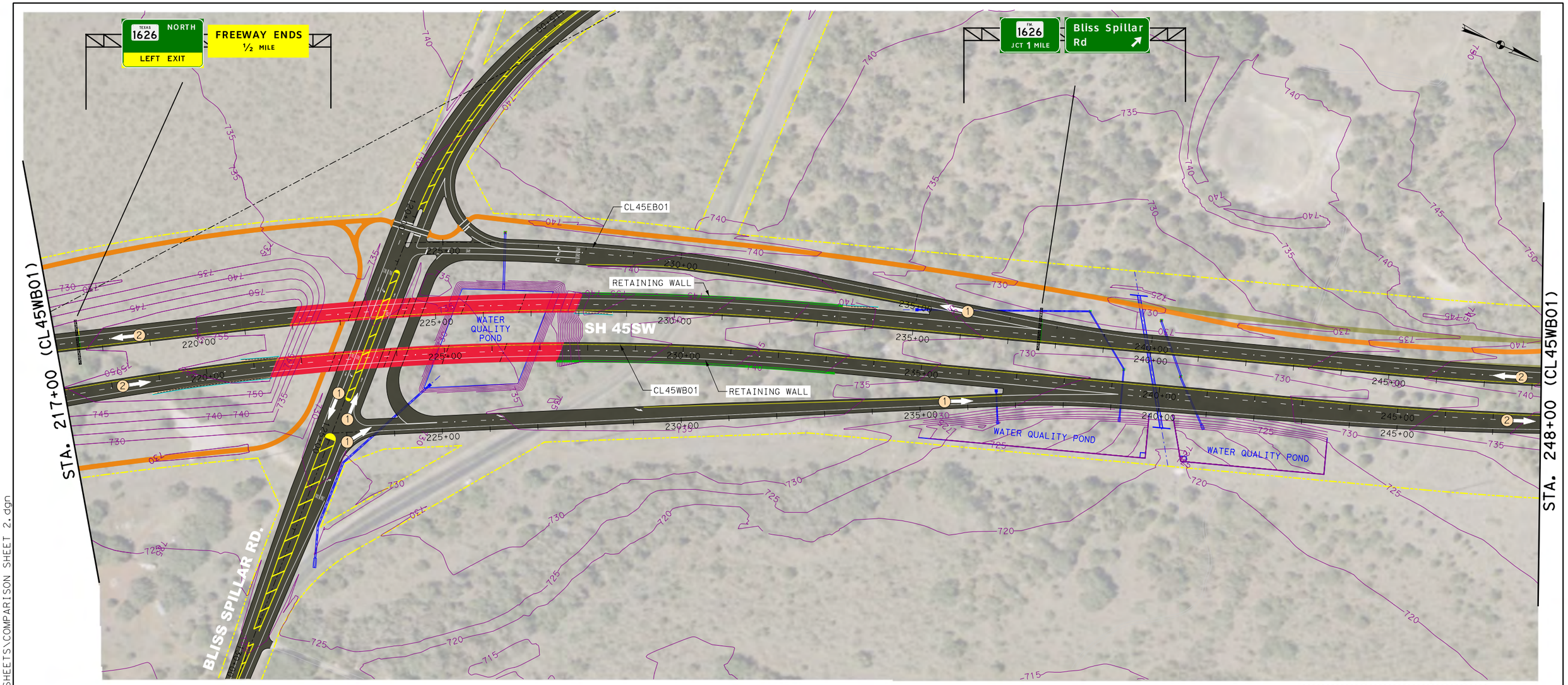

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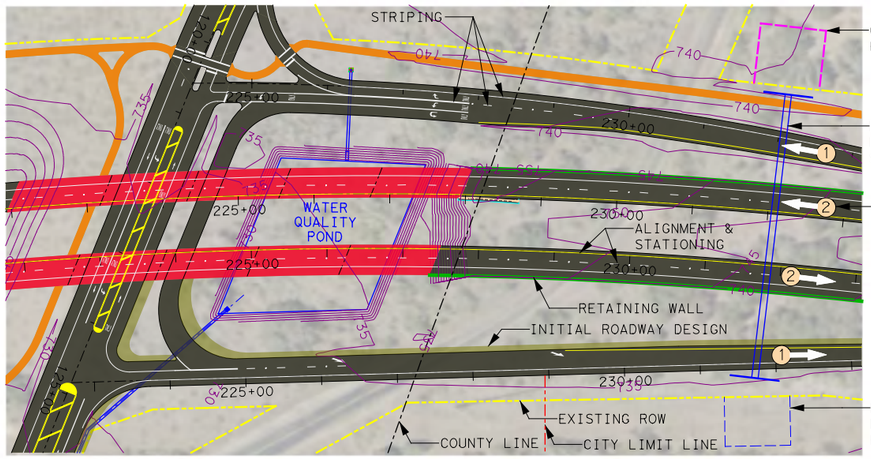

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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

INTERIM REVIEW

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DATE: 10/28/2014

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 217+00 TO STA. 248+00

SHEET 2 OF 13 APPENDIX C

10/28/2014
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STA. 248+00 (CL45WB01)

STA. 278+00 (CL45WB01)

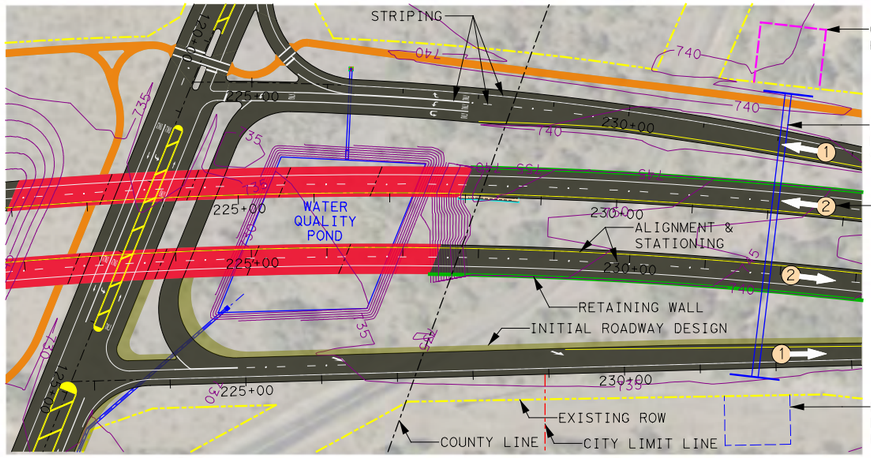
SH 45SW

CL45EB01

CL45WB01

250+00 255+00 260+00 265+00 270+00 275+00

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

INTERIM REVIEW

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Texas Department of Transportation®

SH 45 SW

ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 248+00 TO STA. 278+00

SHEET 3 OF 13

APPENDIX C

10/28/2014
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STA. 278+00 (CL45WB01)

STA. 309+00 (CL45_01)

TOLL ROAD

PAY BY Mail

TOLL ROAD

PAY BY Mail

LOOP 1 SOUTH

EXIT 1 MILE

EXIT ONLY

RETAINING WALL

RETAINING WALL

CL45_01

SH 45SW

F110 (Jubilee Cave)

F64

F65

F62a

WQP

CREEK

BEAR

WATER QUALITY POND

280+00

285+00

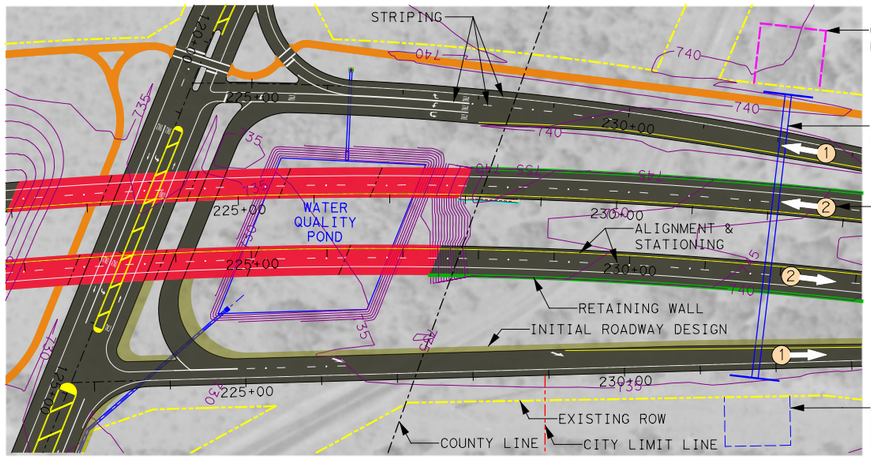
290+00

295+00

300+00

305+00

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

INTERIM REVIEW

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FIRM #587

Texas Department of Transportation®

DATE: 11/17/2014

SH 45SW ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 278+00 TO STA. 309+00

11/17/2014
P:\8140403\dlv\planSht s\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 4.dgn

STA. 309+00 (CL45_01)

STA. 340+00 (CL45_01)

FUTURE VIOLET CROWN TRAIL (BY OTHERS)

RETAINING WALL

WATER QUALITY POND

F55

RETAINING WALL

RETAINING WALL

CL45_01

12'x4' CON SPAN

SH 45SW

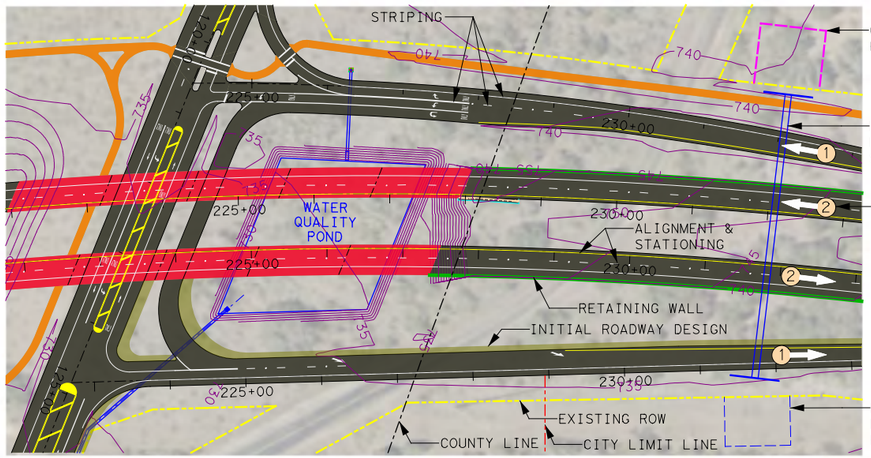
F41

FLINT RIDGE CAVE

TEXAS 45 WEST

LOOP 1 NORTH EXIT ONLY

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/28/2014

SH 45SW
PRELIMINARY SCHEMATIC DESIGN

SH 45SW
STA. 309+00 TO STA. 340+00

SH 45 SW
ENVIRONMENTAL STUDY

10/28/2014
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STA. 340+00 (CL45_01)

STA. 371+00 (CL45_01)

SH 45SW

WQP

F23
(Hat Sink)

F29d
F29b
F29c

CL45_01

RETAINING WALL

F16

F18
(Cow Pattie Cave)

WATER QUALITY POND

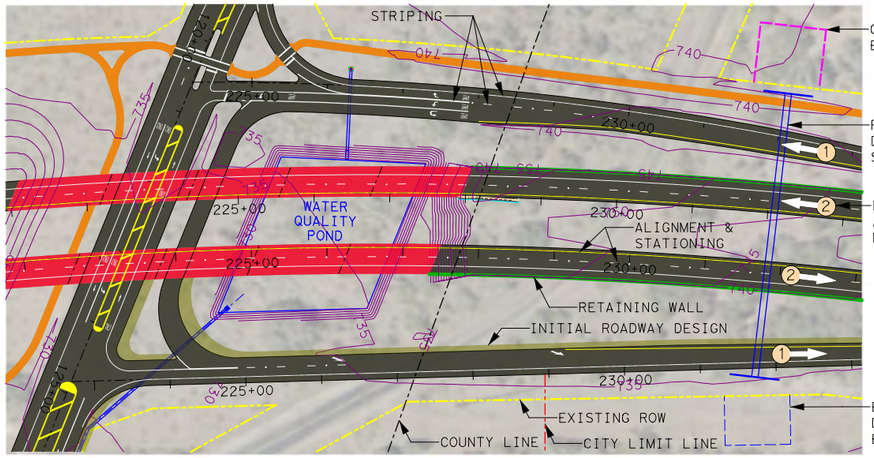
AUSTIN CITY LIMITS

DANZ CREEK SPLIT

TEXAS 45 WEST

LOOP 1 NORTH
EXIT ONLY

LINE AND SYMBOL LEGEND



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SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
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ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 340+00 TO STA. 371+00

10/28/2014
P:\8140403\dlv\planShts\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 6.dgn

STA. 371+00 (CL45_01)

STA. 1164+00 (LP1SB)

ARCHELETA BLVD.

DANZ CREEK SPLIT

AUSTIN CITY LIMITS

SH 45

SH 45SW

SL1 (MOPAC)

DANZ CREEK

LP1NB_01

LP1SB

CL45EB04

CL45EB02

CL45WB02

CL45_01

45_LP1_WN

RETAINING WALL

F157a
(SH45 Cave)

F157b

F161

TRAILHEAD PARKING
UNDER BRIDGE

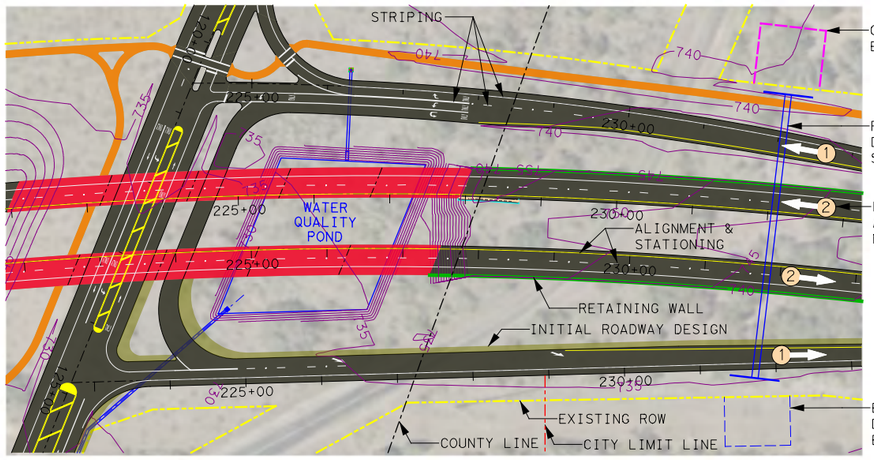
FUTURE VIOLET
CROWN TRAIL
(BY OTHERS)

WATER
QUALITY
POND

EAST
EXIT ONLY

NORTH

LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

INTERIM REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF WADE E. STRONG, PE 61841 ON 10/28/2014
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/28/2014

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 371+00 TO STA. 1164+00

SHEET 7 OF 13

APPENDIX C

10/28/2014
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STA. 1164+00 (LP1SB)

DANZ CREEK

LP1NB_01

LP1SB

SH 45

F163

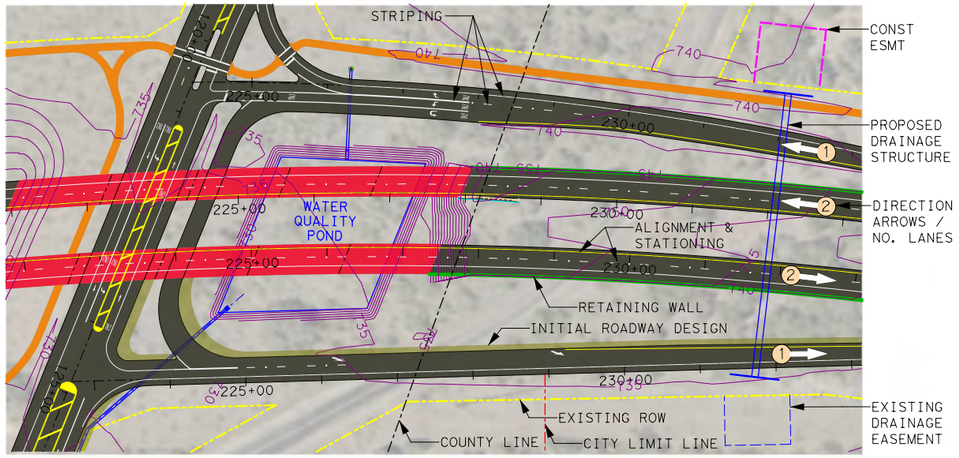
ESCARPMENT BLVD.

2600'±

45 EAST
LEFT EXIT

45 EAST
EXIT 1 MILE
LEFT EXIT

LINE AND SYMBOL LEGEND



0 100' 200'
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
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SH 45SW
ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SH 45SW
STA. 1164+00 TO END

10/28/2014
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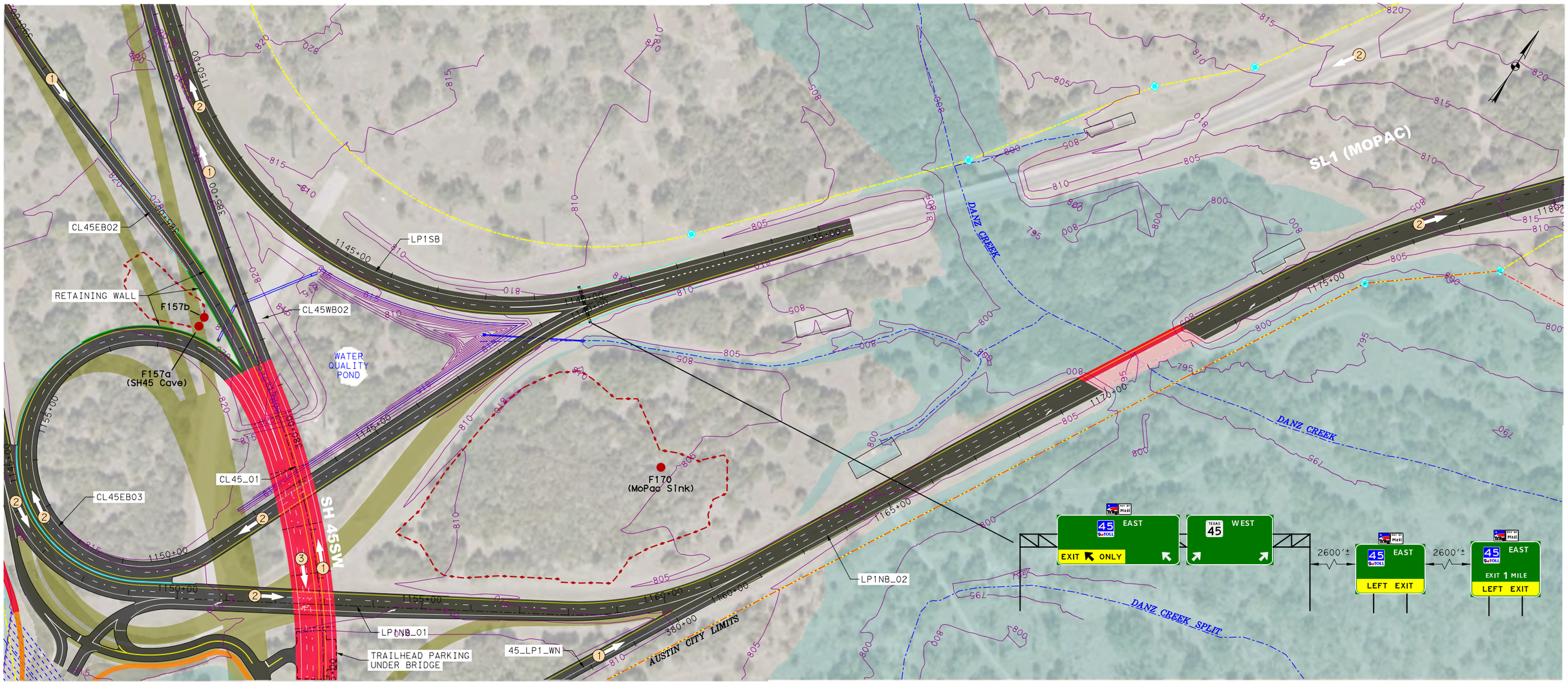

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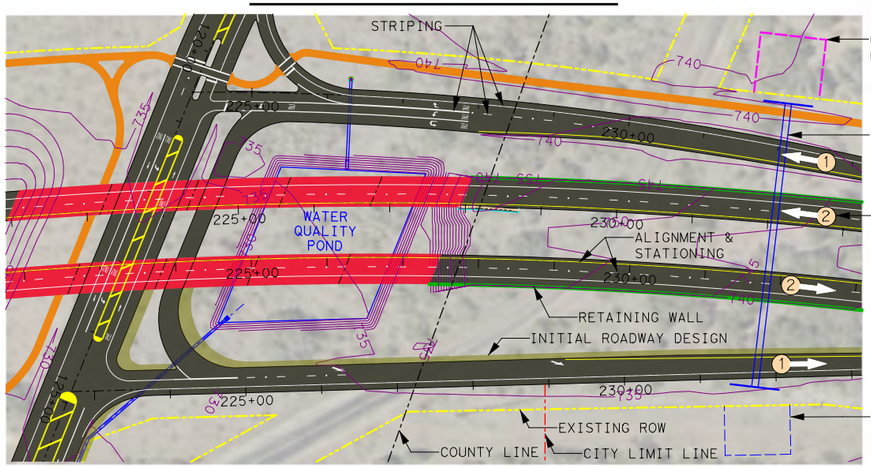

0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/28/2014

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SL1 (MOPAC)
BEGIN TO END

10/28/2014
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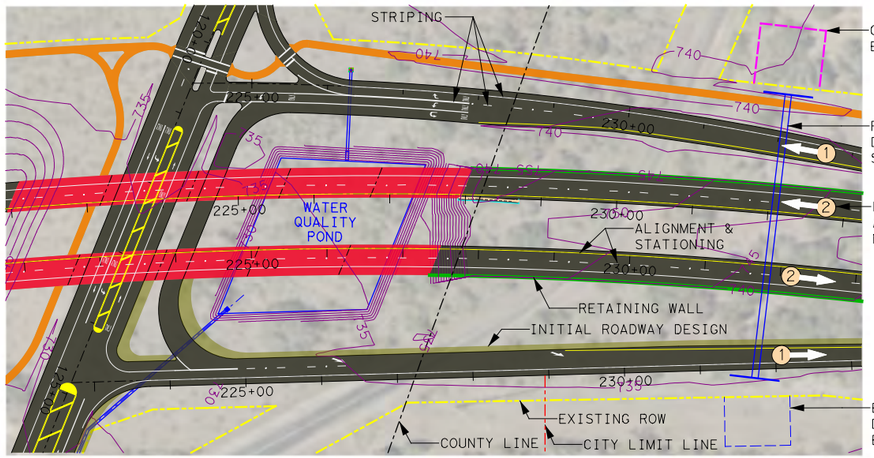
LINE AND SYMBOL LEGEND



0 100′ 200′
SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
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- EXISTING BRIDGE STRUCTURE
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FIRM #587

Texas Department of Transportation®

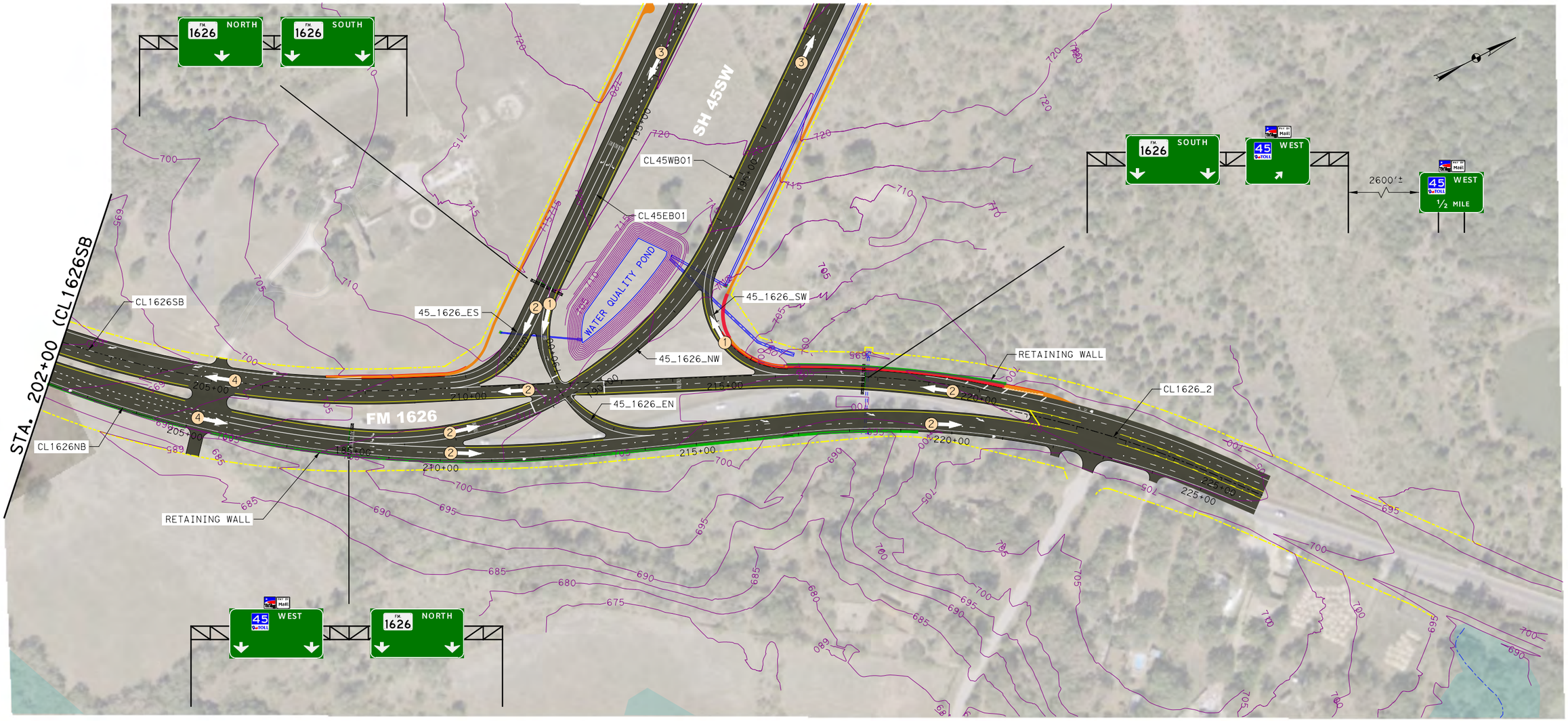
SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

FM 1626
BEGIN TO STA. 202+00

10/28/2014
P:\8140403\dlv\planShts\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 10.dgn



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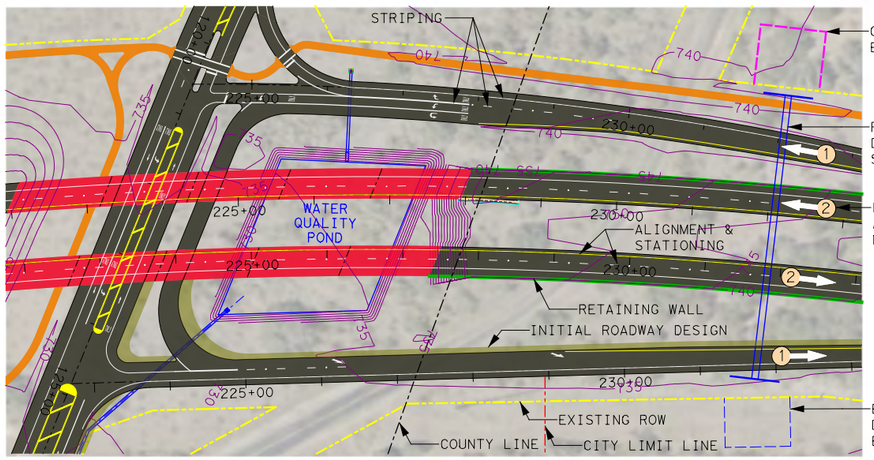

0 100′ 200′

SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

FM 1626
STA. 202+00 TO END

10/28/2014
P:\8140403\dlv\planShts\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 11.dgn

BLISS SPILLAR ROAD

100+00

105+00

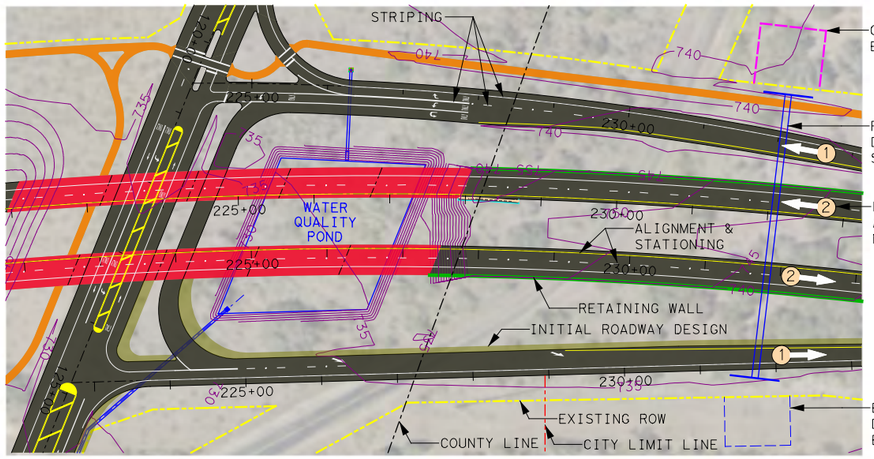
115+00

STA. 115+00 (CLBLISPIL)

CLBLISPIL

750 745 740 735 730

LINE AND SYMBOL LEGEND



0 100′ 200′

SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW

ENVIRONMENTAL STUDY

DATE: 10/28/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

BLISS SPILLAR ROAD
BEGIN TO STA. 115+00

10/28/2014
P:\8140403\dlv\planSht s\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 12.dgn

STA. 115+00 (CLBLISPIL)

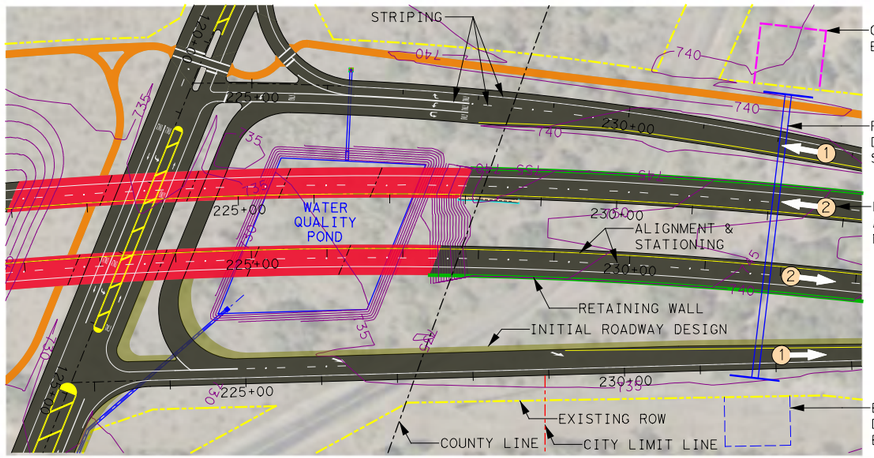
CLBLISPIL

BLISS SPILLAR ROAD

SH 45SW

WATER QUALITY POND

LINE AND SYMBOL LEGEND



0 100′ 200′

SCALE IN FEET

DRAINAGE AREA BASED ON AERIAL SURVEY

COLOR LEGEND

- PROPOSE PAVEMENT/ OVERLAYED EXISTING PAVEMENT
- PROPOSED BRIDGE STRUCTURE
- PROPOSED SHARED USE PATHS
- EXISTING BRIDGE STRUCTURE
- FEMA 100 YR. FLOOD ZONE
- INITIAL ROADWAY DESIGN

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW ENVIRONMENTAL STUDY

DATE: 10/28/2014

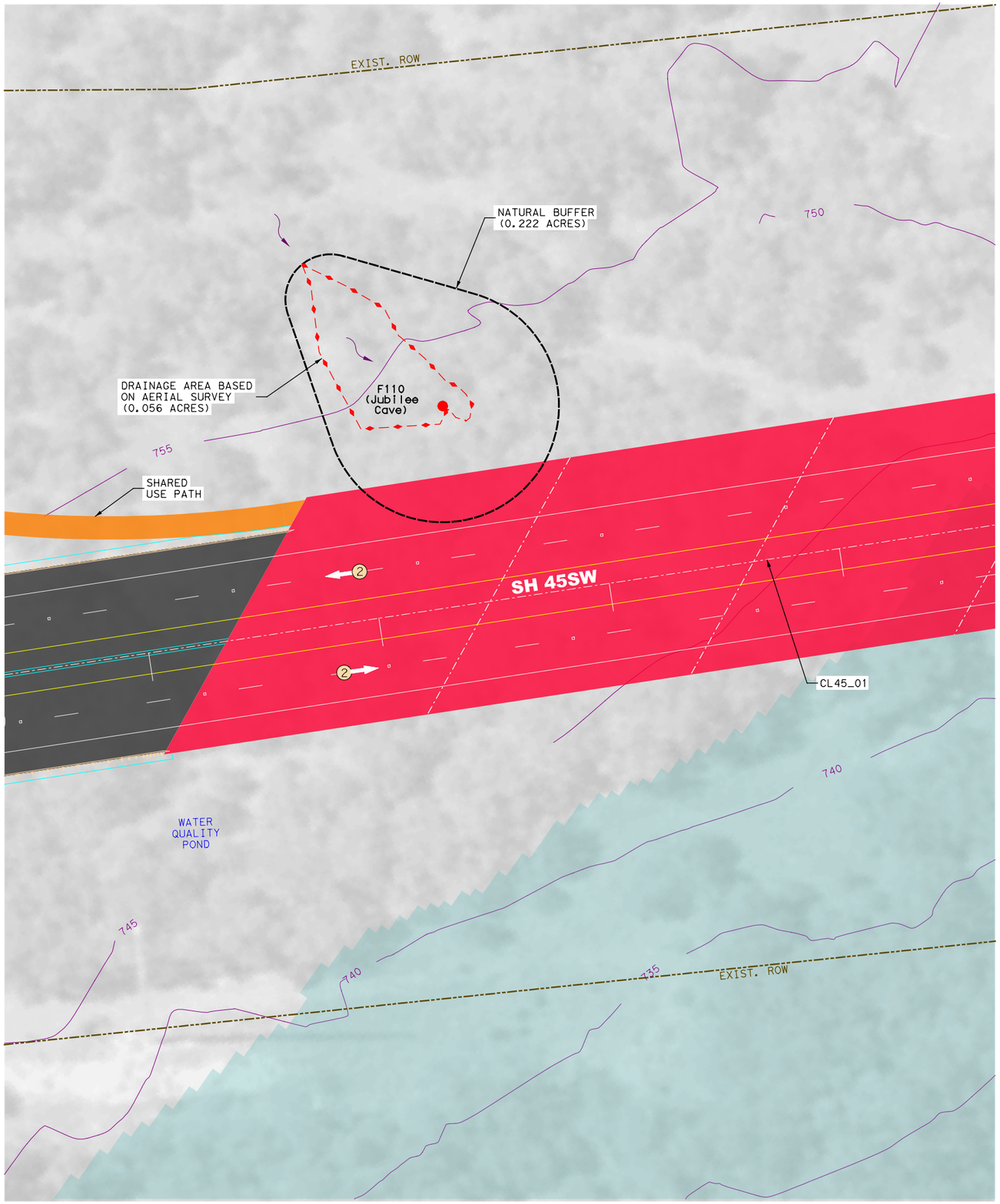
SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

BLISS SPILLAR ROAD
STA. 115+00 TO END

SHEET 13 OF 13 APPENDIX C

10/28/2014
P:\8140403\dlv\planSht\Schematics\EIS COMPARISON SHEETS\COMPARISON SHEET 13.dgn

Appendix B: Proposed SH 45SW Drainage Controls and Contours



0 25′ 50′

SCALE IN FEET

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BRIDGE DRILL SHAFT CONSTRUCTION WITHIN THE NATURAL BUFFER SHALL BE AVOIDED TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

INTERIM REVIEW

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SH 45SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

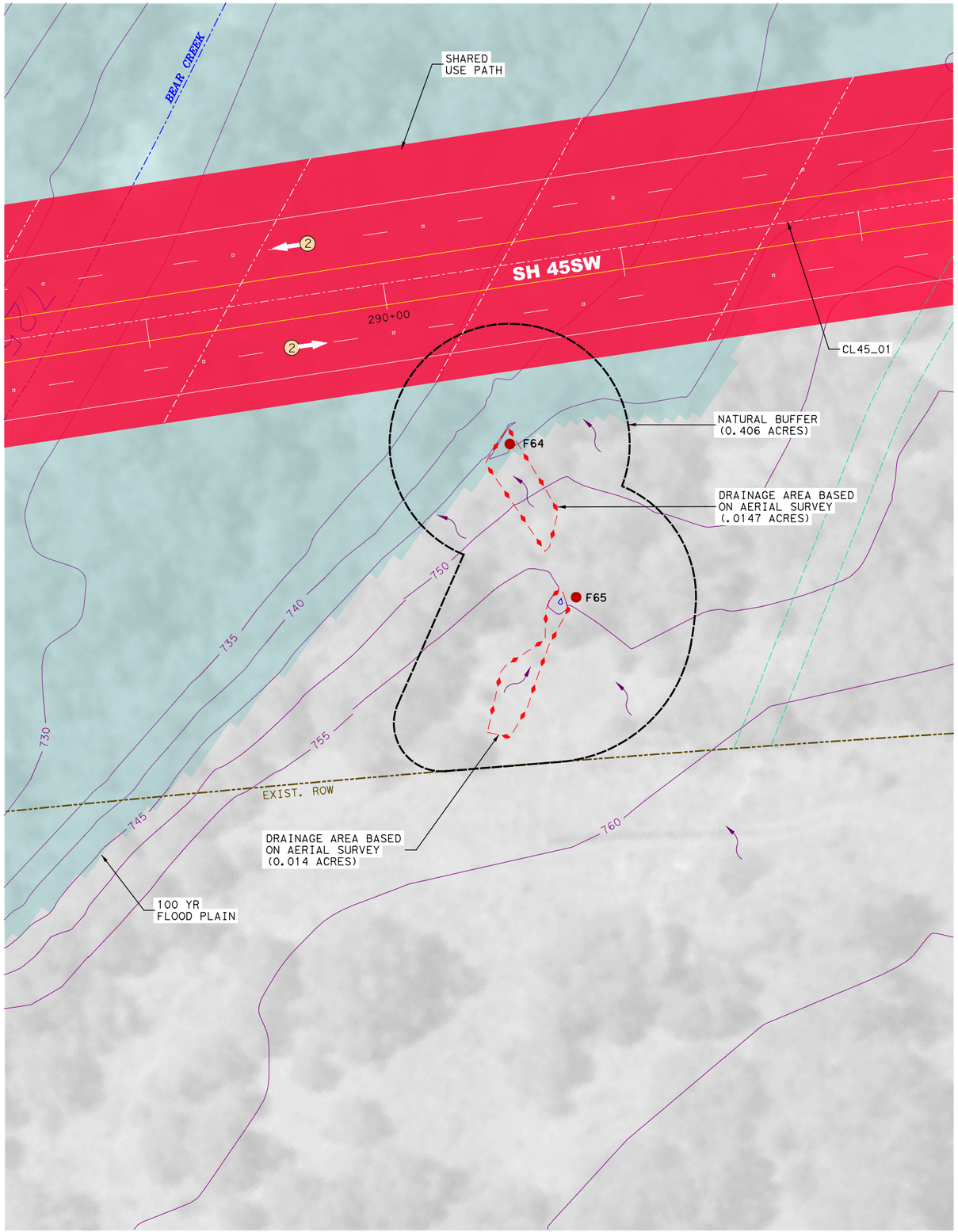
Texas Department of Transportation®

DATE: 11/17/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F110
JUBILEE CAVE
DRAINAGE DETAILS

11/17/2014
P:\8140403\dlv\planSht\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 1.dgn



CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BRIDGE DRILL SHAFT CONSTRUCTION WITHIN THE NATURAL BUFFER SHALL BE AVOIDED TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

0 25′ 50′
SCALE IN FEET

INTERIM REVIEW
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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

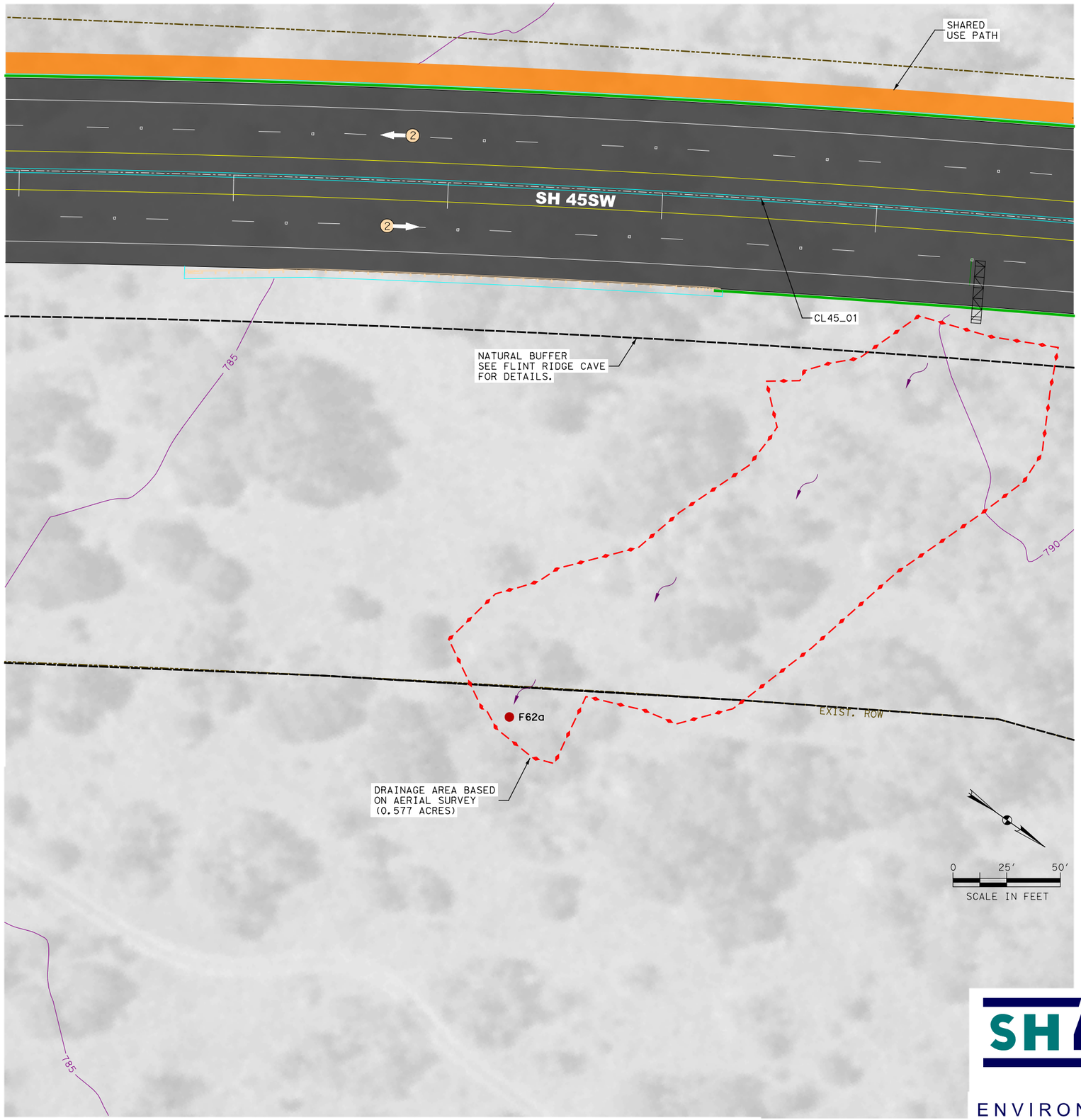
Texas Department of Transportation®

DATE: 11/17/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES F64 & F65
DRAINAGE DETAILS

11/17/2014
P:\8140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 2.dgn



NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45SW
ENVIRONMENTAL STUDY

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F62a
DRAINAGE DETAILS

10/27/2014
P:\8140403\dlv\planSht\Schematics\DETAIL SHEET 3.dgn

NOTE:
1. THE PROPOSED ROADWAY REMOVES 0.7 ACRES OF DRAINAGE AREA. A COMPENSATORY AMOUNT OF DRAINAGE AREA WILL BE RE-ROUTED FROM THE HATCHED AREA SHOWN INTO FLINT RIDGE CAVE.

EXIST. R.O.W.

WATER QUALITY POND

CL45_01

F55

12'x4' CON-SPAN

SH 45SW

315+00

330+00

RETAINING WALL

F41

F62a

FLINT RIDGE CAVE

FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT

CROSS-HATCHED AREA REPRESENTS 0.7 ACRES OF FLINT RIDGE CAVE DRAINAGE AREA THAT IS REMOVED BY ROADWAY CONSTRUCTION

HATCHED AREA REPRESENTS A MINIMUM EQUIVALENT DRAINAGE AREA THAT WOULD BE RE-ROUTED TO FLINT RIDGE CAVE AS NEEDED TO REPLACE DRAINAGE AREA BEING REMOVED BY THE ROADWAY DESIGN

COMBINED NATURAL BUFFER FOR FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT, FEATURE F-62a and FEATURE F-41. THIS AREA TO BE FREE FROM CONSTRUCTION EXCEPT FOR TEMP/PERM BMP & EMBANKMENT CONSTRUCTION OPERATIONS. (11.99 ACRES)

DRAINAGE AREA BASED ON AERIAL SURVEY (55.53 ACRES)

DRAINAGE AREA BASED ON 2012 2' LIDAR (54.50 ACRES)

CRICKET FORGING AREA (105 METER RADIUS)

LEGEND

- F62a ● = SENSATIVE KARST FEATURE
- = DRAINAGE AREA BASED ON AERIAL SURVEY
- = DRAINAGE AREA BASED ON 2012 2' LIDAR
- = FLINT RIDGE CAVE DRAINAGE AREA (USED IN DRAFT EIS)
- = SHARED USE PATH
- = DRAINAGE FLOW DIRECTION
- = EXISTING RIGHT OF WAY
- = CRICKET FORGING AREA (105 METER RADIUS)
- = NATURAL BUFFER (CONSTRUCTION-FREE ZONE)

NATURAL BUFFERS

1. BUFFER ZONES AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF NATURAL BUFFERS AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. INTERCEPTOR SWALES AND/OR DIVERSION DIKES WILL BE USED TO TEMPORARILY DIVERT SEDIMENT LADEN RUNOFF AWAY FROM FLINT RIDGE CAVE DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

0 100' 200'
SCALE IN FEET

INTERIM REVIEW
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SH 45 SW
ENVIRONMENTAL STUDY

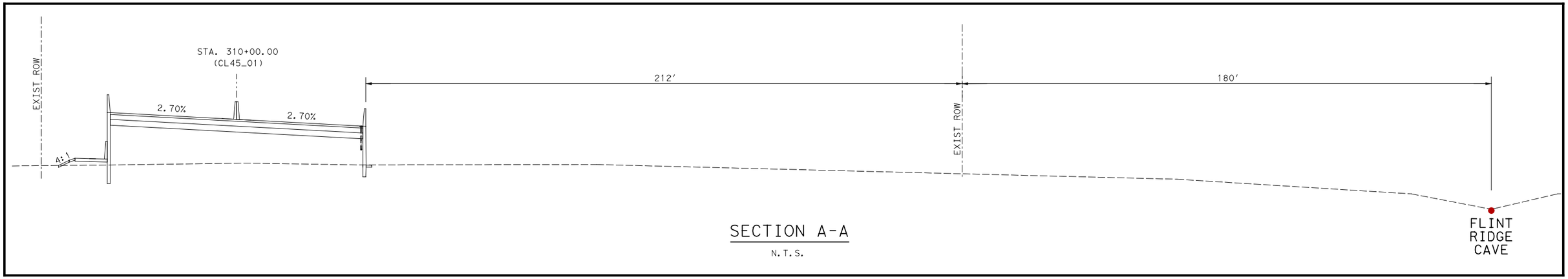
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 1/7/2015

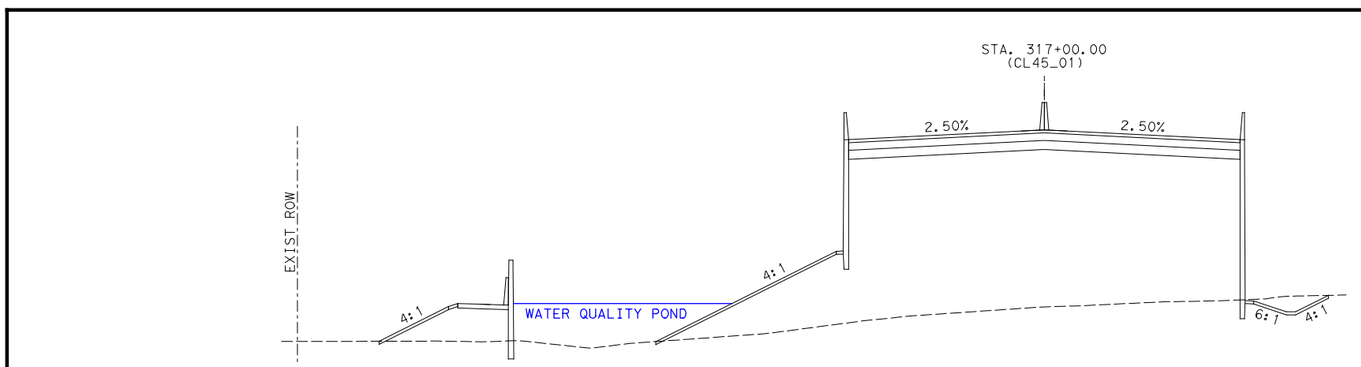
SH 45SW RIGHT OF WAY WITHIN THE AREA OF POTENTIAL EFFECTS ON FLINT RIDGE CAVE

1/7/2015
P:\81404403\dlv\planSht\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 4.dgn



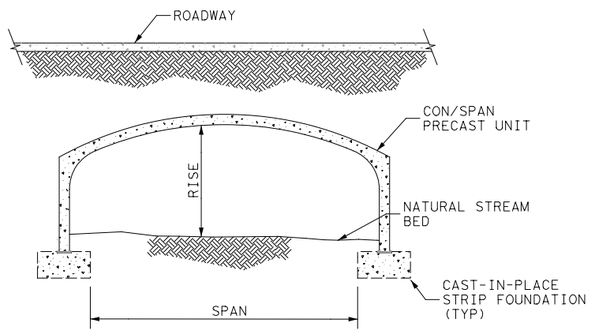
SECTION A-A

N.T.S.



SECTION B-B

N.T.S.



SECTION C-C

N.T.S.

INTERIM REVIEW

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SH 45SW

ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/19/2014

SH 45SW RIGHT OF WAY
WITHIN THE AREA OF
POTENTIAL EFFECTS ON
FLINT RIDGE CAVE

10/19/2014
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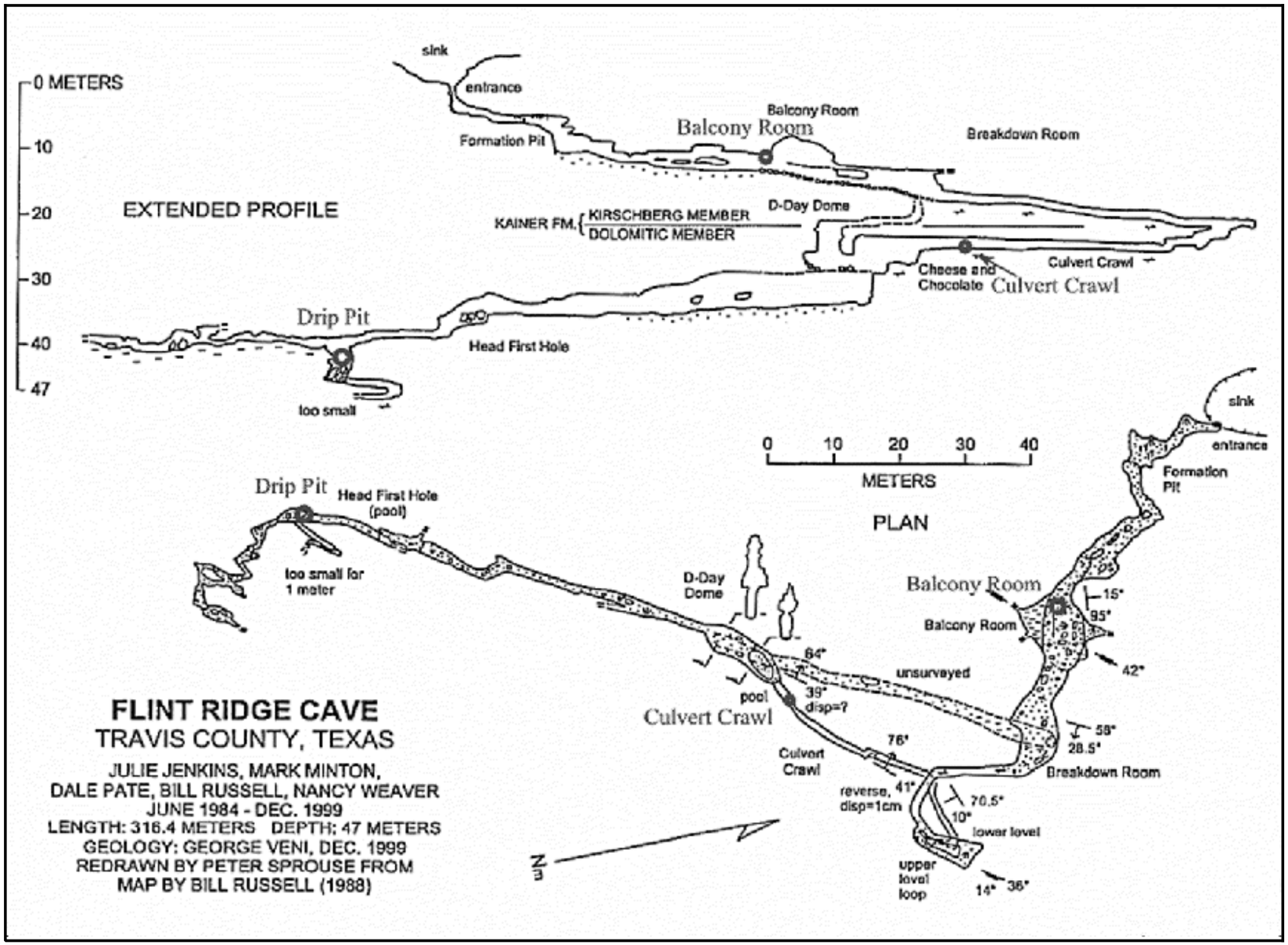

FLINT RIDGE CAVE
TRAVIS COUNTY, TEXAS

JULIE JENKINS, MARK MINTON,
DALE PATE, BILL RUSSELL, NANCY WEAVER
JUNE 1984 - DEC. 1999
LENGTH: 316.4 METERS DEPTH: 47 METERS
GEOLOGY: GEORGE VENI, DEC. 1999
REDRAWN BY PETER SPROUSE FROM
MAP BY BILL RUSSELL (1988)

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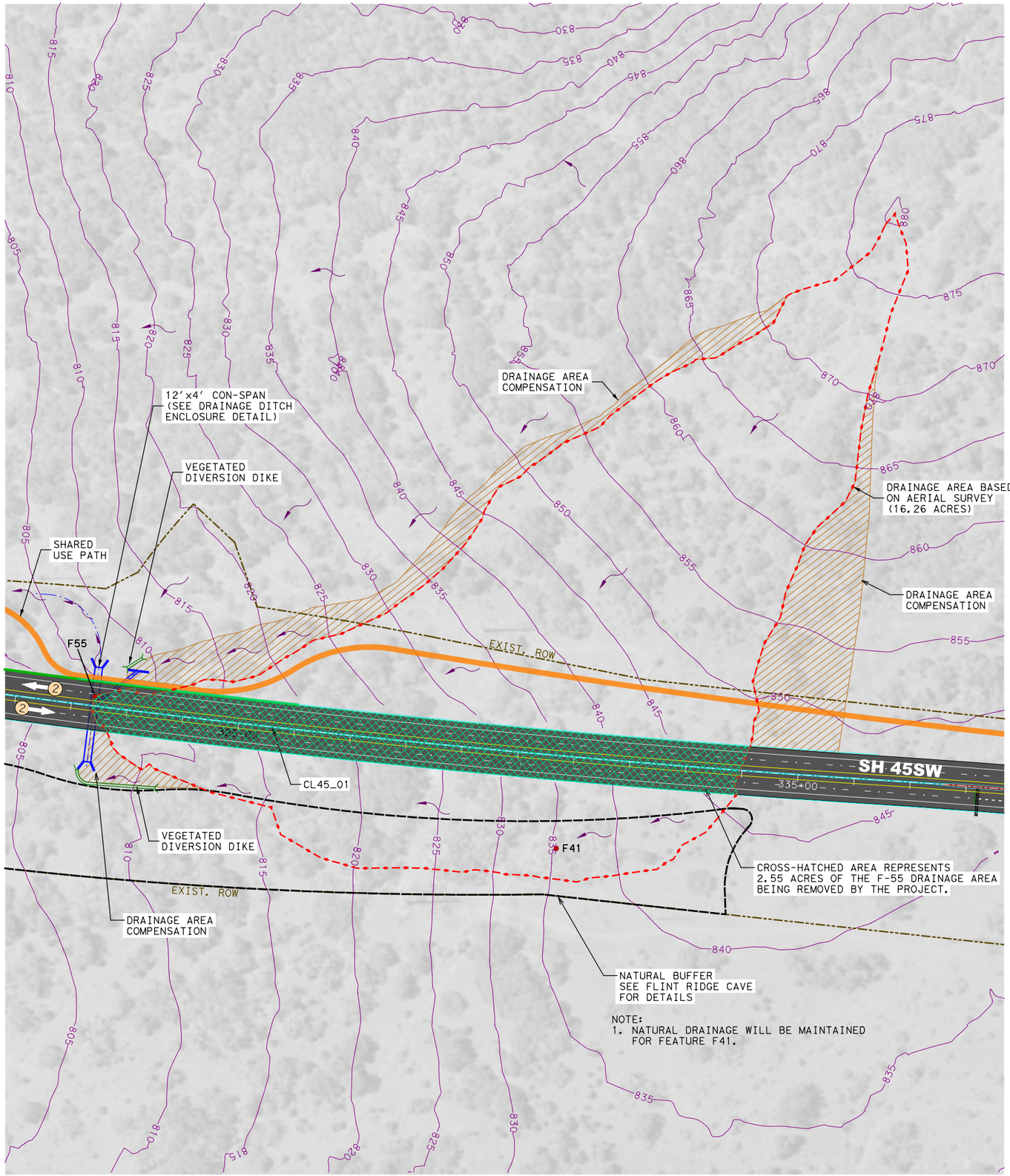
Texas Department of Transportation®

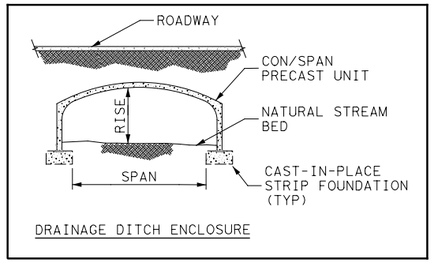
DATE: 10/19/2014

SH 45SW RIGHT OF WAY
WITHIN THE AREA OF
POTENTIAL EFFECTS ON
FLINT RIDGE CAVE

SH 45 SW
ENVIRONMENTAL STUDY

10/19/2014
C:\8140403\div\planShts\Schematics\DETAIL SHEET 4b.dgn





DRAINAGE DITCH ENCLOSURE

NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
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4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

NOTE:
1. THE PROPOSED ROADWAY DESIGN REMOVES 2.55 ACRES FROM THE F55 DRAINAGE AREA. A COMPENSATORY AMOUNT OF AREA FROM OFFSITE TO WEST (CROSS-HATCHED AREA SHOWN) WILL BE RE-ROUTED BACK TO THIS FEATURE.

0 100' 200'
SCALE IN FEET

INTERIM REVIEW

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

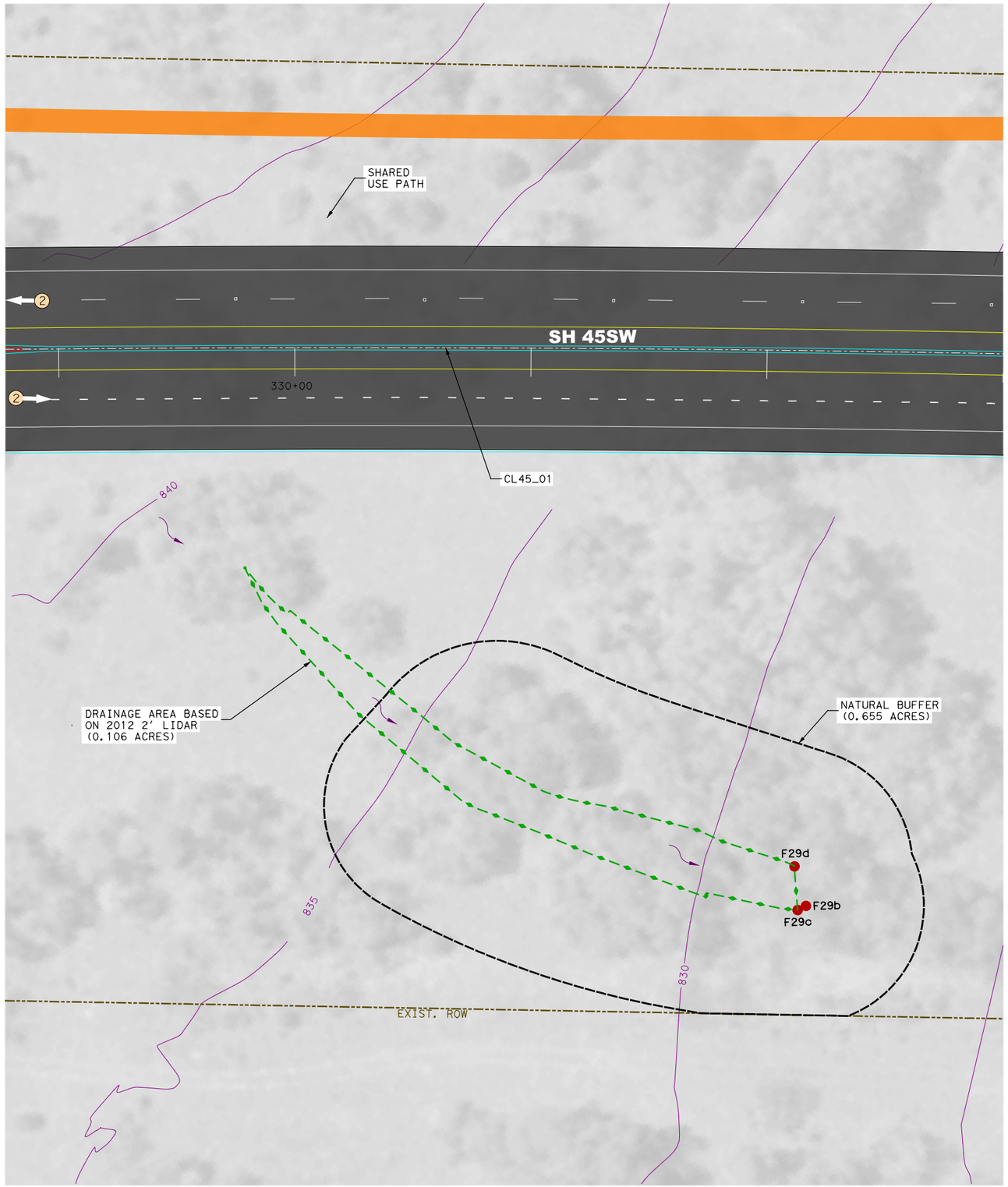
Texas Department of Transportation®

DATE: 11/25/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F55
DRAINAGE DETAILS

11/25/2014
P:\8140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 5.dgn



NATURAL BUFFERS

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0 100′ 200′
SCALE IN FEET

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SH 45SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

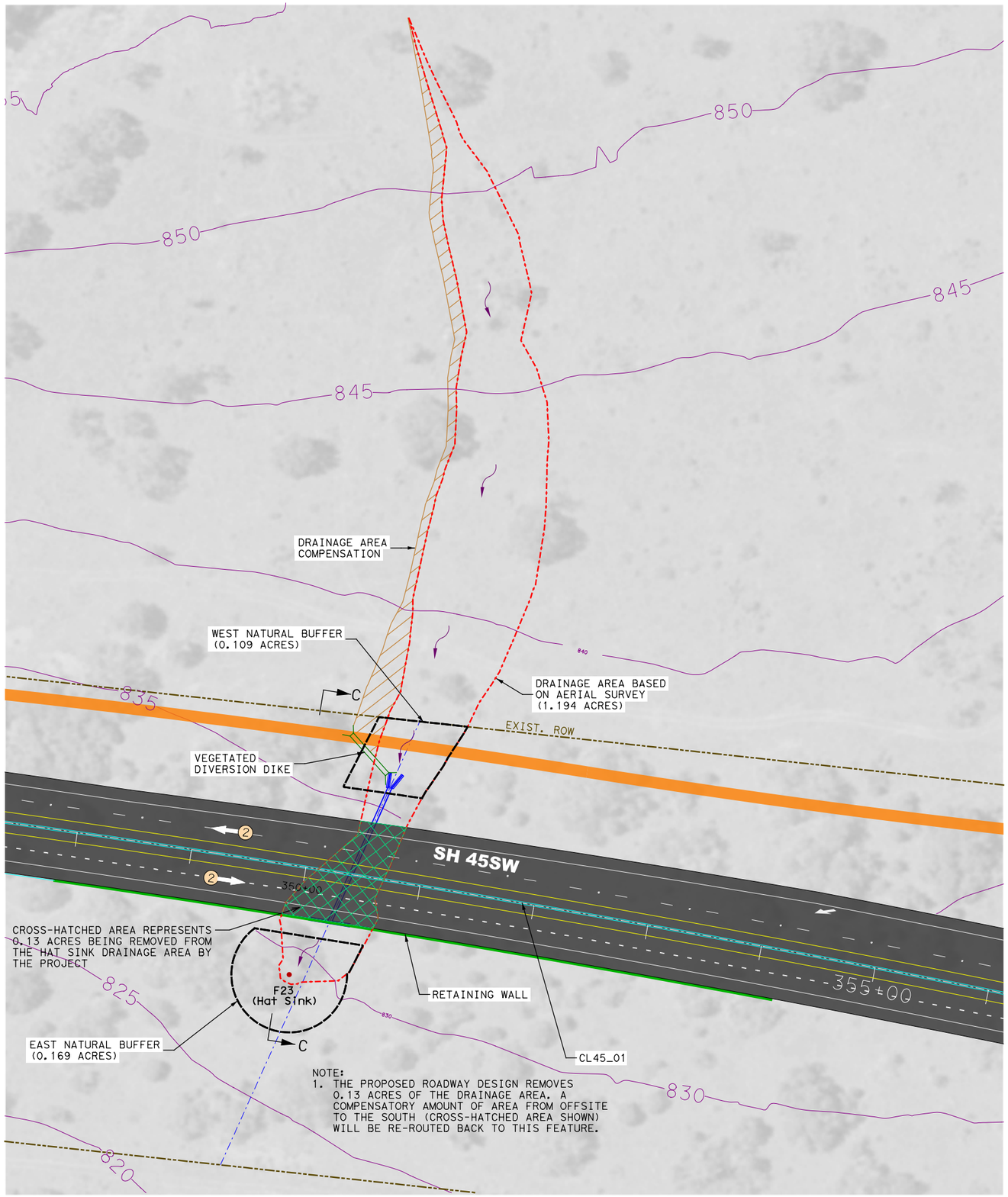
Texas Department of Transportation®

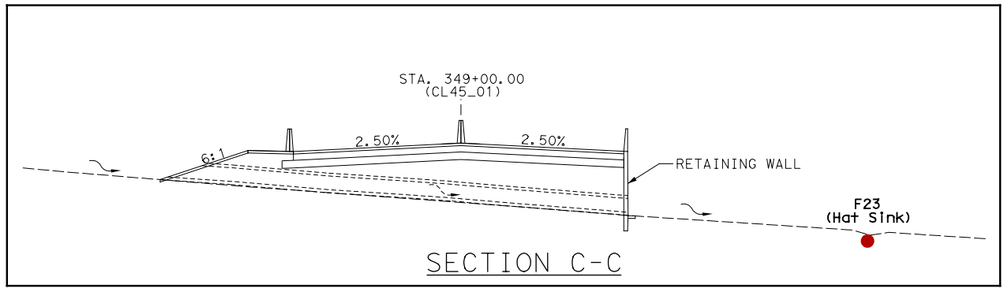
DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES
F29b, F29c & F29d
DRAINAGE DETAILS

10/27/2014
P:\8140403\div\planSht\Schematics\DETAIL SHEET 6.dgn





SECTION C-C

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

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0 50′ 100′
SCALE IN FEET

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

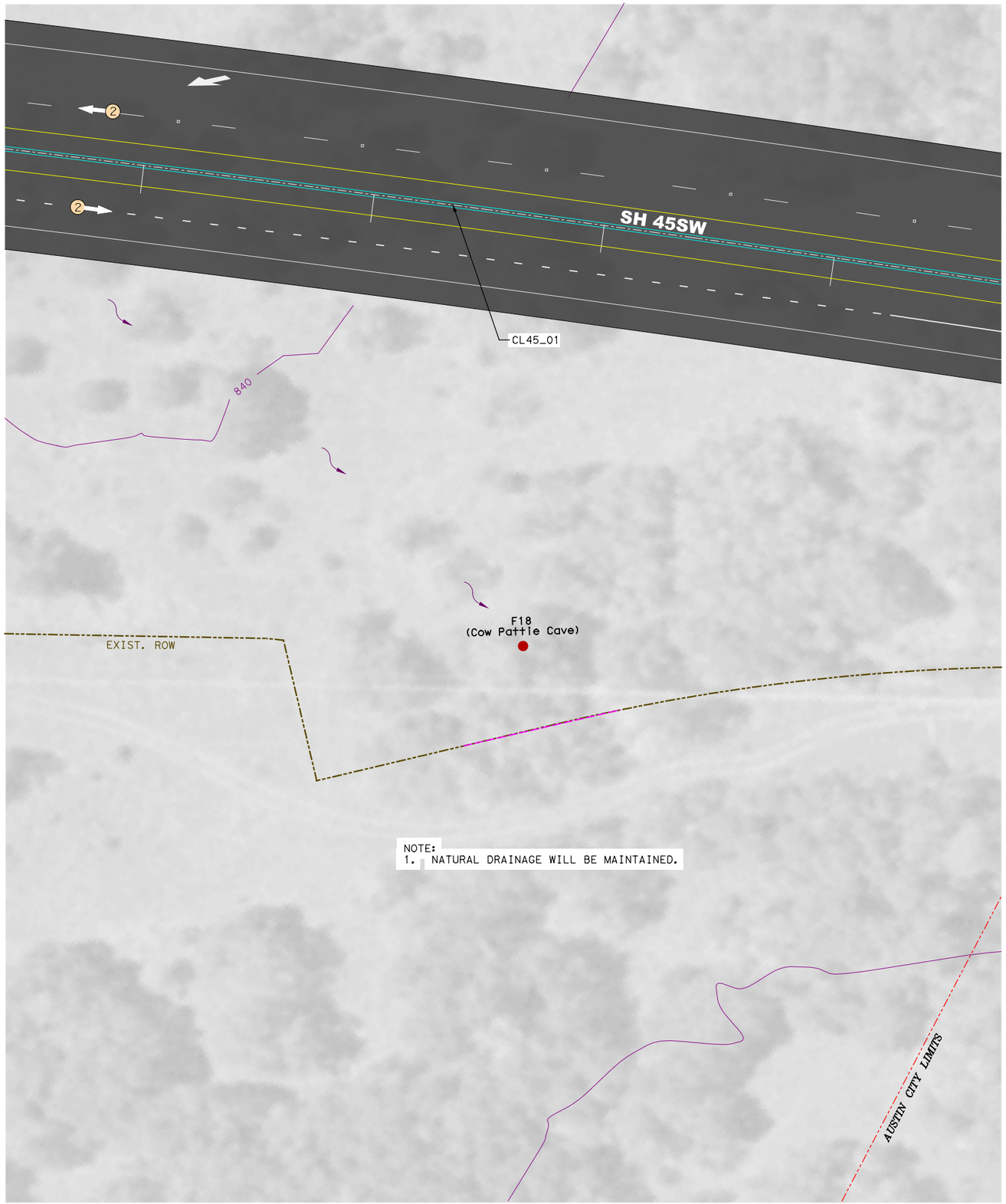
SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F23
HAT SINK
DRAINAGE DETAILS

10/27/2014
P:\8140403\div\planSht\Schematics\DETAIL SHEET 7.dgn



NOTE:
1. NATURAL DRAINAGE WILL BE MAINTAINED.

0 100′ 200′
SCALE IN FEET

CAVE GATE CONSTRUCTION

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9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

INTERIM REVIEW

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F18
COW PATTIE CAVE
DRAINAGE DETAILS

10/22/2014
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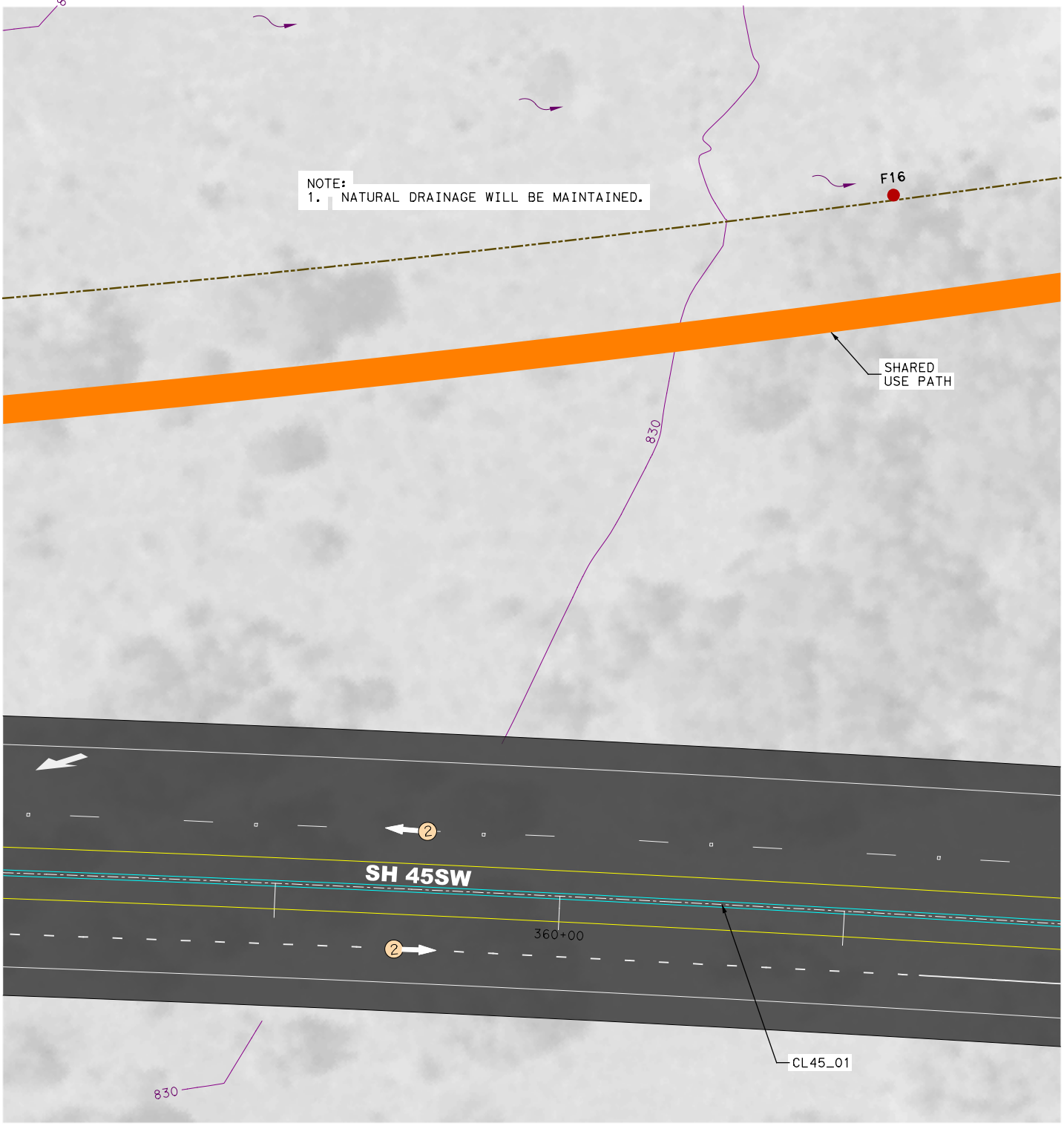

0 25′ 50′

SCALE IN FEET

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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW ENVIRONMENTAL STUDY

SH 45SW PRELIMINARY SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F16 DRAINAGE DETAILS

10/22/2014
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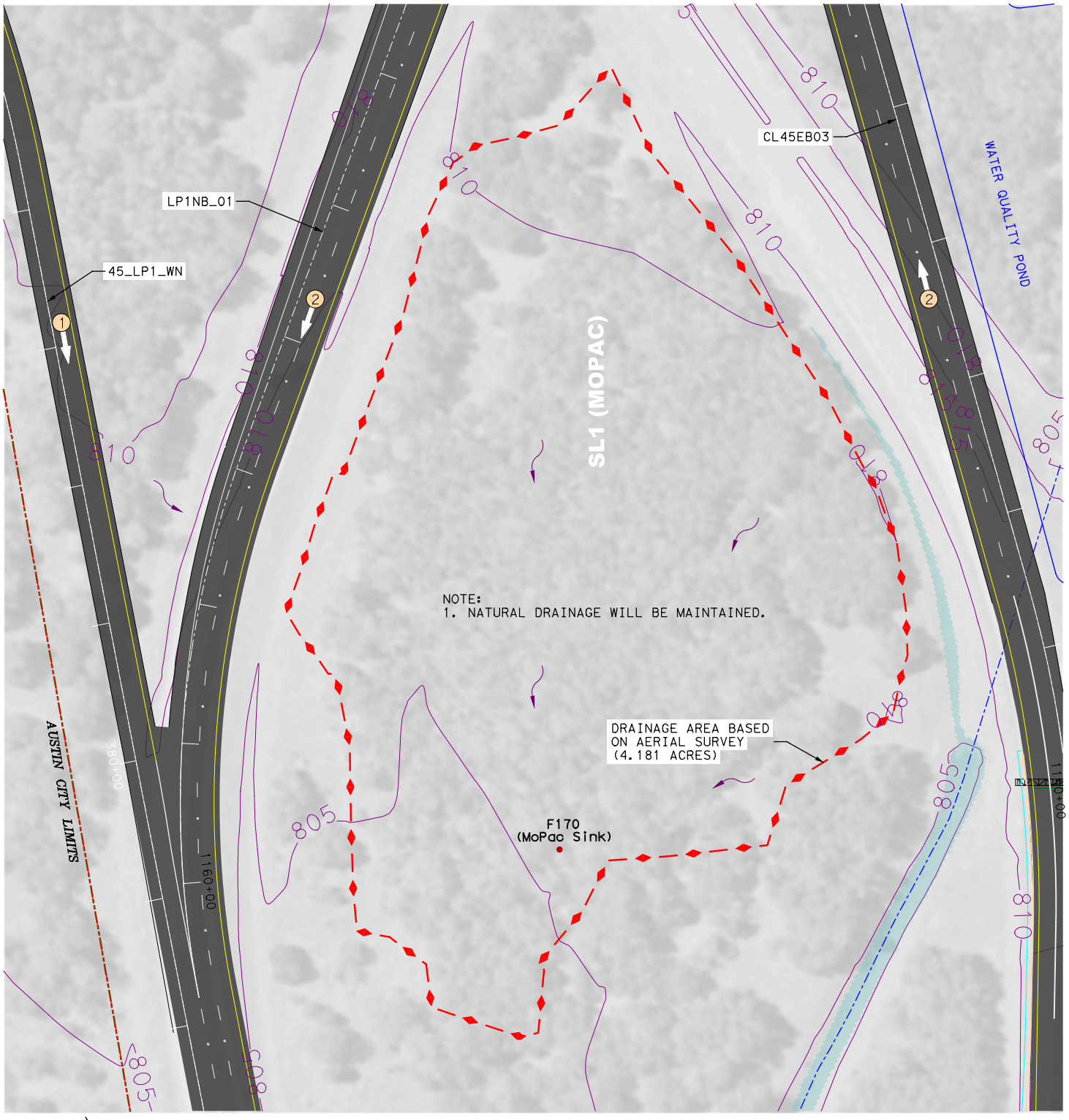

0 50′ 100′

SCALE IN FEET

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CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW

ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES F170
MOPAC SINK
DRAINAGE DETAILS

10/22/2014
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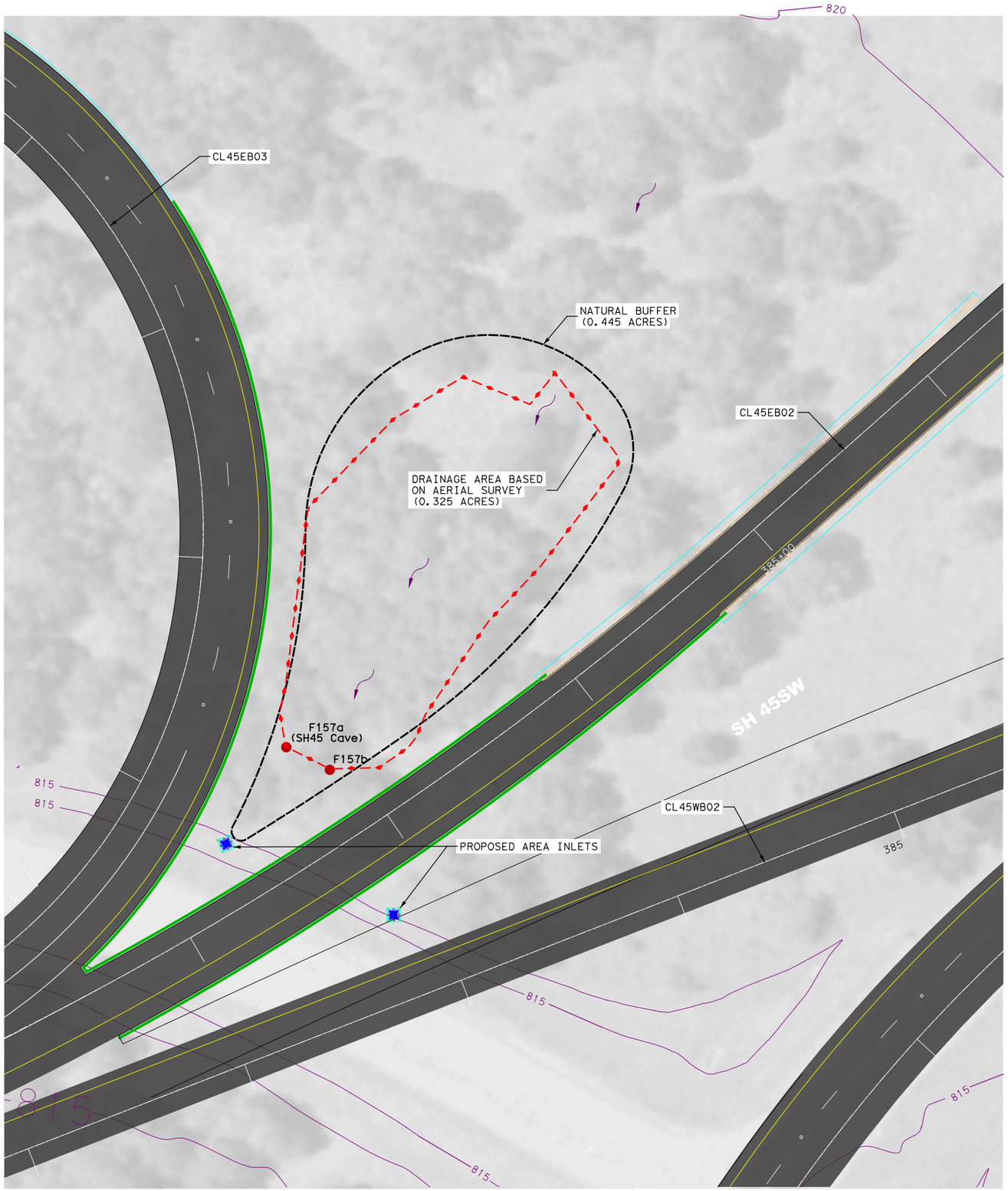

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0 100′ 200′
SCALE IN FEET

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES
F157a (SH45 CAVE) & F157b
DRAINAGE DETAILS

10/27/2014
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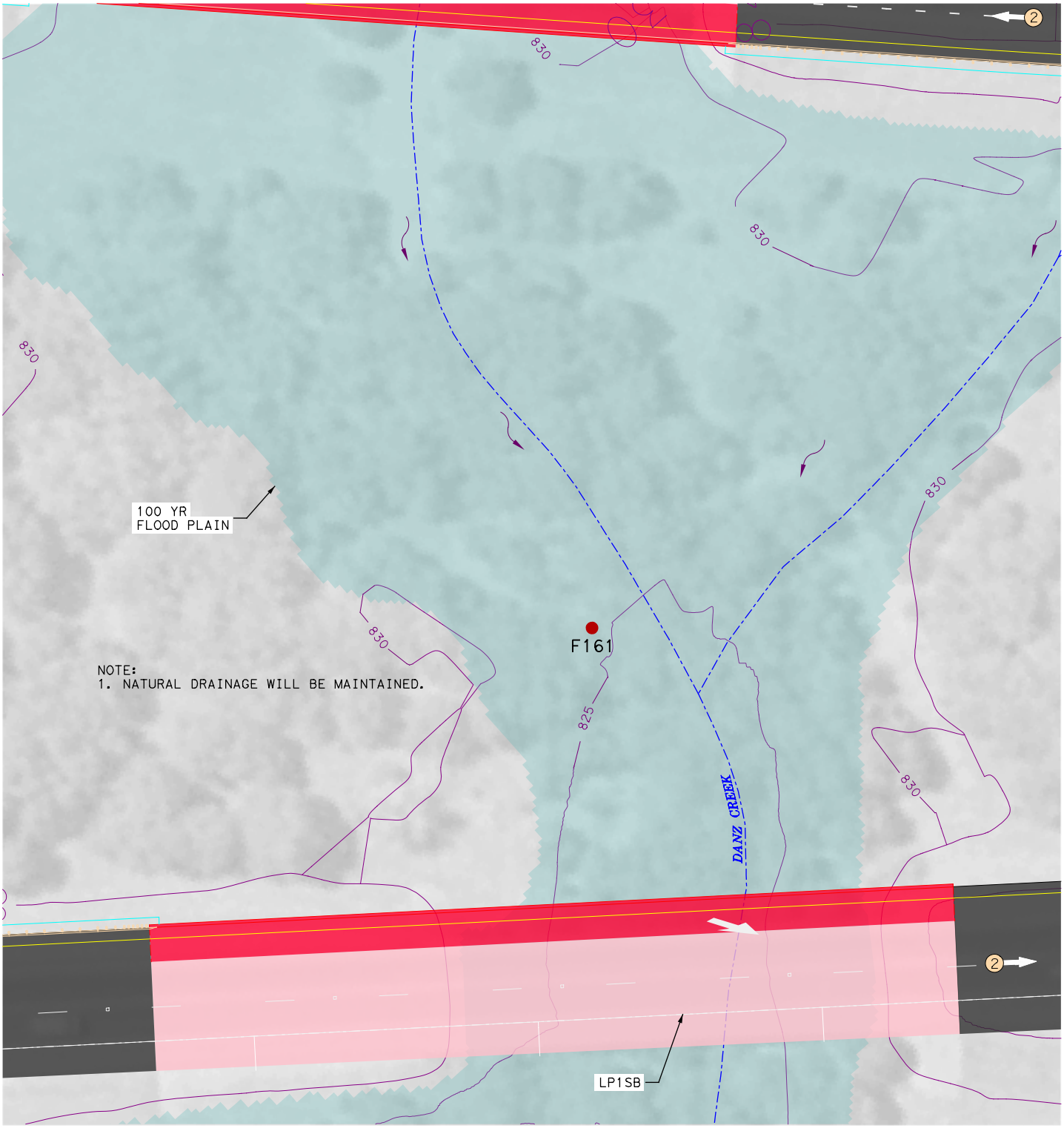

NOTE:
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0 25′ 50′
SCALE IN FEET

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FIRM #587

Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F161
DRAINAGE DETAILS

10/22/2014
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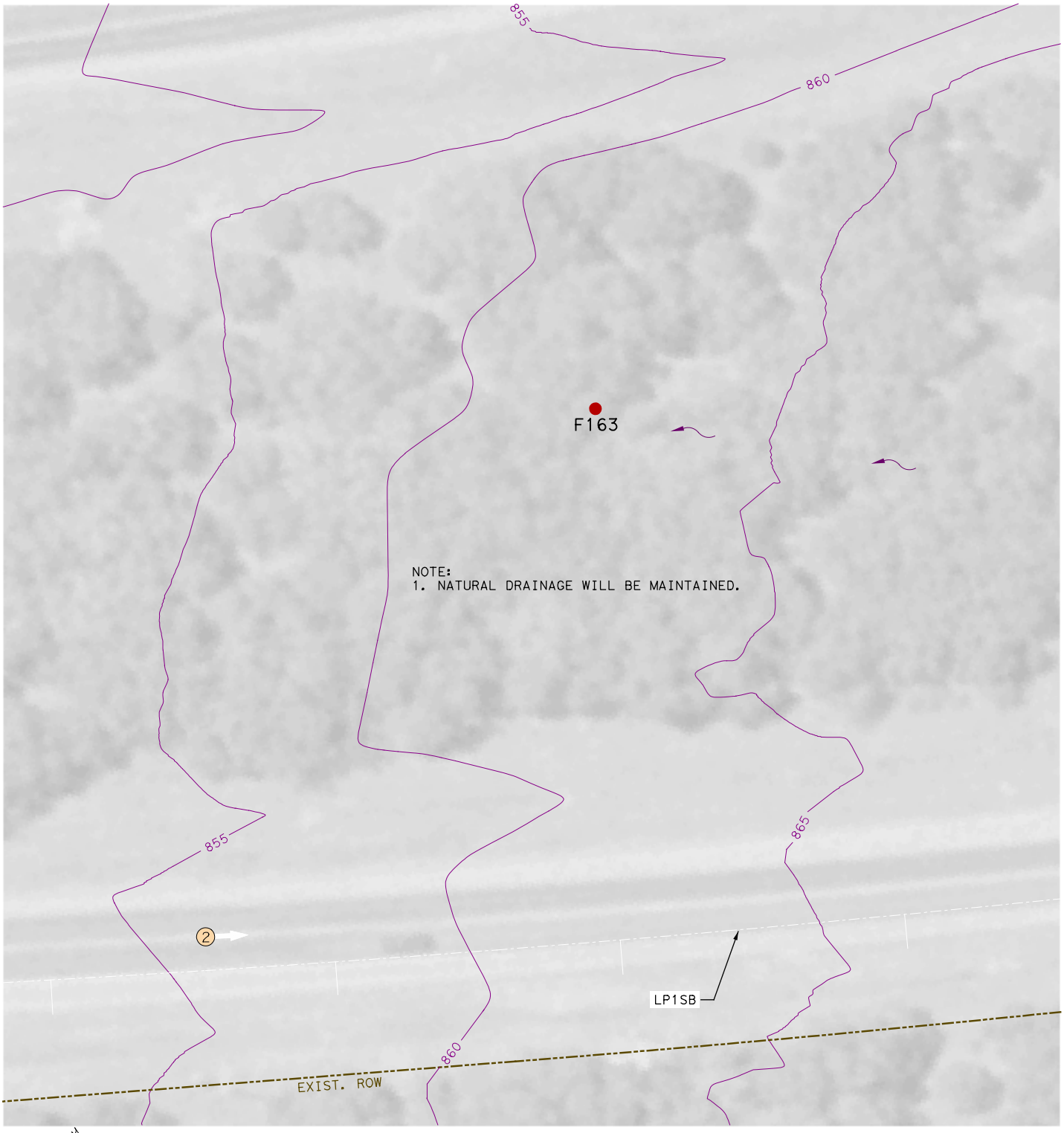

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DATE: 10/22/2014

SH 45SW

ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F163
DRAINAGE DETAILS

10/22/2014
P:\8140403\dlv\planSht s\Schematics\DETAIL SHEET 12.dgn

Appendix C: Summary of Texas Highway Hazardous Spill Statistics

Texas Department of Transportation

MEMO

February 12, 2014
(Revised April 25, 2014)

To: Carlos Swonke, P.G.
Director of Environmental Affairs

Through: Rodney Concienne, P.G.
Branch Manager, ENV-HMM

From: David Morley, P.G.
Environmental Specialist, ENV-HMM

Subject: AUS SH45 SW (CSJ 1200-06-004) – Travis County Spill Data Evaluation

Summary

The Texas Department of Transportation (TxDOT) is in the advanced planning stages of the proposed 3.5-mile section of State Highway 45 Southwest (SH45 SW; CSJ 1200-06-004). When completed, the proposed project will connect MoPac South to FM1626 in Travis County. Previously proposed project development in this area generated concern among several groups regarding the potential impacts to the Edwards Aquifer. The City of Austin (COA) Watershed Protection Department completed a dye trace study in 2010 to simulate accidental spills in selected portions of the proposed SH45 SW project area. COA published the results of the dye trace study in a report dated October 2012, and they concluded that "an accidental spill from SH45 SW and MoPac South intersection area can be expected to recharge into the Edwards Aquifer and initially arrive at Barton Springs within two to four days under high aquifer discharge conditions. Slower initial arrival times of about three weeks can be expected under drought conditions, on the basis of previous studies..." In response to the community's sensitivity to potential future impacts to the Edwards Aquifer resulting from possible accidental spills from vehicles traveling along SH45 SW and a desire to plan for the implementation of appropriate measures during highway construction and operation to protect the aquifer, TxDOT compiled and analyzed roadway spill data from federal, state, county, and city databases for the time period of 2003 – 2012 to quantify the probability of an accidental spill of hazardous liquids from mobile sources (i.e., vehicles, tanker trucks, etc.) occurring within this proposed 3.5-mile section of highway. TxDOT calculated that a maximum of 5.6 hazardous liquids spills per billion vehicle miles traveled occurred on one of three existing parkways and highways in Travis County that are most similar to the proposed SH45 SW during 2003 – 2012. One spill occurred only on existing SH45 SE (IH35 to SH130) during its 3.7 operational history with approximately 0.18 billion vehicle miles traveled. No spills occurred on either of the other two analogous parkways or highways over a 10 year period with approximately 2.58 billion vehicle miles traveled.

1 Introduction

The Texas Department of Transportation (TxDOT) is in the advanced planning stages of the proposed 3.5-mile State Highway 45 Southwest (SH45 SW). When completed, the proposed project will connect MoPac South to FM1626. This is a new project that once was a part of the formerly proposed Austin Outer Loop project, which was proposed in the 1980s and consisted of five segments and the extension of MoPac South to intersect the southwest portion of SH45. Three of the segments were completed in the early 1990s, and MoPac South and a small west-to-east portion of SH45 joining MoPac South and FM 1826 were completed in 1995. The currently proposed SH45 SW project is situated on part of the recharge zone of the Barton Springs Segment of the Edwards Aquifer Recharge Zone. As such, the proposed roadway generated concern among several groups regarding the potential impacts to the Edwards Aquifer (a karst limestone aquifer), which is a sole-source water supply, habitat for karst invertebrates and aquatic life, and water supply for the recreational facility at Barton Springs. In 1989 in response to the former Austin Outer Loop project, a lawsuit was filed against TxDOT by Save Our Springs (SOS) and Save Barton Creek Association (SBCA). The Barton Springs/Edwards Aquifer Conservation District (BSEACD) intervened on the lawsuit. Through a 1990 settlement consent decree, TxDOT agreed to implement measures that mitigate the potential effects of the proposed highway. Those measures included constructing hazardous material traps and filtration ponds, placing signs to educate the public about the location of the recharge zone along the highways, limiting highway access points and their associated secondary impacts, and completing a study of roadway runoff contamination. In 2010, the City of Austin (COA) Watershed Protection Department completed a dye trace study to simulate accidental spills in selected portions of the area between MoPac South and FM 1626. COA published the results of the dye trace study in a report dated October 2012; and they concluded that "an accidental spill from the SH45 SW and MoPac South intersection area can be expected to recharge into the Edwards Aquifer and initially arrive at Barton Springs within two to four days under high aquifer discharge conditions. Slower initial arrival times of about three weeks can be expected under drought conditions, on the basis of previous studies" (Hauwert et al., 2004a).

In response to the community's sensitivity to potential future impacts to the Edwards Aquifer resulting from possible accidental spills from vehicles, tanker trucks, etc. traveling along the proposed SH45 SW and a desire to plan for the implementation of appropriate measures during highway construction and operation to protect the aquifer, TxDOT compiled and analyzed spill data for three analogous roadways in Travis County from federal, state, county, and city databases for the time period of 2003 – 2012 to attempt to quantify the probability of an accidental spill of hazardous liquids occurring on the proposed 3.5-mile highway and impacting karst habitat and the aquifer. This report summarizes these activities and the conclusions.

2 Spill Data Compilation and Analysis

TxDOT compiled roadway hazardous materials spill data for mobile sources for the period of record 2003 – 2012, a period spanning ten years, from the following federal, state, county, and city databases:

- U.S. Department of Homeland Security and U.S. Coast Guard, Nation Response Center (NRC) Emergency Response Notification System (ERNS) Database
- U.S. DOT - Hazardous Materials Incident Report Subsystem (HMIRS) of the Pipeline and Hazardous Materials Safety Administration (PHMSA) Hazardous Materials Information System https://hip.phmsa.dot.gov/analytics SOAP/
- U.S. DOT - Bureau of Transportation Statistics (BTS) http://www.rita.dot.gov/bts/data_and_statistics/databases
- National Transportation Safety Board (NTSB), http://www.ntsb.gov/investigations/reports_hazmat.html

- TCEQ Spill Reports Database
- TxDOT Crash Records Information System (CRIS) database is managed by the Traffic Operations Division, Crash Records Section of TxDOT.
- City of Austin (COA) Fire Marshall and Travis County Fire Marshall (these data are stored in two databases); the National Fire Information Reporting System (NFIRS), http://www.nfirs.fema.gov/documentation/reference/; and the Austin Fire Department (AFD) Computer-Aided Dispatch (CAD).

These databases reflect reports from first responders to vehicular accidents where hazardous materials were spilled. Of these only the NRC-ERNS, USDOT-PHMSA, TCEQ Spill Report, and TxDOT's CRIS databases provided usable data that contained sufficient location and spill record information for the purposes of this study. The USDOT-BTS, NTSB and COA databases did not provide usable data, as they contained only statewide-level data, lacked data for Travis County, or lacked sufficient structure and detail to be electronically queried. Visiting governmental offices to conduct research was beyond the scope of this project. The assumption is that the historic data from the usable sources will represent potential future events, at least from a statistical perspective. The usable data were sorted according to the following attributes:

- Identification (ID) - internal identification of spill location
- Year – year spill occurred
- Location – location of spill
- Latitude and Longitude – latitude and longitude of spill location
- Type of Material Spilled – solid, liquid, gas, unknown
- Substance Spilled – fuel, gasoline, sewage, etc.
- Volume – gallons of spill material
- Source of Data – agency from which data was acquired

Data containing sufficient geospatial references, such as latitude/longitude, street address, road intersection, etc., were entered into data tables. The data tables were then used to create a shapefile for each of the four usable data sources in TxDOT's graphic information system (GIS) using ArcGIS 10. The four shapefiles were then consolidated into a single shapefile.

In order to conservatively estimate the number of spills per vehicle-mile traveled (VMT) on roadways in Travis County analogous to the proposed SH45 SW during 2003 - 2012, TxDOT included reported mobile source spills of hazardous liquids regardless of volume. Approximately 23 percent of the data (39 out of 172 records) did not include spill location data sufficient to locate it on a map. In these cases, the data, if of sufficient quality, were used to develop county-wide spill statistics. The details of the statistical analysis of the data are presented later in this report.

3 Traffic Volume Statistics/Vehicle Miles Traveled

In order to analyze potential traffic volumes on the proposed SH45 SW, TxDOT acquired and evaluated traffic volume data, specifically in the form of current annual average daily traffic (AADT) counts, for similar existing highways and parkways in Travis County for 2012. AADT is a measure of the total volume of vehicle traffic of a segment of highway or road for a year divided by 365 days. It is a useful and simple measurement of how busy the road is. AADT data are collected for multiple twenty-four hour periods. The counts are done during the non-summer weeks; excluding Fridays, Saturdays, Sundays, and holidays. The AADT typically includes

both directions and frontage roads, if applicable; however, for this analysis only main lane data for year 2012 were used. A Weighted 2012 AADT was calculated by multiplying current AADT values by length of road segment, summing these weighted values, and then dividing this sum by the sum of road segment lengths. The Weighted 2012 AADT can be converted to daily vehicle miles traveled (2012 DVMT) and annual vehicle miles traveled (2012 AVMT). DVMT is calculated by multiplying the Weighted AADT by the length of the highway or parkway segment, and AVMT is the DVMT multiplied by 365 days per year.

In addition to the 2012 AADT count, TxDOT also queried and analyzed its roadway data management system to identify sections of existing highways and parkways in Travis County that have design characteristics and functional classifications most similar to the proposed SH45 SW. Once these were identified, then the traffic volume data for these analogous sections of highway and parkway were compiled and analyzed.

Based on the above listed criteria, the most analogous highways and parkways in Travis County to the proposed SH45 SW were identified and the traffic volume for each compiled. The three most analogous highways/parkways are existing SH45 (from RM 1826 to MoPac South), existing SH45 SE (from IH 35 to SH 130), and State Loop 360. A summary of the Weighted 2012 AADT, 2012 DVMT, and 2012 AVMT data for each analogous highway and parkway is presented in Table 1.

Table 1: Summary of Weighted 2012 AADT, DVMT and AVMT Data for Travis County Highways/Parkways Most Analogous to the proposed SH45 SW

Analogous Highway or Parkway	Length (miles)	Weighted 2012 AADT (vehicles per day)	2012 DVMT (vehicle-miles)	2012 AVMT (vehicle-miles)
Existing State Highway 45 SE (IH35 to SH130)	11.3	11,803	133,248	48,635,368
Existing State Highway 45 (RM1826 to MoPac South)	2.6	13,509	35,111	12,815,344
State Loop 360	14.0	47,937	671,118	244,958,200

AADT is Annual Average Daily Traffic, which is the total volume of vehicle traffic of a highway or road for a year divided by 365 days.

DVMT is Daily Vehicle Miles Traveled, which is the AADT for each segment highway or parkway multiplied by the length of the highway or parkway segment.

AVMT is Annual Vehicle Miles Traveled, which is DVMT multiplied by 365 days per year.

The 2012 DVMT for the analogous existing SH45 (RM1826 to MoPac South), existing SH45 SE (IH35 to SH130), and State Loop 360 were 35,111, 133,248, and 671,118 vehicle miles traveled, and the 2012 AVMT were approximately 12.8 million, 48.6 million, and 244.9 million vehicle miles traveled.

4 Statistics of Spills 2003-2012

A total of 172 mobile source (i.e., vehicles, tanker trucks, etc.) hazardous materials spill incidents in Travis County were identified for calendar years 2003 – 2012 (a ten-year period of record). A summary of the number of events in the dataset is presented in Table 2. Of the events, 14 spills were of unknown or unrecorded material, 1 comprised solid material, and 13 were gaseous and irrelevant for subsequent analysis. Of the 144 liquid spills, the records for 43 included an estimate of the volume of material spilled.

Table 2: Summary of Travis County hazardous material spill incidents for the period 2003 – 2012

Year	Count	Material			
		Unknown	Liquid (*)	Solid	Gas
2003	12		12 (3)		
2004	11		11 (2)		
2005	19	1	18 (5)		
2006	18		16 (5)		2
2007	14		14 (7)		
2008	13		12 (5)	1	
2009	4		4 (1)		
2010	22	2	18 (2)		2
2011	20	4	14 (6)		2
2012	39	7	25 (7)		7
Total	172	14	144 (43)	1	13

(*) The parenthetical data in the Liquid column gives the number of liquid spills for which spill volume was recorded.

The numbers of events presented in Table 2 were normalized by dividing the entries in each row by the number of spills reported in each year of the study period. In addition, the last row contains percentages for the entire sample. That is, the last row is based on the number of occurrences for each column over the entire period of record. The results of this computation are displayed in Table 3.

Table 3: Percentage of recorded spills by category

Year	Material			
	Unknown	Liquid (*)	Solid	Gas
2003		100.0 (25.0)		
2004		100.0 (18.2)		
2005	5.3	94.7 (26.3)		
2006		88.8 (27.7)		11.1
2007		100.0 (50.0)		
2008		92.3 (38.5)	7.7	
2009		100.0 (25.0)		
2010	9.0	81.8 (9.0)		9.0
2011	20.0	70.0 (30.0)		10.0

2012	17.9	64.1 (17.9)		17.9
Total	8.1	83.7 (25.0)	0.6	7.6

(*) The parenthetical data in the Liquid column gives the proportion of liquid spills for which spill volume was recorded.

For the majority of the years in the study period the number of unknown material spill events was zero or a relatively small fraction of the sample, with the number of events in years 2011 and 2012 being noticeably higher than the other years. The reasons for these increases were not investigated; such an effort is outside the scope of this project. The fraction of spills recorded that were liquid and that included an estimate of volume recorded as part of the reporting process was 25 percent or greater for the majority of years in the study period. Approximately 8 percent of recorded spills constituted solids or gases. Solids are relatively easy to confine to the spill site and gases cannot be confined to the spill site. This result reinforces TxDOT's decision to focus the study on only hazardous liquid spills.

In June 2011, Texas Tech University, under contract to TxDOT, published a report (David B. Thompson, et al, June 6, 2011) that analyzed the occurrence and statistics of hazardous material spill incidents for mobile sources along all Texas highways (not only those in Travis County) for the five-year period of 2002 – 2006, as compiled by TCEQ. The report examined the statistical distribution of hazardous liquid spill volumes. They found that hazardous liquid spills observed on roadways in the entire state during 2002-2006 were distributed according to the following percentiles:

- 50 percent – 60 gallons or less
- 67 percent – 100 gallons or less
- 83 percent – 300 gallons or less
- 90 percent – 820 gallons or less
- 95 percent - 2,500 gallons or less
- 99 percent - 20,000 gallons or less

Therefore, 95 percent of the hazardous liquid spills from mobile sources observed in Texas during 2002 – 2006 were 2,500 gallons or less, and 99 percent of spills were about 20,000 gallons or less.

This statistical distribution includes areas outside of Travis County that typically experience more frequent liquids transportation on roadways, especially associated with commerce occurring in and between large industrial complexes. As such, the percentiles likely represent a conservative (overstated) condition with respect to actual conditions in Travis County. In other words, the same percentiles for Travis County alone would likely reflect smaller spills.

Furthermore, the probability of the occurrence of a spill greater than 10,000 gallons (only half of the 20,000 gallon value mentioned above) is extremely low due in large part to the fact that the amount of hazardous material that may be legally shipped on public highways is regulated by 23CRF§658, and federal highway regulations limit the weight of a motorized cargo vehicle to 80,000 pounds gross weight. This means that a tanker truck is limited to approximately 10,000 gallons of liquid or less depending on the specific gravity of the material (John A. Marler, et al, September 2005). This indicates that a spill of greater than 10,000 gallons would be extremely rare and require, for example, two tanker trucks to be involved in an incident and simultaneously spill. Nonetheless, industry-leading hazardous material traps and filtration ponds will be engineered for the proposed SH45 SW project to more than adequately confine and contain the appropriate worst-case spill volume to ensure adequate protection of the environment.

For the three analogous highways/parkways identified in Section 3, TxDOT calculated hazardous liquid spill rates for the corresponding 2012 AVMT. Our analysis only included main lanes (i.e., no frontage roads, etc.). Because the 2012 DVMT only represented that year and the spill data covered a ten year period (2003 – 2012) for the existing SH45 (RM1826 to MoPac South) and State Loop 360 and a 3.7 year period (May 2009 – 2012) for SH45 SE (IH35 to SH130), the average annual number of spills was calculated by dividing the number of spills by ten and 3.7, respectively. For each analogous highway/parkway, the number of

hazardous liquid spills for 2003 - 2012, average annual number of spills, and number of spills per AVMT are summarized in Table 4.

Table 4: Hazardous Liquid Spills for 2003 – 2012, Average Annual Number of Hazardous Liquid Spills, and Hazardous Liquid Spills per AVMT

Analogous Highway or Parkway	Number of Hazardous Liquid Spills 2003 – 2012(*)	Average Annual Number of Hazardous Liquid Spills	2012 AVMT (vehicle-miles)	Hazardous Liquid Spills per Billion VMT (spills/billion vehicle-miles)
Existing State Highway 45 SE (IH35 to SH130)	1	0.27(*)	48,635,368	5.6
Existing State Highway 45 (RM1826 to MoPac South)	0	0	12,815,344	0
State Loop 360	0	0	244,958,200	0

(*) For SH45 SE the time period is only 3.7 years of the 10-year period, as it was opened to traffic in May 2009.

For the ten year period, and accounting for the 3.7 year period for SH45 SE, the maximum frequency of recorded hazardous liquids spills on the three analogous highways/parkways was 5.6 spills per billion vehicle miles traveled. This equates to no spills on existing SH45 (RM1826 to MoPac South) and State Loop 360 over 10 years with approximately 2.58 billion vehicle miles traveled, and one spill on existing SH45 SE (IH35 to SH130) over 3.7 years with approximately 0.18 billion vehicle miles traveled.

5 Conclusions

1. The 2012 DVMT for the analogous existing SH45 (RM1826 to MoPac South), existing SH45 SE (IH35 to SH130), and State Loop 360 were 35,111, 133,248, and 671,118 vehicle miles traveled, and the 2012 AVMT for the same three roadways were approximately 12.8 million, 48.6 million, and 244.9 million vehicle miles traveled.

2. Records of hazardous material spill incidents for mobile sources on highways and parkways in Travis County for the period of 2003 – 2012 were obtained from four publically available databases. A total of 172 spill incidents were available for analysis. Materials comprising gases, solids, and unknown materials were eliminated from further analysis. The remaining 144 hazardous liquid spill incidents were examined.

3. TxDOT calculated a maximum of 5.6 spills per billion vehicle miles traveled occurred on one of three parkways and highways in Travis County that are most similar to the proposed SH45 SW during 2003 - 2012. One spill occurred only on existing SH45 SE (IH35 to SH130) during its 3.7 operation history with approximately 0.18 billion vehicle miles traveled. No spills occurred on either of the other two analogous parkways or highways over a 10 year period with approximately 2.58 billion vehicle miles traveled.

4. Texas Tech University's June 2011 report indicated that over 90 percent of hazardous liquids spills from mobile sources in Texas for 2002 - 2006 were less than 820 gallons.

6 Additional References

- Marler, John A., Barrett, Michael E., and Malina, Joseph, September 2005, Hazardous Materials Traps Transport Spill Containment for Stormwater Pollution Prevention along Texas Highways. Center for Research in Water Resources, Bureau of Engineering Research, The University of Texas at Austin, J.J. Pickle Research Campus, Austin, TX 78712. Technical Report, CRWR 05-06.

- Thompson, David B., Morse, Audra, and Acker, Jenna, June 6, 2011, Analysis of the Occurrence and Statistics of Hazardous Materials Spill Incidents along Texas Highways and Suggestions for Mitigation of Transport-Related Spills to Receiving Waters. Center for Multidisciplinary Research in Transportation, Department of Civil and Environmental Engineering, Texas Tech University, P.O. Box 41023, Lubbock, Texas 79409-1023. Research Report Number 0-5200-1, Project Number 0-5200.

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Potential for Impacts to Rare and Endangered Karst Invertebrates from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties Texas

CSJs 1200-06-004 and 1200-07-001

Prepared for

Texas Department of Transportation
Environmental Affairs Division

Prepared by

Cambrian Environmental

and

SWCA Environmental Consultants

SWCA Project No. 27070.02

November 2014

POTENTIAL FOR IMPACTS TO RARE AND ENDANGERED KARST INVERTEBRATES FROM THE PROPOSED STATE HIGHWAY 45 SOUTHWEST PROJECT, TRAVIS AND HAYS COUNTIES TEXAS

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As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

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Attachment B - The Identification of *Texella* from Barker Ranch Cave No. 1, Travis Co., Texas

INTRODUCTION

Central Texas is an internationally-recognized hotspot of biodiversity due largely to cavernous habitat developed within the Balcones Escarpment. This diversity includes sixteen species of karst invertebrates including cave-adapted beetles and arachnids that have been listed as endangered by the U.S. Fish and Wildlife Service (USFWS). Seven of the endangered taxa are endemic to Travis and Williamson counties. These species occur nowhere else on the planet and the karst outcrop in which their habitat occurs is threatened by the rapidly expanding communities of the IH-35 corridor. In an attempt to balance development impacts with conservation, Regional Habitat Conservation Plans (RHCPs) have been developed in both Travis and Williamson counties. These plans, coordinated between local governments and the USFWS, have successfully protected dozens of known locations not only for the endangered taxa but for many of the other rare cave-adapted species who share the same habitat and who might otherwise become candidates for endangered status.

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (CTRMA) are currently in the planning stages of the proposed State Highway (SH) 45 Southwest (SW) transportation project. The proposed project occurs within the Balcones Escarpment in a geographic region known to be occupied by 45 species of rare and endangered karst invertebrates. The purpose of this report is to assess the potential effects of the project on any of these species, evaluate if take of endangered taxa is likely to occur, and if the proposed project is likely to jeopardize the continued survival and recovery of the species.

The project would extend a current segment of SH 45 from the southern terminus of State Loop 1 (MoPac) to Farm-to-Market Road 1626 (FM 1626) through Travis and Hays Counties. The project would also include improvements to adjacent segments of the above-mentioned roadways and to Bliss Spillar Road and Old Bliss Spillar Road at intersections (see Figures 1 and 2). The length of this extension is about 3.5 miles. The proposed project consists of construction of a four-lane roadway within state-owned ROW that is generally 425 to 575 feet wide and totaling approximately 309 acres.

ECOLOGICAL SIGNIFICANCE OF KARST INVERTEBRATES

Troglobites are obligate cave-dwelling organisms that include more than 1,200 species worldwide (Barr 1968). They are characterized by a number of anatomical and physiologic adaptations to cave life collectively referred to as troglomorphy. Troglomorphic characters include loss of pigment and sclerotization (thickness of the exoskeleton in invertebrates), reduction or loss of eyes, elongation of appendages, lengthened life span, modified fecundity, and metabolic adaptation to nutrient-poor habitat conditions. The cave environment is relatively monotonous compared to surface invertebrate habitats and is characterized by stable temperatures close to the mean surface temperature, constant near-saturation humidity, low evaporation rates, and the absence of photosynthetic nutrient production. Photos 1 through 4 illustrate troglomorphic characteristics of central Texas cave fauna. These specimens are not from the SH 45 project area.

Due to the lack of light for photosynthesis, most cave communities lack primary producers. Instead they rely on nutrient input from the surface ecosystem, and as such they are an extension of the surface ecosystem. Nutrients are introduced into the subsurface in the form of plant detritus washed in by floodwater, roots that penetrate the habitat through cracks in the bedrock, organisms that enter the cave under their own power, and the eggs and waste of trogloxene species such as cave crickets. These types of cave communities are essentially decomposer communities (Culver 1982). Other cave ecosystems have been found to derive nutrients from chemoautotrophs that produce energy by breaking chemical bonds in sulfur minerals. No evidence of this process playing a significant role in the ecology of Central Texas terrestrial troglobites has been found however. As a result of adaptation to this low-energy environment,

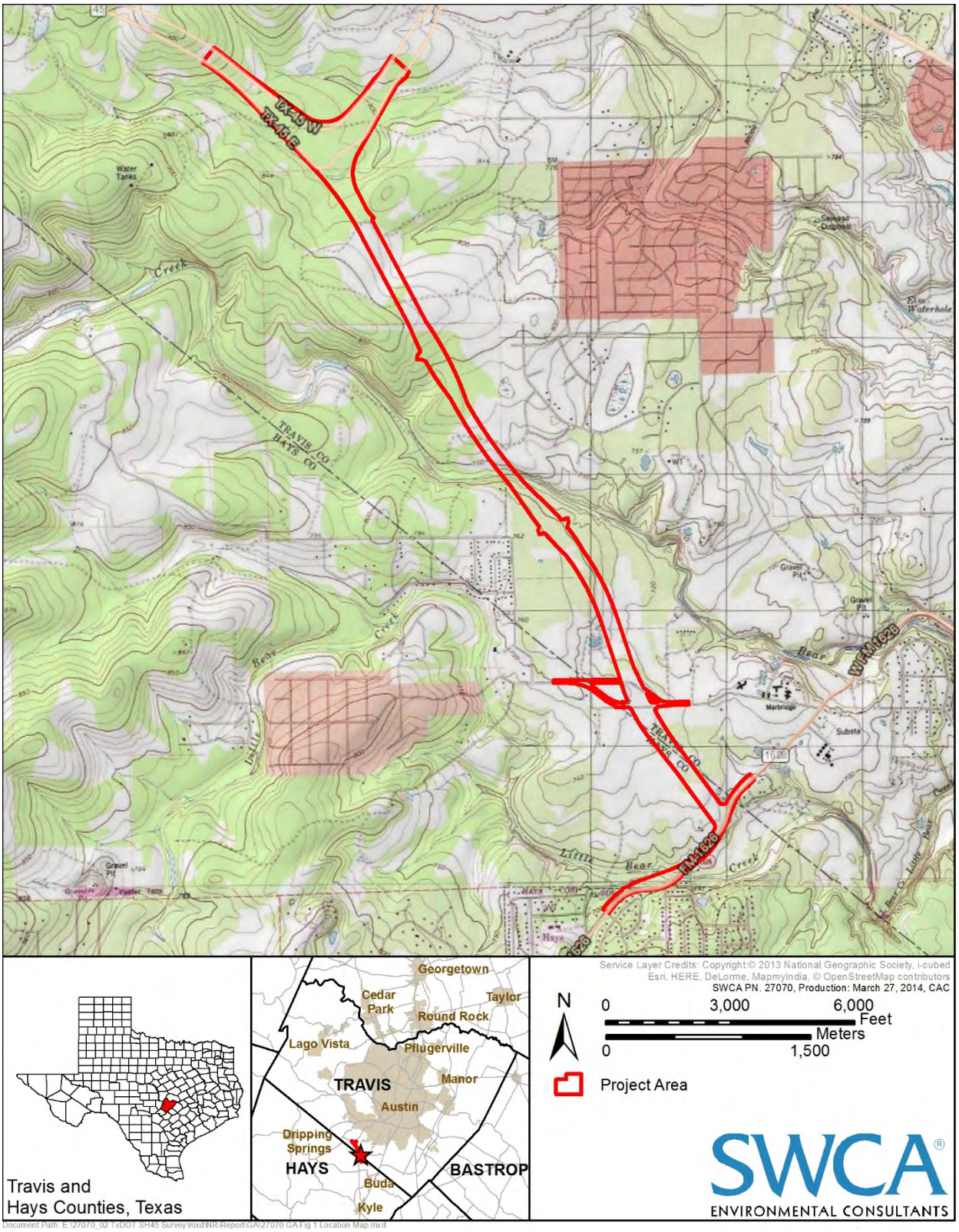


Figure 1. Project location.

many troglobites are K-selected (Culver 1982). K-selected species are characterized by delayed reproduction, increased longevity, smaller total egg production, and larger egg size.

The origin and geographic distribution of troglobites have important general implications for researchers of evolutionary biology (Holsinger 1988). Study of cave organisms has long been of interest because of the regressive evolutionary traits associated with troglomorphy that are shared by a wide variety of taxa. Regressive evolution is especially significant to the field of evolutionary biology because of the possibility that it results from conditions under which the accumulation of neutral mutations (genetic drift) dominates over environmental selection pressures in term of their influence on the composition of the genome (Culver 1982).

Photograph 1. The vestigial eye of this central Texas *Rhadine* sp. beetle is an example of regressive troglomorphic traits exhibited by cave-adapted fauna. This specimen was not from the SH 45 project area.

Many troglobitic species are considered to be relicts persisting in subsurface refugia long after their surface ancestor species abandoned their geographic region due to climate change (Barr 1968). Most terrestrial troglobites are thought to have evolved from a surface ancestor that was pre-adapted for cave life because it belonged to a species adapted to living in cool, moist soil or leaf-litter. Climatic oscillations, such as those during the Pleistocene, periodically brought suitable habitat conditions for these species into and out of geographic areas south of the glacial maxima. During warmer, drier intervals populations inhabiting caves and sinkholes were able to survive in isolated pockets whereas other populations were forced to migrate to suitable habitat conditions or go extinct. The resulting geographic isolation, reduced population size, and restriction of gene flow combined with troglomorphic selection pressures to produce endemic species. Most of the local endemic karst invertebrates are thought to have arisen through similar processes (Barr 1968, Cokendolpher 2004, Culver 1982, Holsinger 1988, Mitchell and Reddell 1971).

Centers of troglobitic biodiversity in the United States include Texas, the southeast (Appalachian Mountains, Cumberland Plateau, Central Basin of Tennessee, and the Bluegrass and Mammoth Cave regions of Kentucky), and the Sierra Nevada foothills of California. Among all of these areas, Texas ranks second in terrestrial troglobite diversity (Peck 1988). The diversity of troglobitic fauna in Central Texas caves has been attributed in part to the latitude being south of the maximal advance of glacial ice and north of the stable tropical zone. Caves were never covered by ice during Pleistocene glaciations as were caves in northern latitudes and the climatic oscillations associated with climate change continuously

Photograph 2. Surface-adapted (left) and cave-adapted (right) spiders of the genus *Cicurina* show dramatic differences in eye development. Whereas the surface species *Cicurina varians* (left) has the normal 8-eyed configuration, the cave-adapted species (right) lacks even the vestigial eyes exhibited by many troglobites. Specimens similar to these have been collected from several features within the right of way.

Photograph 3. The endangered Bone Cave harvestman (*Texella reyesi*) exhibits elongated appendages and eyes that are reduced in number and size. Specimen pictured is from Williamson County and has been partially dissected (legs removed for clear view of cephalothorax profile). No *Texella* spp. have been detected within the right of way.

Photograph 4. The millipedes of the genus *Speodesmus* lack eyes and pigment and exhibit elongated legs. Specimens similar to this one have been collected within the right of way.

brought potential colonizers into and out of contact with cave habitats. The composition of the troglobitic community indicates that glacial periods were more important to producing the overall biodiversity in Texas caves. Eleven genera of troglobites share affinities with northern and northeastern fauna, whereas only three genera share affinities with tropical and subtropical fauna (Mitchell and Reddell 1971). Tooth Cave, which has the highest level of biodiversity known in any Texas cave, is located approximately 15 miles north of the project area.

REGULATORY CONTEXT

Seven species of invertebrates known only from caves in Travis and Williamson counties, Texas, are listed by the USFWS as endangered species under the provisions of the Federal Endangered Species Act of 1973, as amended (ESA). The seven species are Bee Creek Cave harvestman (*Texella reddelli*), Bone Cave harvestman (*Texella reyesi*), Tooth Cave pseudoscorpion (*Tartarocreagris texana*), Tooth Cave spider (*Neoleptoneta myopica*), Tooth Cave ground beetle (*Rhadine persephone*), Kretschmarr Cave mold beetle (*Texamaurops reddelli*), and Coffin Cave mold beetle (*Batrisodes texanus*). The USFWS considers potential threats to these species to include: destruction and/or deterioration of habitat by commercial, residential, and road construction; filling of caves; loss of permeable cover; contamination from such things as septic effluent, sewer leaks, runoff, and pesticides; predation by and competition with non-native fire ants; and vandalism.

Section 9 of the ESA prohibits the "take" of threatened and endangered species; take is defined as actions that "harass, harm, pursue, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Generally, the USFWS considers modification of regularly occupied endangered species habitat to constitute "harm" and, therefore, a violation of the ESA. In the case of the cave invertebrates, the USFWS may consider any unauthorized activities that result in the realization of any of the afore-mentioned threats to be "take" and a violation of the ESA.

Generally, habitat requirements for these species include subsurface void spaces in permanent darkness, moisture input sufficient to maintain high humidity, and a source of organic material from the surface. Organic material can be washed into the void by surface water or brought into the void by small mammals or trogloxene species such as cave crickets (*Ceuthophilus secretus*) and daddy longlegs (*Lieobunum townsendii*). Features that can host these organisms include caves, enlarged rock joints, sinkholes, and smaller karst conduits. All seven species are believed to be restricted to karst features within the Edwards Limestone and associated formations.

In 1992, the USFWS commissioned a study that delineated four geographic zones according to their potential to provide suitable habitat for karst invertebrates (Veni 1992). The zones were based on lithology, distributions of known caves and cave fauna, and geologic controls on cave development. The zones were delineated as follows:

Zone 1: Areas known to contain endangered cave species.

Zone 2: Areas having a high probability of endangered or other endemic invertebrate cave fauna.

Zone 3: Areas that probably do not contain endangered cave species.

Zone 4: Areas that do not contain endangered cave species.

As can be seen in Figure 2, the proposed project would occur almost entirely within areas designated as Zone 3. Areas delineated as Zone 4 occur along the southern end of the project area.

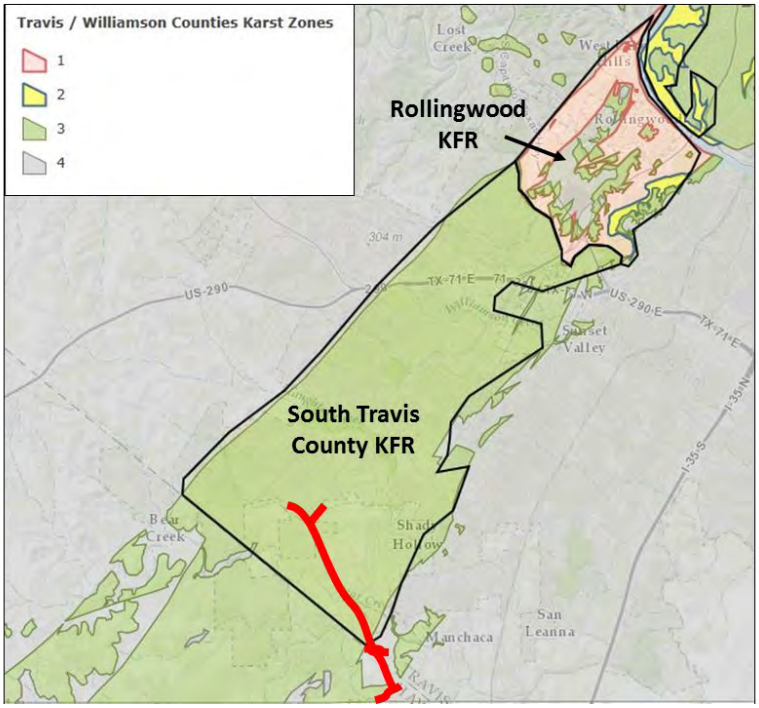


Figure 2. USFWS Karst Zones of the project area.[1]

The study also discussed the overall karst geography of the Austin region as well as potential geologic and geographic barriers to karst invertebrate dispersal and limits to their distribution. Distinct Karst Fauna Regions (KFRs) were delineated within Travis, Williamson, Hays, and Burnet counties based on "geologic continuity, hydrology, and the distribution of 38 rare troglobites" (USFWS 1994:67). South of the Colorado River within Travis County they include the Rollingwood and South Travis County KFRs. Figure 2 depicts the proposed project area in relation to the KFRs and karst zones. The project would occur within the South Travis County KFR which was not considered to have the potential to contain any of the endangered fauna until the publication of the 5-year review for the Bone Cave harvestman in 2009. While the South Travis County KFR was known to contain extensive terrain containing habitat for karst species, including at least two species of concern (SOC) as identified under the Balcones Canyonlands Conservation Plan (BCCP), only one of the listed invertebrate species (the Bee Creek Cave Harvestman, *T. reddelli*) had been known to range south of the Colorado River and it is not known to range south of Barton Creek.

ORIGIN OF HABITAT IN THE PROJECT AREA

Habitat for cave-adapted fauna in the Balcones Escarpment in Central Texas is the byproduct of the evolution of the Edwards Aquifer, a hydrogeological process acting across approximately 20 million years of evolutionary time. The paleoaquifer developed along the structural grain imparted by the Balcones Fault Zone and the primary porosity of the Edwards Limestone which is the host rock for the great majority of caves in the area. During the Miocene, as the ancestral Gulf of Mexico was subsiding to the southeast, the escarpment was created along a belt of weakness where episodic faulting produced more than 1,000 feet of displacement. The resultant Balcones Escarpment is essentially a fault-line scarp

[1] Modified from the on-line Travis and Williamson Counties Karst Zones and Salamander Critical Habitat mapper viewed at: http://www.arcgis.com/home/item.html?id=953ab0462a0c4f2f870c3524e5f12b8e.

consisting of a series of northeast-trending, predominantly normal, nearly vertical, en echelon faults that are down-thrown toward the coast.

In the approximately 20 million years since faulting ceased, drainage systems adjusted to this change in topography by accelerating denudation rates along the escarpment. Erosion was particularly focused on fault scarps with the highest displacement. Acting essentially like a giant head-cut, regional drainage systems stripped more than 900 feet of overlying Comanche and Gulf Series strata away from the topographic break toward the Gulf of Mexico. The top of the Edwards Group Limestones, the dominant cave-forming units in the area, were exposed and had begun to be incised on the San Marcos Platform (a high point in the geological structure) by the middle Miocene on the order of 10 million years ago (Wilson 1956, Ely 1957).

As subsequent portions of the confined aquifer were gradually exhumed by erosion, discrete zones of cavernous porosity became air-filled and were available for progressive colonization by terrestrial fauna (White 2006, White et al. 2009). Being closest in proximity to karst habitats, it was the edaphobitic (soil dwelling) fauna that first entered the subterranean voids. That the troglobite community is descended from paleo-soil and paleo-leaf-litter fauna is apparent from the fact that both communities share the same basic faunal components (Reddell 1994). Bacteria and actinomycetes were followed by protozoa, nematodes, and rotifers. Mites and springtails formed the base of the scavenger/predator community and, in turn, provided a prey base for insects, myriapods, arachnids, and diplurans. It is this last group of animals who followed convergent evolutionary pathways leading to the remarkable diversity of troglobitic fauna now known from Texas caves. Today the descendants of early cave colonists comprise at least 45 species of obligate terrestrial troglobites in the Austin area alone (Reddell 1993, 1994). They are the living descendants of the surface fauna of the late Miocene sheltered for 10 million years by their subterranean habitat.

The potential for karst invertebrate habitat to occur in the project area is directly dependent on the degree of karst development within the underlying bedrock. Caves surrounding the project area are known to contain endemic karst invertebrates. Nearby caves known to contain BCCP SOCs include Flint Ridge Cave, Barker Ranch Cave #1, Lost Oasis Cave, and Ireland's Cave. Not all voids in the Edwards Limestone are occupied by troglobitic fauna, however. While troglobitic fauna are known to inhabit mesocavern habitat (small voids connected to the larger caves and sinkholes through which nutrients are able to enter the subsurface), some mesocaverns are interstitial in nature (essentially sealed off from biological activity). Photograph 5 depicts the interior of an interstitial cavern encountered in a sewer line trench. It was sealed off from other voids in the karst network by secondary mineral growth. All surfaces were coated by speleothem deposits and organic material is absent. Table 1 presents a list of karst invertebrate species known from southern Travis and northern Hays counties including those identified as BCCP SOC.

Photograph 5. Example of an interstitial void formed within the Edwards Limestone. A coating of mineral deposits has biologically isolated the void from other voids in the karst network which may be biologically active.

Table 1. Endemic troglobitic fauna of Travis and northern Hays counties.

Species Name	Number of Cave Occurrences	Description
Spiders		
*Cicurina bandida**	16	BCCP SOC
Cicurina cueva	22+	BCCP SOC
Cicurina ellioti	1	BCCP SOC
*Cicurina redelli **	1	BCCP SOC
Cicurina reyesi	1	BCCP SOC
Tayshaneta "Neoleptoneta" concinna	2	BCCP SOC
*Tayshaneta "Neoleptoneta" devia**	6	BCCP SOC
*Tayshaneta "Neoleptoneta" myopica**	6	Endangered
Eidmannella reclusa	3	BCCP SOC
Pseudo-scorpions		
*Tartarocreagris comanche**	4	BCCP SOC
Tartarocreagris intermedia	1	BCCP SOC
Ground Beetles		
Rhadine austinica	30	BCCP SOC
Harvestman		

Species Name	Number of Cave Occurrences	Description
Texella mulaiki	12+	BCCP SOC
*Texella reddelli**	8	Endangered
*Texella reyesi**	168	Endangered
*Texella spinoperca**	2	BCCP SOC
Mold Beetles		
Millipedes		
Speodesmus N. Sp. 2	6	
*Speodesmus bicornourus**	33	Williamson County RHCP Additional Species
Isopods		
Caecidotea redelli	?	BCCP SOC
Miktoniscus N. Sp.	?	BCCP SOC
Trichoniscinae N. Sp	?	BCCP SOC
Silverfish		
Texoreddellia texensis	100+	
Collembola		
Arrhopalites texensis	7	Williamson County RHCP Additional Species
*Oncopodura fenestra**	5+	Williamson County RHCP Additional Species
Flatworm		
Sphalloplana mohri		BCCP SOC
Ostracod		
Candona sp. nr. stagnalis	?	BCCP SOC
Entotroph		
Mixojapyx reddelli	14	

POTENTIAL FOR RARE AND ENDANGERED KARST INVERTEBRATES TO OCCUR ON THE PROJECT SITE

Determining whether a geographic area is occupied by listed karst invertebrates is inherently difficult. Habitat for the invertebrates can be highly cryptic within the landscape. Cave entrances are often concealed by thick brush or blocked by natural or man-made materials, which have to be removed to make the habitat accessible by researchers. Once accessed, the habitat is a difficult working environment and individuals belonging to listed species are often cryptic within the habitat because they are small (some species are less than 2 mm long), because they occur in small numbers, because they retreat beneath rocks or within inaccessible parts of the cave, or because they enter the humanly accessible part of the cave only on a seasonal basis. Some listed species also have non-listed congeners (other species within the same genus) that occur in the same region. Often these congeners can be difficult to tell apart due to limits in available taxonomic methods. In some instances is can be difficult to tell whether a troglobite recovered from a given cave is a listed species or not. Genetic techniques have been developed for the identification of some listed spiders (Paquin et al. 2003, Hedin 2014, White et al. 2006).

In an attempt to define a due diligence standard that manages the uncertainty inherent to karst studies, the USFWS has developed protocols for determining the presence or absence of listed karst invertebrates (USFWS 2006, 2011, 2014). These protocols provide guidance on when you might be at risk of "taking" a species while conducting karst invertebrate surveys and when it is advisable to have a Section 10(a)(1)(A) permit issued by the USFWS under the ESA to be covered for "take," such as the permit held by SWCA (USFWS Permit No. TE800611). The first step in the due diligence process is to survey the surface area for karst terrain features that may indicate the potential for habitat in the sub-surface. The second step is to investigate any karst terrain features for the potential to contain endangered species habitat. This step often involves excavating sinkholes or potential blocked cave entrances in order to assess the habitat potential. Should potentially suitable habitat be found, the third step is to conduct a presence/absence survey for the species within the cave. This investigation was completed under the terms of the 2011 USFWS protocols which require a minimum of three biological survey before absence of species can be concluded, preferably conducted in at least two suitable collecting seasons. Suitable collecting conditions are defined primarily by the absence of extreme weather conditions including high and low temperatures, and drought and flooding conditions.

Two Cambrian Environmental professional geologists (TX License Nos. 3863 and 10791) who are permitted by the USFWS to conduct karst feature and karst invertebrate presence/absence surveys conducted a karst terrain feature survey within the existing rights of way of SH 45 and MoPac expressway between December 2013 and February 2014. The pedestrian survey was completed where right of entry was granted by walking parallel transects spaced approximately 50 feet apart. Closer spacing was used where vegetation inhibited clear observation. All potential karst features, including depressions, holes, and animal burrows, were carefully examined for evidence of subsurface extent. A number of techniques were used for this effort, including probing with a digging implement to determine the thickness and consistency of fill material and feeling for the presence of air flow, which may indicate the presence of a sub-surface void space. Other techniques included making observations of any notable characteristics of the feature such as the presence of various types of vegetation or a semi-circular burrow mound produced by the activities of small mammals. Our methods also included a detailed literature review of materials relevant to the local caves and karst (see References).

More than 220 individual landscape features were investigated as potential recharge features (See Site Geologic Assessment report). An intensive period of excavation resulted in non-karst designation for approximately 90 percent of the features investigated. Most of the non-karst features were formed within the layer of terra rossa above the bedrock surface and were determined to be the result of burrowing activities of small mammals, stump holes, or excavation scars from ranching activities. Twenty-seven features were determined to be of karst origin and they can be divided into sensitive and non-sensitive categories. The sensitive features include five caves, four sinkholes, and eight solution cavities with the capacity for rapid recharge. See the project Geologic Assessment for full descriptions of all feature investigated.

Prior to this investigation, Flint Ridge Cave was the only karst feature in the right of way known to contain karst fauna. Flint Ridge Cave is one of the most significant caves in Travis County and is identified in the Balcones Canyonlands Conservation Plan as containing two karst invertebrate species of concern. Although the majority of the cave is located on the adjacent City of Austin water quality protection lands, a portion of the footprint occurs approximately 150 feet below the right of way. As a result of this investigation karst fauna have been detected in five additional locations within the right of way three of which are additional locations for BCCP SOC. None of the features were found to contain specimens potentially belonging to endangered karst invertebrates. All features determine to have the potential to be associated with habitat for rare and endangered karst fauna are described in Table 2.

Table 2. Summary of biological surveys of significant features within the SH 45 right of way.

Feature	Description	Biota Survey Methods
F-18 Cow Pattie Cave	Backhoe excavation of the feature formerly known as Cow Pattie Sink has produced a pit measuring approximately 20 feet in diameter and 10 feet deep. Two short sections of crawling cave passage have been opened at different elevations by manual excavation. The upper passage extends horizontally to the southwest for approximately 30 feet. This passage is an upper level drain of the sinkhole formed within a bedding plane occurring between 6 and 9 feet below the surface. The lower passage begins about 4 feet below the upper passage and corkscrews down to a total depth of approximately 15 feet. A crawling passage extends approximately 20 feet to the southwest to a bedrock portal measuring approximately 6 inches in diameter with slight but consistent air flow.	The feature was continuously monitored for karst biota during the excavation process which involved more than a month of field effort for a crew of karst technicians. Active presence/absence surveys were conducted as well as bait trapping. Troglobitic species detected: *Rhadine austinica* *Cicurina bandida* *Speodesmus* sp.
F23 Hat Sink	Backhoe excavation of Hat Sink produced a pit measuring approximately 15 feet in diameter and 10 feet deep. Manual excavation following the backhoe work produced a lower level of the sinkhole reaching a total depth of approximately 15 feet. No open cave passage has been produced although several small (less than 1 foot in diameter) solution cavities extend into the wall of the sinkhole.	The feature was continuously monitored for karst biota during the excavation process which involved more than a month of field effort for a crew of karst technicians. Active presence/ absence surveys were not conducted due to the lack of cave passage. Bait trapping was conducted in two of the solution cavities extending away from the excavation area. Troglobitic species detected: *Speodesmus* sp.
F-64/65	Both caves are formed along the northern upper bank of Bear Creek. Their entrances are located approximately 70 feet apart with F-65 located approximately 12 feet higher in elevation. However, passage associated with each feature extends in the direction of the other raising the likelihood that they are connected. F-65 was the only open cave located within the right of way at the onset of the karst investigation. The entrance passage drops vertically for approximately 4 feet before opening to the southwest to a low wide room measuring approximately 40 feet in diameter. Along the southeastern edge of this room is a drain which, as a result of manual excavation, drops to a total depth of approximately 12 feet below the surface. An open portal measuring approximately 6 inches in diameter extends from the base of the drain for an unknown distance and exhibits consistent air flow. The drain and the entrance passage are aligned with a northeast-to-southwest trending fracture set that connects F-64 and F-64. F-64 was originally	The features was continuously monitored for karst biota during the excavation process which involved more than two weeks of field effort for a crew of karst technicians. Active presence/absence surveys were conducted in F-65 which contains the best troglobite habitat of any feature within the right of way. Bait trapping was conducted in the drain of F-65. Troglobitic species detected: *Rhadine austinica* *Cicurina bandida* *Tayshaneta* sp. possibly *T. sandersi* *Speodesmus* sp. *Texoreddellia* sp.

Feature	Description	Biota Survey Methods
	completely full of rock fragments and soil. Manual excavation has produced approximately 15 feet of low, wide bedding plane belly-crawling passage extending to the northeast toward the drain in F-65. Slight airflow can be felt coming from that direction.	
F-110 Jubilee Cave	Backhoe excavation of the feature formerly known as Jubilee Sink has produced a fracture-controlled pit measuring approximately 12 feet long by 4 feet wide and 8 feet deep. From the base of that pit manual excavation produced a narrow fracture-controlled passage which corkscrews to the southwest dropping vertically to a depth of approximately 15 feet below the surface. Fracture-oriented fissures in the bedrock extend below this point for an unknown distance and exhibit consistent air flow.	The feature was continuously monitored for karst biota during the excavation process which involved more than two weeks of field effort for a crew of karst technicians. Active biota surveys were conducted, but due to the vertical nature of the feature suitable habitat conditions were not encountered (the feature lacks permanent darkness and stable temperature and humidity). Bait trapping was conducted. Troglobitic species detected: *Speodesmus* sp.
F-157a SH 45 Cave	SH-45 cave was originally excavated and described during the original development of the Mo-Pac facility. The entrance had been covered with wooden planks and leaf litter generated in the past two decades had nearly concealed the feature entirely. The cave is highly fracture-controlled resulting in a linear footprint oriented with the northeast-to-southwest trend of a fault that is mapped as occurring just to the south of the cave. The entrance is a vertical shaft measuring approximately 5 feet in diameter. It drops approximately 8 feet to a low, wide belly crawl that extends for approximately 15 feet to the northeast. At that point a hole in the floor drops an additional 4 feet into a linear tube-like room that extends approximately 20 feet to the southwest and 30 feet to the northeast. A drain in the floor of this room near its northeastern terminus drops for an additional 4 feet into a very tight lower chamber with consistent air flow. Additional passage likely occurs beyond this point, but tight working conditions and storm debris precluded additional excavation.	Suitable habitat conditions for troglobites occur beyond the first drop. Active presence/absence surveys were conducted. Bait trapping was not conducted due to the presence of fire ants. Troglobitic species detected: *Cicurina bandida* *Cambala speobia speobia* *Speodesmus* sp. *Texoreddellia* sp.
Flint Ridge Cave	FRC is one of the most notable caves in the Austin area with over a thousand feet of passage descending to a total depth of over 150 feet beneath the SH 45 right of way.	This cave was not surveyed in association with this investigation. The following species are recorded as occurring in FRC: *Rhadine austinica* *Cicurina bandida* *Cambala speobia speobia* *Speodesmus* sp. *Texoreddellia* sp. *Texella mulaiki*

ENDANGERED KARST INVERTEBRATES IN THE PROJECT AREA

Of the seven endangered taxa known to occur in Travis and Williamson Counties, only the Bone Cave Harvestman (*T. reyesi*) has a location record within the project area. The Bone Cave harvestman is an obligate cave-dwelling harvestman restricted to Travis and Williamson counties (Ubick and Briggs 1992, 2004). Ubick and Briggs (1992) originally described the species when it was separated from Bee Creek Cave harvestman (*T. reddelli*). At maturity, Bone Cave harvestman is a pale orange harvestman with a total body length ranging from 0.06 to 0.11 inch (1.41 to 2.67 millimeters). Retinas are absent and corneal development varies from well-developed to absent (Ubick and Briggs 1992). Bone Cave harvestman likely feed on microarthropods, such as springtails (*Collembola spp.*). Ubick and Briggs (1992) also state that most specimens of Bone Cave harvestman have been observed in the deep cave environment, past the twilight zone. Bone Cave harvestman has a wider distribution than other *Texella* species. At the time of listing, *T. reddelli* was known to occur in five or six caves (Tooth Cave, Bee Creek Cave, McDonald Cave, Weldon Cave, Bone Cave, and possibly Root Cave; of these, all but Bee Creek Cave were later confirmed to contain *T. reyesi*) with a range that included approximately 75 square miles (21–31 linear miles). By the release of the 1994 Recovery Plan, the USFWS recognized 60 caves with confirmed occupancy by *T. reyesi*, and nine additional caves believed to be occupied by *T. reyesi* pending taxonomic confirmation. These caves represented a range of 135 square miles, an increase of 60 square miles. By 2009 when the Five-Year Review was completed, the USFWS recognized 168 known localities for *T. reyesi* with an approximate range of 190 square miles.

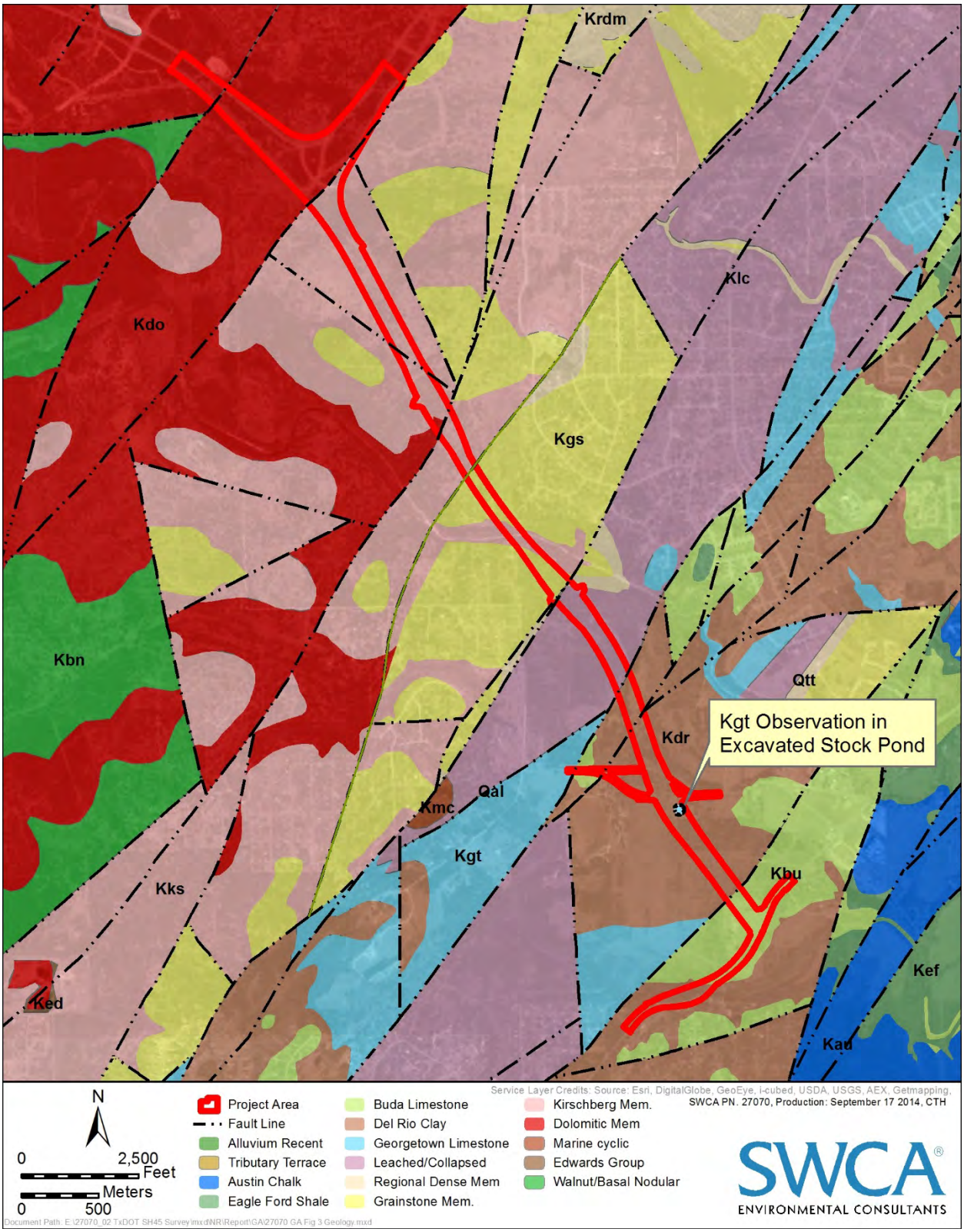


Figure 3. Geologic map of the project area.

All but one cave with a tentative *T. reyesi* record occur more than 16 miles north of the project area. One cave, Barker Ranch Cave No. 1, has been identified by the USFWS as being occupied by *T. reyesi* based on a record in Ubick and Brigs (2004). However, this record was only tentative due to the immature state of the specimen and it is now confirmed to have been in error. Figure 4 includes the original tentative record from Barker Ranch Cave No. 1 with notes as to treatment of immature specimens. Figures 5 and 6 present the *T. reyesi* distribution maps from the USFWS 5-Year review and Ubick and Briggs (2004). Confusion seems to have stemmed from the fact that Ubick and Briggs did not have the correct location for Barker Ranch Cave No. 1. If they had the correct cave location, the specimen from Barker Ranch Cave No. 1 would have been tentatively assigned to *T. mulaiki*, not *T. reyesi* due to other collection records for *T mulaiki* from nearby caves including Flint Ridge Cave. Figure 7 presents the ranges of *T. reyesi* and *T. mulaiki* as presented in Reddell and Paquin (in prep). The project area clearly falls within the known range of *T. mulaiki,* not *T. reyesi*.

In order to confirm the hypothesis that the original record was in error, Barker Ranch Cave No. 1 was re-surveyed as part of this investigation and the original specimen was re-located and re-analysed. On 22 July 2014 personnel from Cambrian Environmental, SWCA Environmental Consultants and the City of Austin entered Barker Ranch cave and were able to locate a single specimen (Photos 6 and 7). Both the new specimen and the original specimen were sent to the standing expert on the species, Darrell Ubick of the California Academy of Sciences. He has concluded that the original *T. reyesi* assignment was in error and that both the new and old specimens likely belong to *T. mulaiki* (Ubick 2014, Attachment B). No troglobitic harvestmen of any kind have been located during biological survey of caves within the project right of way. Based on these results we conclude that neither *T. reyesi*, nor any other listed karst invertebrate occurs in the project area.

Texella reyesi Ubick and Briggs
Maps 2, 4, 5.

Texella mulaiki, Goodnight and Goodnight, 1967:6 (in part)
Texella reddelli, Goodnight and Goodnight, 1967:7 (in part).
Texella reyesi Ubick and Briggs, 1992:211.

Notes.–As no other troglobitic species of *Texella* is known to occur in this distribution, records of females and juveniles are here included, albeit tentatively. According to J. Reddell (pers. com.) the following caves of this species have recently been destroyed: Puzzle Pit and Twisted Elm Cave (Travis County) and Black Cat Cave and Cassidy Cave (Williamson County).

New records.–UNITED STATES: Texas: **Travis Co**.: Barker Ranch Cave No. 1, 12 July 2000 (J. Krejca, V. Loftin, W. Russell, TMM), 1 juvenile; Cave, site # 401, near FM620, approx. 1-2 mi. S of Williamson Co. line, 1999 (P. Sunby, TMM), 1 male; Cold Cave, May 1994 (M. Warton, TMM), 1 male; Cotterell Cave, 19 February 1993 (J. Reddell, M. Reyes, TMM), 1 male; Featherman's Cave, 25 June 1998 (M. Sanders, TMM),

Figure 4. Tentative Barker Ranch Cave No. 1 record from Ubick and Briggs (2004).

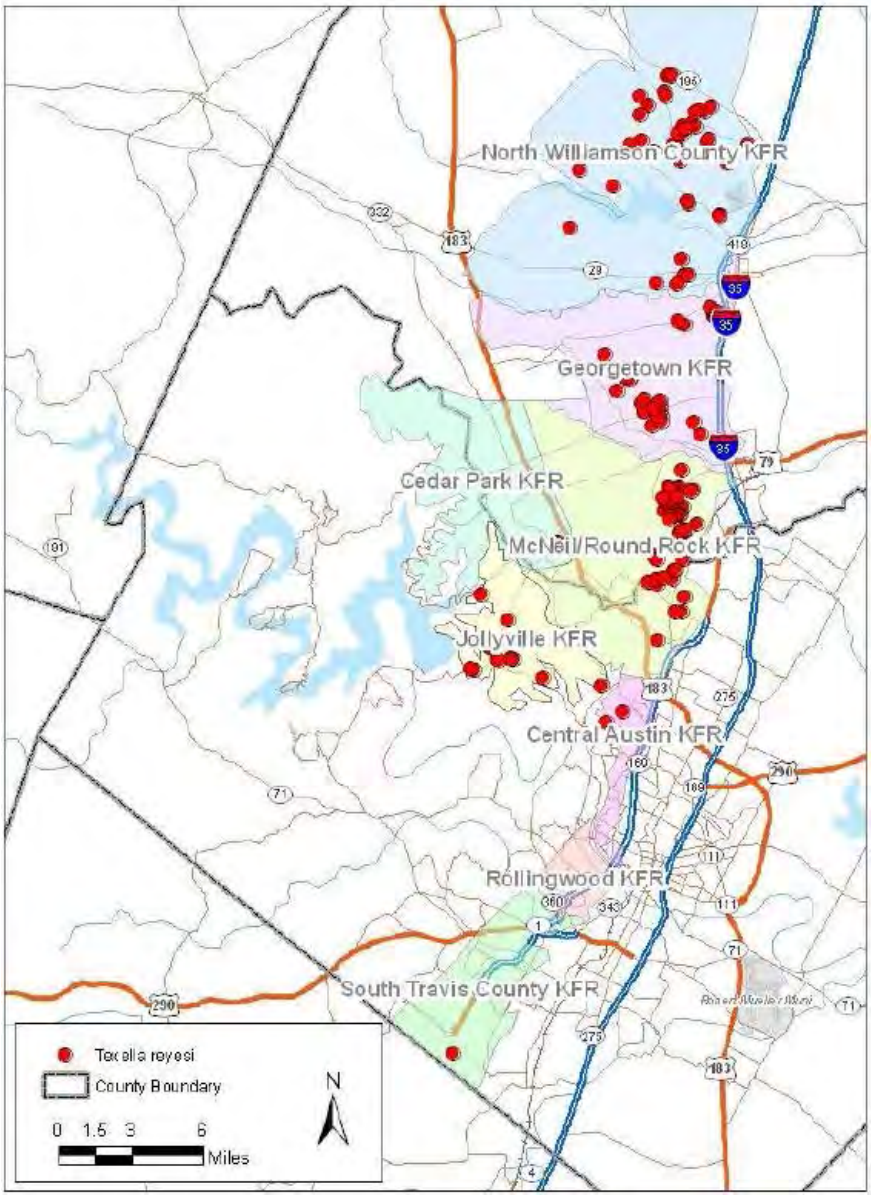
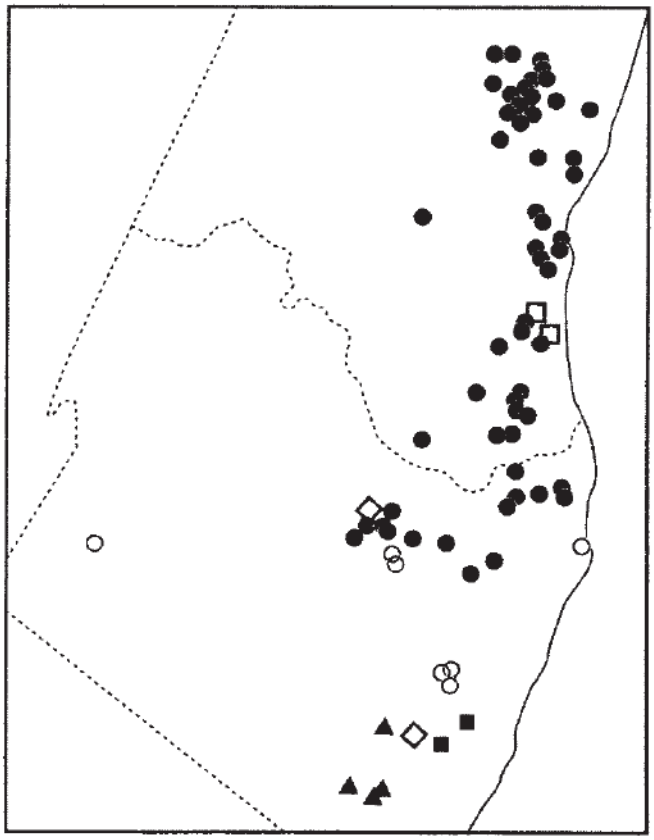


Figure 5. Distribution of *T. reyesi* locations from the USFWS 5-year review. The southern-most location is the tentative record for Barker Ranch Cave #1 which is located approximately 500 feet west of the project right of way.



Map 2. Western Williamson and Travis counties showing collection localities of *Texella* species: *mulaiki* infragroup, *T. mulaiki* Goodnight and Goodnight (triangles); *reddelli* infragroup, *T. reddelli* Goodnight and Goodnight (open circles), *T. reyesi* Ubick and Briggs (closed circles); *brevidenta* infragroup, *T. grubbsi* Ubick and Briggs (diamonds); and *spinoperca* infragroup, *T. spinoperca* Ubick and Briggs (closed squares), *T. fendi* Ubick and Briggs (open squares). The solid wavy line near the right margin represents highway 35.

Figure 6. Distribution map of troglobitic *Texella* spp. In Travis and Williamson counties as presented in Ubick and Briggs (2004). Note that no closed circles representing *T. reyesi* location occur in southern Travis County near the project area. They had tentatively included the Barker Ranch specimen with *T. reyesi* assuming that Barker Ranch cave clustered geographically with other sites for *T. reyesi*. Barker Ranch Cave #1 instead clusters geographically with confirmed locations for *T. mulaiki*.

Photograph 6. Entrance of Barker Ranch Cave #1.

Photograph 7. *Texella* spp. specimen collected from Barker Ranch Cave #1. Although immature this specimen differed from the morphology of *T reyesi* and matched the morphology of *T. mulaiki* in three diagnostic areas.

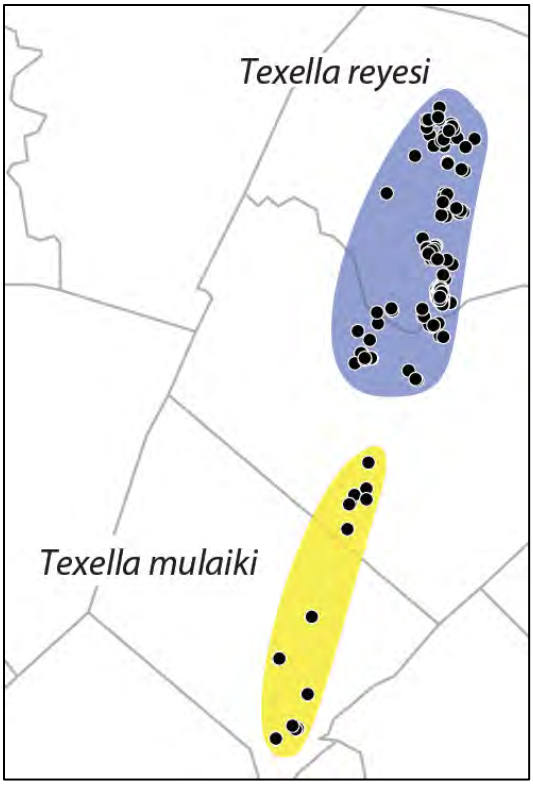


Figure 7. Distribution of *T. reyesi* and *T. mulaiki* as presented in Reddell (in prep). Note that the northern cluster of location for *T. mulaiki* includes the project area and Flint Ridge Cave.

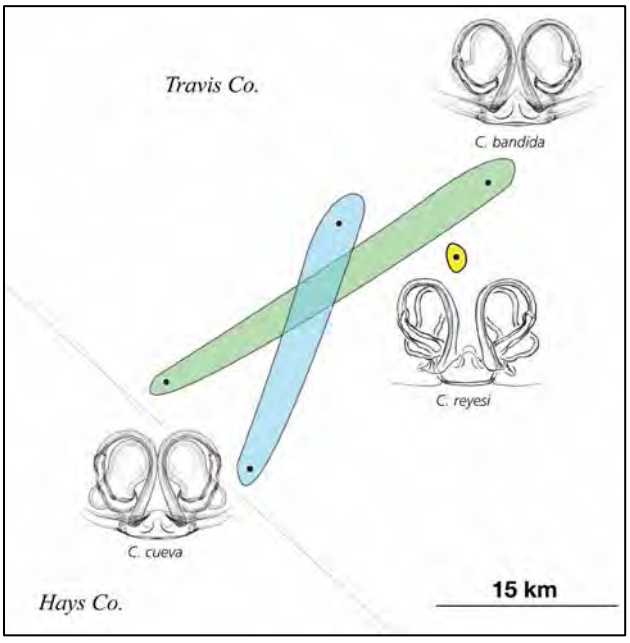


Figure 8. Distribution of troglobitic *Cicurina* spp. in southern Travis County as presented in Paquin and Duperre (2009). These three species are expected to be formally synonymized under *C. bandida* when the next taxonomic revision is published. *Cicurina* specimens collected from the project site are assumed to belong to *C. bandida*.

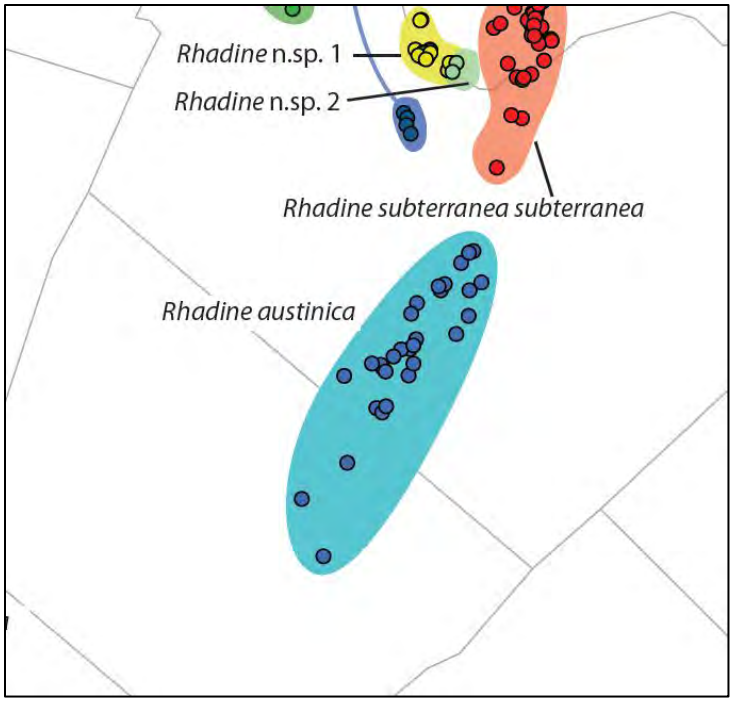
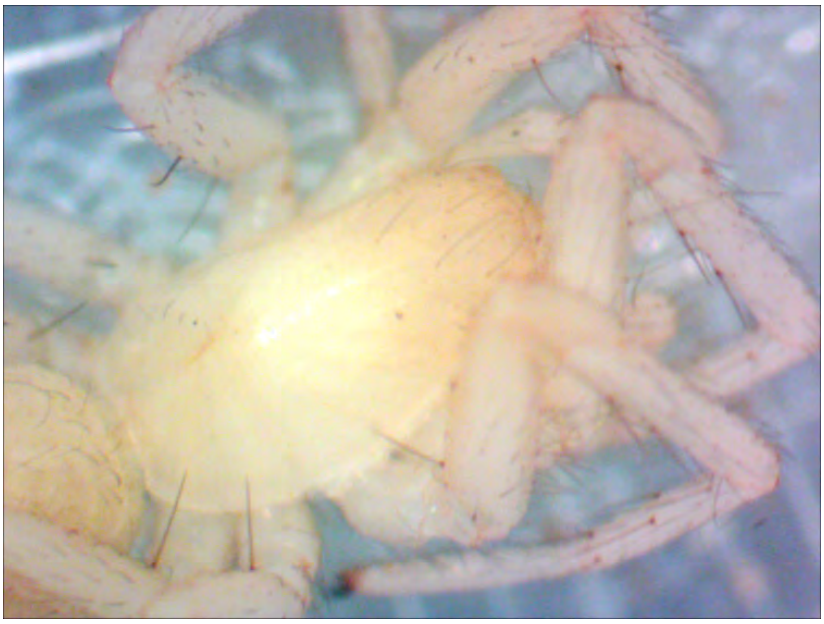


Figure 9. Distribution of troglobitic *Cicurina* spp. in southern Travis and northern Hays counties as presented in Reddell (in prep). The project occurs entirely within the known range of *R. austinica*.



Photograph 8. *Cicurina* spp., likely *C. bandida* collected from feature F-65.

Photograph 9. Interior of F-65.

Photograph 10. *Rhadine austinica* specimen collected on a bait trap in F-65.

IMPACTS ANALYSIS

This section summarizes the potential for adverse effects on karst invertebrate fauna from the construction and operation of SH 45 SW in southern Travis County. For a more detailed analysis of potential effects on Flint Ridge Cave see the separate report on the topic.[2] Troglobitic fauna are vulnerable to impacts from development activities due to their absolute dependence on environmental conditions present only in the caves. The USFWS most recently detailed the habitat requirements for endangered karst invertebrates in central Texas in the habitat module of the Bexar County Karst Invertebrate Recovery Plan[3] (Updated 28 July 2011). The USFWS identifies eight primary components of karst invertebrate habitat including:

1. Cave and Karst Habitat
2. Mesocaverns
3. Microhabitat (within the cave itself)
4. Drainage Basins (surface and subsurface)
5. Humidity and Temperature
6. Nutrients
7. Surface Vegetation Community
8. Surface Animal Community

[2] Cambrian Environmental and SWCA. 2014. Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas.

[3] http://www.fws.gov/southwest/es/Documents/R2ES/Bexar_RP_Habitat_module.pdf.

Most threats described below alter the stable physical environment of the cave, alter nutrient input, or introduce substances and/or organisms that have the potential to adversely affect karst invertebrate species.

- Entrances to caves can be filled in or collapse during development activities or activities for agricultural purposes. Covering cave entrances can alter the physical cave environment, as well as impede or eliminate nutrient input.

- Chemical contamination from ground water and/or surface drainages, including pesticides, fertilizers, sewage, hazardous materials spills, various pipeline leaks, storage tanker leaks, landfills, and urban run-off, could adversely affect karst invertebrates. Trash dumping also may be a source of chemical contamination.

- Altering surface drainage via alterations in topography, impervious cover, etc. could lead to drying of karst features and changes in nutrient inputs.

- Loss or alteration of surface communities can potentially adversely affect karst invertebrates by altering nutrient inputs, altering the stable physical environment of the cave, and introducing potentially harmful organisms. When changes in surface community plant composition occur, there is the potential to alter the type and quality of nutrient input into the cave system from the alteration of vegetation. Moreover, changes in surface plant species composition can in turn alter the surface animal species composition. Alterations in animal species composition may lead to less nutrient input into caves via a decrease of troglophiles and trogloxenes. Troglophiles are species that are not cave-adapted but have affinities for caves. Trogloxenes are species that may or may not be cave adapted but regularly use caves for sheltering and forage on the surface contributing organic matter to the cave ecosystem. If the surface plant community is denuded (replaced with impervious cover, left as bare ground, etc.) this could lead to fluctuations in cave temperatures and moisture regimes that are outside the normal range of variability for the system. Lastly, disturbance of the soil may lead to increased density of red imported fire ants (*Solenopsis invicta*) and alter the physical environment of the cave through increased sedimentation.

- Materials excavation operations have the potential to alter the stable physical environment of the cave ecosystem by increasing the number of cave entrances, which could have a drying effect, increase sedimentation, and change water drainage patterns to the system. Furthermore, caves can be completely destroyed through this type of activity.

Karst impacts avoidance and minimization measures for the proposed project began during the design phase where karst features known to contain suitable habitat for karst fauna were avoided by the roadway layout to the extent practicable. Impacts to the first three habitat components (Cave and Karst Habitat, Mesocaverns and Microhabitat) have been minimized by avoiding the physical cave structures themselves. None of the features known to be associated with habitat for karst fauna will be physically disturbed by roadway construction of operation.

Impacts to the next two habitat components (Drainage Basins and Humidity and Temperature) have been minimized by avoiding and/or maintaining the majority of the surface drainage areas for each feature to the extent practicable. The subsurface drainage basins of the features are unknown, but it is likely that the roadway would occur within the subsurface drainage basins of some of the habitat features. Because the proposed roadway would likely be within the subsurface drainage basin does not mean that there will be impacts to the subsurface hydrology of the cave, however. The roadway itself is impervious cover and all storm water would be channeled away from the habitat features through conveyances with impermeable liners. Appropriate BMPs will be implemented in this vicinity during construction and operation of the

project according to the Water Pollution Abatement Plan. As detailed in the Biological Evaluation and other technical reports associated with the Environmental Impact Statement, the proposed project will incorporate state-of-the-art water quality Best Management Practices (BMPs) intended to avoid and minimize impacts to water quality and the Edwards aquifer. The proposed use of BMPs in series will result in water quality protections attaining a much higher standard than typically required under the Texas Commission on Environmental Quality Edwards Aquifer Protection Program. The performance standard for structural and non-structural stormwater treatment would generally be more than 90% removal of Total Suspended Solids.

In addition to these BMPs, the majority of the site itself contains soils that have natural buffering capabilities. The portion of the project area near FRC is located within a mapped deposit of terra rossa, a clay paleosol formed by in-situ weathering of limestone. Within this area the typical characteristics of the recharge zone do not occur. Whereas outcrops of the Edwards group typically exhibit thin to absent soils, abundant rock outcrops and scrubby live/oak-juniper vegetation, the terra rossa terrains have relatively deep heavy clay soils, few rock outcrops, and vegetation including mesquite trees which are typically found on the Del Rio Clay but are rare within the recharge zone. Based on site characteristics and the above conservation measures it is unlikely that significant impacts to subsurface drainage basins would occur.

Impacts to the last three habitat components (Nutrients, and Surface Vegetation and Animal Communities) were also avoided and minimized to the extent practicable by maintaining a natural buffer within the right of way to the maximum extent practicable. The metric commonly used by the USFWS to determine the potential for these impacts is protection of the likely trogloxene foraging area. Based on studies of common trogloxene species such as *Ceuthophilus* spp. cave crickets (Taylor et al, 2005), the USFWS had determined this area to extend up to 105 meters or 345 feet from the cave entrance. Although the roadway will encroach on the cricket foraging area for some features further encroachment of this area in the future is unlikely due to the fact that the majority of the surrounding land will be maintained as water quality protection land. Natural buffer areas will be maintained and managed within the right of way.

Table 3 provides a summary of the potential impacts to features with karst fauna habitat based on the proposed roadway schematics and avoidance and minimization measures.

Table 3. Summary of potential impacts to features containing karst fauna.

Feature	Distance from Entrance to Proposed Edge of Pavement	Surface Drainage Area Impacts?	Cricket Forage Impacts	Conservation Measures	Endangered Karst Invertebrates Present?
F-18 Cow Pattie Cave	~475 feet	No	No	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures Per WPAP	No
F23 Hat Sink	~55 feet	Slight Reduction	Partial Encroachment	Surface Catchment Largely Maintained with Bottomless Culvert Enhanced Water Quality Measures Per WPAP	No

Feature	Distance from Entrance to Proposed Edge of Pavement	Surface Drainage Area Impacts?	Cricket Forage Impacts	Conservation Measures	Endangered Karst Invertebrates Present?
F-64/65	~30 feet to elevated roadway section	No	Partial Encroachment	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures Per WPAP	No
F-110 Jubilee Cave	~30 feet to elevated roadway section	No	Partial Encroachment	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures Per WPAP	No
F-157a SH 45 Cave	~80 feet (Currently ~40 feet)	No, potentially improved	Partial Encroachment	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures	No
Flint Ridge Cave	~375 feet	Slight modification, but no net loss	No	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures	No
Barker Ranch Cave #1	500+ feet	No	No	Surface Catchment Avoided by Roadway Enhanced Water Quality Measures	No

CONCLUSION

Biological investigation of karst features within and adjacent to the right of way of the proposed project indicate that no endangered karst invertebrates occur in the project area. Rare karst invertebrate species of concern were previously known from the project area (most proximally within Flint Ridge Cave and Barker Ranch Cave #1). Biological investigations have identified five additional locations for karst fauna within the right of way including three locations for BCCP SOC. Construction of the proposed project is not likely to impact the BCCP SOC found within FRC or Barker Ranch Cave #1. Some encroachment of drainage area and cricket foraging area for features containing non-listed species would occur.

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ATTACHMENTS

TABLE 11

CAVES (CONTAINING LISTED AND NON-LISTED KARST INVERTEBRATES) PROPOSED FOR PROTECTION

Adobe Springs Cave
Airman's Cave
Amber Cave
Armadillo Ranch Sink
Arrow Cave
Bandit Cave
Beard Ranch Cave
Bee Creek Cave
Blowing Sink
Broken Arrow Cave
Buda Boulder Spring
Cave X
Cave Y
Ceiling Slot Cave
Cold Cave
Cotterell Cave
Disbelievers Cave
District Park Cave
Eluvial Cave
Flint Ridge Cave
Fossil Cave
Fossil Garden Cave
Gallifer Cave
Get Down Cave
Goat Cave
Hole-in-the-Road Cave
Ireland's Cave
Jack's Joint
Japygid Cave
Jest John Cave
Jester Estates Cave
Jollyville Plateau Cave
Kretschmarr Cave
Kretschmarr Double Pit
Lamm Cave
Little Bee Creek Cave
Lost Gold Cave
Lost Oasis Cave
M.W.A. Cave
Maple Run Cave
McDonald Cave
McNeil Bat Cave
Midnight Cave
Moss Pit
New Comanchee Trail
No Rent Cave
North Root Cave
Pennie Cave
Pickle Pit
Pipeline Cave
Rolling Rock Cave
Root Cave
Slaughter Creek Cave
Spanish Wells Cave
Spider Cave
Stark's North Mine
Stovepipe Cave
Talus Spring
Tardus Hole
Tooth Cave
Weldon Cave
Whirlpool Cave

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23 October 2014

Re: The identification of *Texella* from Barker Ranch Cave No. 1, Travis Co., Texas

Dear Ms Westerman,

In our study of *Texella* (Ubick and Briggs 2002), the specimen from Barker Ranch Cave No. 1 was tentatively assigned to *T. reyesi*. Since this specimen was a juvenile, the identification was based only on its somatic features, namely the strongly cave-adapted (troglomorphic) body form. However, another species in the region, *T. mulaiki*, is similarly cave-adapted. Although adults of the two species can be unambiguously separated, the juveniles are more difficult to determine. The most apparent difference lies in the number of spines on the inner face of the palpal tibia: three in *T. reyesi*, two in *T. mulaiki*. This difference is obvious in adults, but the apical spine may be quite reduced in juvenile *T. reyesi*.

A second specimen of *Texella* from Barker Ranch Cave No. 1, also juvenile, was recently collected (22 July 2014). I have now closely examined this specimen and the earlier one (TMM IZC 45 550). Both were compared with juveniles, of *T. reyesi* and *T. mulaiki,* which were associated with adult specimens to insure conspecificity, from Travis County caves.

It turns out that both specimens from Barker Ranch Cave No. 1 lack the third tibial spine, but have instead a seta which we misinterpreted in our study. Two additional differences were also noted. The two specimens are more troglomorphic, having relatively longer legs and a more reduced eyemound, than are *T. reyesi* in this region (although northern populations of *T. reyesi* are also highly troglomorphic). On the basis of these three characters, it is safe to conclude that the specimens from Barker Ranch Cave No. 1 are not *T. reyesi*, but are probably *T. mulaiki*.

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Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas

Prepared for

Texas Department of Transportation

Prepared by

Cambrian Environmental

and

SWCA Environmental Consultants

SWCA Project No. 27070.02

November 2014

Potential Effects of the Construction and Operation of State Highway 45 Southwest on the Ecological Integrity of Flint Ridge Cave in Southern Travis County, Texas

CSJs 1200-06-004 and 1200-07-001

Prepared for

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As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

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BACKGROUND

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority are currently in the planning stages of the proposed State Highway 45 Southwest (SH 45 SW) transportation project. The project would extend a current segment of SH 45 from the southern terminus of State Loop 1 (MoPac) to Farm-to-Market Road 1626 (FM 1626) through Travis and Hays Counties. The length of this extension is about 3.5 miles—all but the southern tip of which occurs within the recharge zone for the Barton Springs Segment of the Edwards Aquifer. The proposed project consists of construction of a four-lane roadway within state-owned right of way (ROW) that is generally 425 to 575 feet wide and totaling approximately 309 acres. The proposed project occurs within the Balcones Escarpment, a highly cavernous geographic region known to be occupied by a diverse community of rare and endangered karst invertebrates. Karst invertebrates are obligate cave-dwelling (troglobitic) organisms characterized by a number of anatomical and physiologic adaptations to cave life including loss of pigment and sclerotization (thickness of the exoskeleton), reduction or loss of eyes, elongation of appendages, lengthened life span, modified fecundity, and metabolic adaptation to nutrient-poor habitat conditions. The cave environment is relatively monotonous compared to surface invertebrate habitats and is characterized by stable temperatures close to the mean surface temperature, constant near-saturation humidity, low evaporation rates, and the absence of photosynthetic nutrient production.

Six karst invertebrate species from Travis County have been listed as endangered by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA). In an attempt to balance development impacts with conservation, Regional Habitat Conservation Plans (RHCPs) have been developed in both Travis and Williamson counties. These plans, coordinated between local governments and the USFWS, have successfully protected dozens of known locations not only for the endangered taxa but for many of the other rare cave-adapted species who share the same habitat and who might otherwise become candidates for endangered status. In Travis County the Balcones Canyonlands Conservation Plan (BCCP) has implemented a habitat conservation plan which aims to provide protection for 62 specific caves known at the time the permit was drafted to contain both endangered karst invertebrates and a broader category of karst invertebrate species of concern (SOC). Protection of SOC caves provides "no surprises" protections for the BCCP permit holders under the ESA whereby no further resources will be required of the permit holders in the future should any of those SOC become listed. None of the BCCP SOC are currently proposed for listing.

Flint Ridge Cave (FRC) is one of the most notable caves in the Austin area both for its ecological and hydrological significance. Figure 1 presents the cave map for FRC. It is one of the 62 caves identified in the BCCP due to the presence of two SOC including a beetle (*Rhadine austinica*) and a spider (*Cicurina bandida*). See Figure 2 for the full list of BCCP caves. The entrance of FRC is located approximately 150 feet east of the ROW for SH 45SW on land owned and managed by the City of Austin for management of the Edwards Aquifer. The entrance of FRC is marked by a large sinkhole and, relative to most caves known from the Edwards Aquifer recharge zone, the cave has an anomalously large surface catchment area. It is known as one of the most significant upland recharge features in the Barton Springs zone.

IMPACTS ANALYSIS

This document summarizes the potential for adverse effects on the ecological integrity of Flint Ridge Cave (FRC) from the construction and operation of SH 45 SW in southern Travis County. Troglobitic fauna are vulnerable to impacts from development activities due to their absolute dependence on environmental conditions present only in the caves. The USFWS most recently detailed the habitat requirements for endangered karst invertebrates in central Texas in the habitat module of the Bexar County Karst Invertebrate Recovery Plan[1] (Updated 28 July 2011). The USFWS identifies eight primary components of karst invertebrate habitat including:

1. Cave and Karst Habitat
2. Mesocaverns
3. Microhabitat
4. Drainage Basins
5. Humidity and Temperature
6. Nutrients
7. Surface Vegetation Community
8. Surface Animal Community

Most threats described below alter the stable physical environment of the cave, alter nutrient input, or introduce substances and/or organisms that have the potential to adversely affect karst invertebrate species.

- Entrances to caves can be filled in or collapse during development activities or activities for agricultural purposes. Covering cave entrances can alter the physical cave environment, as well as impede or eliminate nutrient input.

- Chemical contamination from ground water and/or surface drainages, including pesticides, fertilizers, sewage, hazardous materials spills, various pipeline leaks, storage tanker leaks, landfills, and urban runoff, could adversely affect karst invertebrates. Trash dumping also may be a source of chemical contamination.

- Altering surface drainage via alterations in topography, impervious cover, etc. could lead to drying of karst features and changes in nutrient inputs.

- Loss or alteration of surface communities can potentially adversely affect karst invertebrates by altering nutrient inputs, altering the stable physical environment of the cave, and introducing potentially harmful organisms. When changes in surface community plant composition occur, there is the potential to alter the type and quality of nutrient input into the cave system from the alteration of vegetation. Moreover, changes in surface plant species composition can in turn alter the surface animal species composition. Alterations in animal species composition may lead to

[1] http://www.fws.gov/southwest/es/Documents/R2ES/Bexar_RP_Habitat_module.pdf

less nutrient input into caves via a decrease of troglophiles and trogloxenes. Troglophiles are species that are not cave-adapted but have affinities for caves. Trogloxenes are species that may or may not be cave adapted but regularly use caves for sheltering and forage on the surface contributing organic matter to the cave ecosystem. If the surface plant community is denuded (replaced with impervious cover, left as bare ground, etc.) this could lead to fluctuations in cave temperatures and moisture regimes that are outside the normal range of variability for the system. Lastly, disturbance of the soil may lead to increased density of red imported fire ants (*Solenopsis invicta*) and alter the physical environment of the cave through increased sedimentation.

- Materials excavation operations have the potential to alter the stable physical environment of the cave ecosystem by increasing the number of cave entrances, which could have a drying effect, increase sedimentation, and change water drainage patterns to the system. Furthermore, caves can be completely destroyed through this type of activity.

The BCCP HCP[2] states that in order for the permit holders to get "no surprises" assurances under the ESA, the specifically named SOC caves must be protected as follows:

> To be considered "protected" a karst fauna area must contain a large enough expanse of continuous karst and surface area to maintain the integrity of the karst ecosystem on which each species depends. The size and configuration of each karst fauna area must be adequate to maintain moist, humid conditions, air flow, and stable temperatures in the air-filled voids; maintain an adequate nutrient supply; prevent contamination of the surface and groundwater entering the ecosystem; prevent or control the invasion of exotic species, such as fire ants; and allow for movement of the karst fauna and nutrients through the interstitium between karst features. In most instances, this will entail protecting the entire surface and sub-surface drainage area of each cave and enough of the surface vegetation community to support small animals and buffer against fire ant infestations that can eliminate native ant populations. In absence of detailed hydrological studies for use in delineating cave preserve boundaries, land delineated by the contour interval representing the bottom of the cave should be targeted for preservation. (BCCP EA/HCP p. 2-30)

The following discussion will consider the potential for impacts to the ecological integrity of FRC according to each of the USFWS's habitat components.

1. **Cave and Karst Habitat** The cave and karst habitat components refers to the physical architecture of the humanly accessible subsurface habitat. Current schematics for the SH 45 SW project do not include any activities above the footprint of the cave (See attached schematics). The majority of the cave footprint occurs outside of the ROW with the exception of the terminal passage. In plan view, the footprint extends within approximately 60 feet of the proposed edge of pavement of the roadway. However, that portion of the cave occurs at depths up to 150 feet below the land surface. Accordingly, the cave and karst habitat component is unlikely to be affected by the project.

2. **Mesocaverns** This habitat component consists of the humanly inaccessible void spaces which provide important sheltering habitat for invertebrates and avenues for dispersal between caves. These voids extend for unknown distances from the cave footprint and may be integrated with the subsurface hydrology of the cave system. Because the project will not impact the cave footprint

[2] http://www.co.travis.tx.us/tnr/bccp/pdfs/Habitat_Conservation_Plan_Final_Environment_Impact_Statement.pdf

and because the distance between the construction area and the footprint is generally several hundred feet (with the exception of the terminal passage) the mesocavern habitat component is unlikely to be affected by the project. In the vicinity of FRC the proposed roadway will be elevated and built on fill. Excavation activities will be limited to the minimal amount of grading required to install retaining walls and to create a compensating drainage area as necessary to replace drainage area being covered by the roadway. See page 4 of the attached EIS Drainage sheets and additional comments in drainage basin section below.

3. **Microhabitat** This habitat component consists of preferable breeding, feeding and sheltering sites within the cave itself. Because the project will not impact the cave footprint the microhabitat habitat component is unlikely to be affected by the project.

4. **Drainage Basins** FRC is one of the most notable caves in the Austin area both for its ecological and hydrological significance. The entrance of FRC is located approximately 150 feet east of the ROW for SH 45SW on land owned and managed by the City of Austin for management of the Edwards Aquifer. The entrance of FRC is marked by a large sinkhole and relative to most caves known from the Edwards Aquifer recharge zone the cave has an anomalously large surface catchment area. It is known as one of the most significant upland recharge features in the Barton Springs zone. Previous estimates of the drainage basins' size have ranged between 40 and 69 acres. The larger of these estimates, however, was based on topography data of lesser accuracy than what it currently available. Recent karst investigations (including the Draft Environmental Impact Statement for the project) have generated more accurate topographic models of the FRC surface drainage basin as 55.5 acres based on LIDAR and aerial survey data. The drainage basin boundaries were also ground-truthed with on-site observations of flow patterns following heavy rains in late September 2014. The most important difference between the earlier and more recent drainage basin estimates is that it has now been demonstrated that the FRC drainage basin does not entirely cross the SH 45 ROW. Further, the most recent schematics show that the roadway can be constructed almost entirely outside of the FRC surface drainage basin. Current schematics for the roadway indicate that approximately 0.71 acres of the drainage basin will be covered by the roadway. Runoff from that area will be routed outside of the drainage basin and treated through a series of structural and non-structural Best Management Practices (BMPs). To compensate for the loss of drainage area an area of equivalent acreage east of the roadway and along the FRC drainage basin boundary will be graded upward so that it contributes runoff to the FRC drainage basin. The area will be constructed with clean soil taken from the site and it will be re-vegetated with native vegetation. The project will be completed with no net loss of surface drainage basin for FRC. The attached drainage schematic for the vicinity of FRC illustrates surface flow patterns affecting FRC and nearby features and identifies the area to be re-graded to contribute to the FRC surface drainage basin.

   In concept, the subsurface drainage basin is the area within which groundwater may flow into a cave or associated mesocavern habitat. Delineation of a subsurface drainage basin is complicated for a variety of reasons. First, the concept is inherently problematic when the cave in question occurs within a contiguous karst landscape containing multiple caves. Where does one drainage basin end and another begin? Fundamental aspects of karst invertebrate habitat remain unknown. To what extent does habitat extend beyond the limits of the cave map? Caves containing stable habitat for terrestrial species are generally perched above the modern water table where total inundation no longer occurs. These caves were generally formed at or near ancient water tables under paleohydrologic conditions, and their morphology reflects that origin. Modern hydrology, however, tends to be dominated by vertical infiltration of small amounts of water along fractures. Does the shape of the cave (as represented by the cave map) have anything to do with the direction from which modern drainage may originate? Because of these and many other

uncertainties, in practice, most previous delineations of subsurface drainage basins for caves containing endangered karst invertebrates in Texas have relied on the professional opinions of karst consultants using buffers of various distances based on metrics derived from cave footprints or other sources. Few of their methods have involved actually tracing moisture through the vadose (above the water table) zone above the caves.

Due to the complexity of the underlying geology, the subsurface drainage basin for FRC is difficult to delineate. In 2000, Veni did a hydrogeologic assessment of FRC and defined the subsurface drainage area. Veni went on to state that these boundaries delineate the minimum areas through which recharge is likely to enter FRC and that recharge from beyond these areas may also reach the cave. Due to the proximity of the cave footprint to the proposed roadway alignment, the majority of methods used by previous researchers would put the roadway within the caves subsurface drainage basin. The City of Austin is commencing a study which will attempt to identify the specific surface locations of water entering FRC through various known drip locations in the cave ceiling. The completion date of that study is unknown. Data collection will be subject to the occurrence of large rain events and the study results may not be conclusive. The results of the study may indicate discrete points of surface connection but the scope of the study is not extensive enough to define the subsurface drainage area of FRC.

Because the proposed roadway would likely be within the subsurface drainage basin does not mean that there will be impacts to the subsurface hydrology of FRC, however. The roadway itself is impervious cover and all storm water will be channeled away through impermeable conveyances. All known sensitive recharge features within the right of way in the vicinity of FRC will be protected in accordance with TCEQ rules. At present only one such feature is considered sensitive. Feature F-55 is a fractured rock outcrop within a drainage channel whose drainage basin defines the western limit of the FRC surface drainage basin. In order to provide an enhanced buffer area for FRC, the roadway is currently proposed to cover F-55. However, the hydrologic function of F-55 will be maintained with the installation of a bottomless culvert which will allow unaltered runoff from its drainage basin to continue to flow across F-55. There will also be compensating drainage area directed to F-55. See page 7 of the EIS drainage detail sheets. Feature F-62a is considered a sensitive feature although it was not subjected to the exploratory excavation work that other potentially sensitive features were given because it is located just outside of the right of way. It will be included within the buffer area for FRC along with its surface drainage basin.

Based on the geologic structure that influenced the development of FRC the most likely area within the right of way to contribute to the subsurface drainage basin would be the fault plane along which the lower two-thirds of the cave is developed. This fault is identified as Fault 5 in the project geologic assessment. Appropriate BMPs will be implemented in this vicinity during construction and operation of the project according to the Water Pollution Abatement Plan. BMPs would be designed to mitigate impacts from storm water and accidental spills. The attached evaluation of spill data for the project area addresses the likelihood of spills.

In addition to these BMPs the majority of the site itself contains soils that have natural buffering capabilities. The portion of the project area near FRC is located within a mapped deposit of terra rossa, a clay paleosol formed by in-situ weathering of limestone. Within this area the typical characteristics of the recharge zone do not occur. Whereas outcrops of the Edwards group typically exhibit thin to absent soils, abundant rock outcrops and scrubby live/oak-juniper vegetation, the terra rossa terrains have relatively deep heavy clay soils, few rock outcrops, and vegetation including mesquite trees which are typically found on the Del Rio Clay but are rare within the recharge zone.

In 2005, TxDOT commissioned a detailed site-specific investigation of soil conditions in the project area.[3] Reports from those studies are attached. During the 2007 investigation professional soil scientists and hydrogeologists conducted field studies within the FRC drainage basin and the Headquarter Flat Sink Cave (HFSC) site just to the northeast of the project area at the Ladybird Johnson Wildflower Center. The findings of those studies can be summarized as follows:

- Soil diversity is greater than illustrated on existing Natural Resources Conservation Service soil maps;
- Soil properties serve as strong buffers to aquifer contamination;
- High clay contents serve as a significant buffer to aquifer recharge;
- Major pathways of water movement exist along roots and rocks in the upper portion of the soil column, but preferential flow is less than earlier anticipated using brilliant blue dye;
- Limited water flow occurs through the lower portion of the soil column and the subjacent limestone because of clay-plugged macrovoids and fissures;
- Due to increased impervious cover, enhanced surface runoff is likely to be a major construction impact;
- Overland flow of surface water is most critical when soils are very moist to saturated;
- A higher percentage of soils at HFSC are shallower than at FRC;
- Soil texture, clay content, and stone content at the two sites are similar;
- Soil infiltration rates (not the same as aquifer recharge) and soil storage of water are expected to be higher at FRC than HFSC because soil depths are greater at FRC; and
- It is expected that water runoff from soils at the HFSC site would be greater than at the FRC site.

It should be noted that due to FRC's unusually large drainage basin, water is not likely to be a limiting factor for the terrestrial karst invertebrate species of concern known from the cave. In fact, FRC is known to be completely inundated by storm water during flood events, a state that few other caves on the BCCP acquisition are ever subjected to. As a result it is likely that the troglobitic beetle and spider populations in FRC rely on upper-level mesocaverns as refugia during flood events. Those upper level refugia occur entirely within the portion of the cave that is outside of the project ROW.

Based on site characteristics and the above conservation measures it is unlikely that significant impacts to the FRC surface or subsurface drainage basins would occur.

5. **Humidity and Temperature** This habitat component refers to the capacity of the subsurface environment to maintain atmospheric conditions that are buffered from variations in surface conditions. Because the project will not impact the cave footprint and other items mentioned above the humidity and temperature habitat component is unlikely to be affected by the project.

6. **Nutrients** This habitat component refers to the cycling of organic matter within the cave system which relies upon input from the overlying surface ecology. The metric commonly used to determine the potential for these impacts is protection of the likely trogloxene foraging area. Based on studies of common trogloxene species such as cave crickets (*Ceuthophilus* spp.), the

[3] Wilding, L. 2005 Site Specific Soil Investigations for the Proposed State Highway 45 (South) Located in Travis and Hays Counties, Texas

USFWS had determined this area to extend up to 105 meters or 345 feet from the cave entrance. As can be seen in the attached drainage details the entire potential trogloxene foraging area will be avoided. Accordingly the nutrient habitat component is unlikely to be affected by the project.

7. **Surface Vegetative Community** This habitat component refers to the native grassland/woodland required to provide forage for trogloxene species. The USFWS has determined that the minimal area required to sustain a native grassland/woodland for a karst invertebrate preserve is between 40 and 100 acres. Surface vegetative community will not be a limiting factor for FRC following construction of the proposed project since FRC occurs on a very large section of the City of Austin Water Quality Protection Lands.

8. **Surface Animal Community** This habitat component refers to the fauna which provide carcasses, scat, and other forms of nutrient cycling for the trogloxene community. The surface animal community will not be a limiting factor for FRC following construction of the proposed project since FRC occurs on a very large section of the City of Austin Water Quality Protection Lands.

CONCLUSION

Based on site characteristics and proposed impacts avoidance and minimization measures the ecological integrity of Flint Ridge Cave is likely to be maintained. TxDOT along with its partners and consultants have extensive experience in constructing and operating roadways in sensitive karst areas. Recent projects such as US 183-A, SH 45 North, RM 1431, IH 35 over Inner Space Cavern, and the SH 195 improvement project have all been completed with similar, but less extensive karst due-diligence programs. Construction of the proposed project is not likely to impact the BCCP SOC found within FRC.

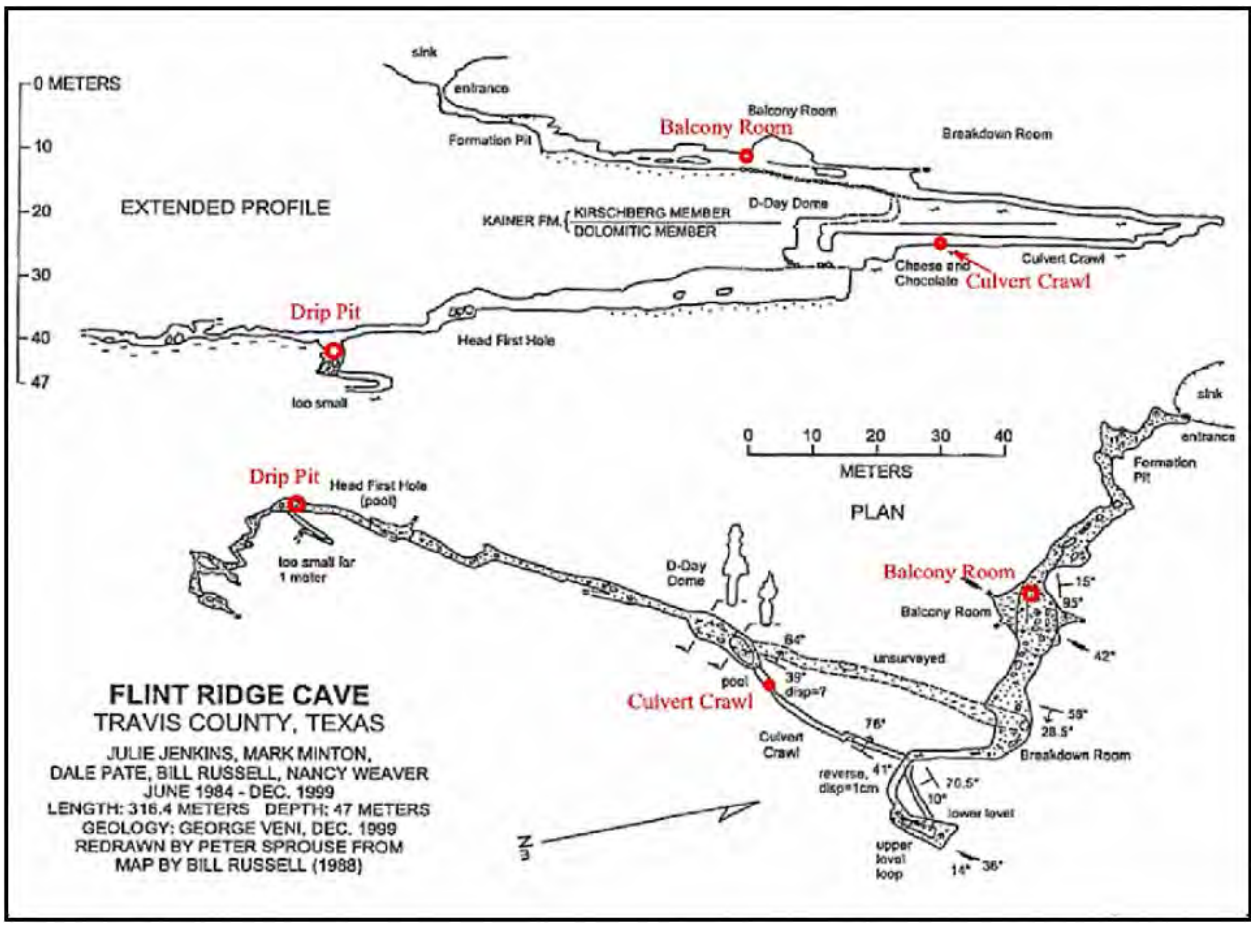


Figure 1. Map of Flint Ridge Cave.

TABLE 11

CAVES (CONTAINING LISTED AND NON-LISTED KARST INVERTEBRATES) PROPOSED FOR PROTECTION

Adobe Springs Cave	Fossil Garden Cave	Midnight Cave
Airman's Cave	Gallifer Cave	Moss Pit
Amber Cave	Get Down Cave	New Comanchee Trail
Armadillo Ranch Sink	Goat Cave	No Rent Cave
Arrow Cave	Hole-in-the-Road Cave	North Root Cave
Bandit Cave	Ireland's Cave	Pennie Cave
Beard Ranch Cave	Jack's Joint	Pickle Pit
Bee Creek Cave	Japygid Cave	Pipeline Cave
Blowing Sink	Jest John Cave	Rolling Rock Cave
Broken Arrow Cave	Jester Estates Cave	Root Cave
Buda Boulder Spring	Jollyville Plateau Cave	Slaughter Creek Cave
Cave X	Kretschmarr Cave	Spanish Wells Cave
Cave Y	Kretschmarr Double Pit	Spider Cave
Ceiling Slot Cave	Lamm Cave	Stark's North Mine
Cold Cave	Little Bee Creek Cave	Stovepipe Cave
Cotterell Cave	Lost Gold Cave	Talus Spring
Disbelievers Cave	Lost Oasis Cave	Tardus Hole
District Park Cave	M.W.A. Cave	Tooth Cave
Eluvial Cave	Maple Run Cave	Weldon Cave
Flint Ridge Cave	McDonald Cave	Whirlpool Cave
Fossil Cave	McNeil Bat Cave	

Figure 2. Excerpt from Balcones Canyonlands Conservation Plan.

MEMO

February 12, 2014
(Revised April 25, 2014)

To: Carlos Swonke, P.G.
Director of Environmental Affairs

Through: Rodney Concienne, P.G.
Branch Manager, ENV-HMM

From: David Morley, P.G.
Environmental Specialist, ENV-HMM

Subject: AUS SH45 SW (CSJ 1200-06-004) – Travis County Spill Data Evaluation

Summary

The Texas Department of Transportation (TxDOT) is in the advanced planning stages of the proposed 3.5-mile section of State Highway 45 Southwest (SH45 SW; CSJ 1200-06-004). When completed, the proposed project will connect MoPac South to FM1626 in Travis County. Previously proposed project development in this area generated concern among several groups regarding the potential impacts to the Edwards Aquifer. The City of Austin (COA) Watershed Protection Department completed a dye trace study in 2010 to simulate accidental spills in selected portions of the proposed SH45 SW project area. COA published the results of the dye trace study in a report dated October 2012, and they concluded that "an accidental spill from SH45 SW and MoPac South intersection area can be expected to recharge into the Edwards Aquifer and initially arrive at Barton Springs within two to four days under high aquifer discharge conditions. Slower initial arrival times of about three weeks can be expected under drought conditions, on the basis of previous studies…" In response to the community's sensitivity to potential future impacts to the Edwards Aquifer resulting from possible accidental spills from vehicles traveling along SH45 SW and a desire to plan for the implementation of appropriate measures during highway construction and operation to protect the aquifer, TxDOT compiled and analyzed roadway spill data from federal, state, county, and city databases for the time period of 2003 – 2012 to quantify the probability of an accidental spill of hazardous liquids from mobile sources (i.e., vehicles, tanker trucks, etc.) occurring within this proposed 3.5-mile section of highway. TxDOT calculated that a maximum of 5.6 hazardous liquids spills per billion vehicle miles traveled occurred on one of three existing parkways and highways in Travis County that are most similar to the proposed SH45 SW during 2003 – 2012. One spill occurred only on existing SH45 SE (IH35 to SH130) during its 3.7 operational history with approximately 0.18 billion vehicle miles traveled. No spills occurred on either of the other two analogous parkways or highways over a 10 year period with approximately 2.58 billion vehicle miles traveled.

1 Introduction

The Texas Department of Transportation (TxDOT) is in the advanced planning stages of the proposed 3.5-mile State Highway 45 Southwest (SH45 SW). When completed, the proposed project will connect MoPac South to FM1626. This is a new project that once was a part of the formerly proposed Austin Outer Loop project, which was proposed in the 1980s and consisted of five segments and the extension of MoPac South to intersect the southwest portion of SH45. Three of the segments were completed in the early 1990s, and MoPac South and a small west-to-east portion of SH45 joining MoPac South and FM 1826 were completed in 1995. The currently proposed SH45 SW project is situated on part of the recharge zone of the Barton Springs Segment of the Edwards Aquifer Recharge Zone. As such, the proposed roadway generated concern among several groups regarding the potential impacts to the Edwards Aquifer (a karst limestone aquifer), which is a sole-source water supply, habitat for karst invertebrates and aquatic life, and water supply for the recreational facility at Barton Springs. In 1989 in response to the former Austin Outer Loop project, a lawsuit was filed against TxDOT by Save Our Springs (SOS) and Save Barton Creek Association (SBCA). The Barton Springs/Edwards Aquifer Conservation District (BSEACD) intervened on the lawsuit. Through a 1990 settlement consent decree, TxDOT agreed to implement measures that mitigate the potential effects of the proposed highway. Those measures included constructing hazardous material traps and filtration ponds, placing signs to educate the public about the location of the recharge zone along the highways, limiting highway access points and their associated secondary impacts, and completing a study of roadway runoff contamination. In 2010, the City of Austin (COA) Watershed Protection Department completed a dye trace study to simulate accidental spills in selected portions of the area between MoPac South and FM 1626. COA published the results of the dye trace study in a report dated October 2012; and they concluded that "an accidental spill from the SH45 SW and MoPac South intersection area can be expected to recharge into the Edwards Aquifer and initially arrive at Barton Springs within two to four days under high aquifer discharge conditions. Slower initial arrival times of about three weeks can be expected under drought conditions, on the basis of previous studies" (Hauwert et al., 2004a).

In response to the community's sensitivity to potential future impacts to the Edwards Aquifer resulting from possible accidental spills from vehicles, tanker trucks, etc. traveling along the proposed SH45 SW and a desire to plan for the implementation of appropriate measures during highway construction and operation to protect the aquifer, TxDOT compiled and analyzed spill data for three analogous roadways in Travis County from federal, state, county, and city databases for the time period of 2003 – 2012 to attempt to quantify the probability of an accidental spill of hazardous liquids occurring on the proposed 3.5-mile highway and impacting karst habitat and the aquifer. This report summarizes these activities and the conclusions.

2 Spill Data Compilation and Analysis

TxDOT compiled roadway hazardous materials spill data for mobile sources for the period of record 2003 – 2012, a period spanning ten years, from the following federal, state, county, and city databases:

- U.S. Department of Homeland Security and U.S. Coast Guard, Nation Response Center (NRC) Emergency Response Notification System (ERNS) Database
- U.S. DOT - Hazardous Materials Incident Report Subsystem (HMIRS) of the Pipeline and Hazardous Materials Safety Administration (PHMSA) Hazardous Materials Information System https://hip.phmsa.dot.gov/analytics SOAP/
- U.S. DOT - Bureau of Transportation Statistics (BTS) http://www.rita.dot.gov/bts/data_and_statistics/databases
- National Transportation Safety Board (NTSB), http://www.ntsb.gov/investigations/reports_hazmat.html

- TCEQ Spill Reports Database
- TxDOT Crash Records Information System (CRIS) database is managed by the Traffic Operations Division, Crash Records Section of TxDOT.
- City of Austin (COA) Fire Marshall and Travis County Fire Marshall (these data are stored in two databases); the National Fire Information Reporting System (NFIRS), http://www.nfirs.fema.gov/documentation/reference/; and the Austin Fire Department (AFD) Computer-Aided Dispatch (CAD).

These databases reflect reports from first responders to vehicular accidents where hazardous materials were spilled. Of these only the NRC-ERNS, USDOT-PHMSA, TCEQ Spill Report, and TxDOT's CRIS databases provided usable data that contained sufficient location and spill record information for the purposes of this study. The USDOT-BTS, NTSB and COA databases did not provide usable data, as they contained only statewide-level data, lacked data for Travis County, or lacked sufficient structure and detail to be electronically queried. Visiting governmental offices to conduct research was beyond the scope of this project. The assumption is that the historic data from the usable sources will represent potential future events, at least from a statistical perspective. The usable data were sorted according to the following attributes:

- Identification (ID) - internal identification of spill location
- Year – year spill occurred
- Location – location of spill
- Latitude and Longitude – latitude and longitude of spill location
- Type of Material Spilled – solid, liquid, gas, unknown
- Substance Spilled – fuel, gasoline, sewage, etc.
- Volume – gallons of spill material
- Source of Data – agency from which data was acquired

Data containing sufficient geospatial references, such as latitude/longitude, street address, road intersection, etc., were entered into data tables. The data tables were then used to create a shapefile for each of the four usable data sources in TxDOT's graphic information system (GIS) using ArcGIS 10. The four shapefiles were then consolidated into a single shapefile.

In order to conservatively estimate the number of spills per vehicle-mile traveled (VMT) on roadways in Travis County analogous to the proposed SH45 SW during 2003 - 2012, TxDOT included reported mobile source spills of hazardous liquids regardless of volume. Approximately 23 percent of the data (39 out of 172 records) did not include spill location data sufficient to locate it on a map. In these cases, the data, if of sufficient quality, were used to develop county-wide spill statistics. The details of the statistical analysis of the data are presented later in this report.

3 Traffic Volume Statistics/Vehicle Miles Traveled

In order to analyze potential traffic volumes on the proposed SH45 SW, TxDOT acquired and evaluated traffic volume data, specifically in the form of current annual average daily traffic (AADT) counts, for similar existing highways and parkways in Travis County for 2012. AADT is a measure of the total volume of vehicle traffic of a segment of highway or road for a year divided by 365 days. It is a useful and simple measurement of how busy the road is. AADT data are collected for multiple twenty-four hour periods. The counts are done during the non-summer weeks; excluding Fridays, Saturdays, Sundays, and holidays. The AADT typically includes

both directions and frontage roads, if applicable; however, for this analysis only main lane data for year 2012 were used. A Weighted 2012 AADT was calculated by multiplying current AADT values by length of road segment, summing these weighted values, and then dividing this sum by the sum of road segment lengths. The Weighted 2012 AADT can be converted to daily vehicle miles traveled (2012 DVMT) and annual vehicle miles traveled (2012 AVMT). DVMT is calculated by multiplying the Weighted AADT by the length of the highway or parkway segment, and AVMT is the DVMT multiplied by 365 days per year.

In addition to the 2012 AADT count, TxDOT also queried and analyzed its roadway data management system to identify sections of existing highways and parkways in Travis County that have design characteristics and functional classifications most similar to the proposed SH45 SW. Once these were identified, then the traffic volume data for these analogous sections of highway and parkway were compiled and analyzed.

Based on the above listed criteria, the most analogous highways and parkways in Travis County to the proposed SH45 SW were identified and the traffic volume for each compiled. The three most analogous highways/parkways are existing SH45 (from RM 1826 to MoPac South), existing SH45 SE (from IH 35 to SH 130), and State Loop 360. A summary of the Weighted 2012 AADT, 2012 DVMT, and 2012 AVMT data for each analogous highway and parkway is presented in Table 1.

Table 1: Summary of Weighted 2012 AADT, DVMT and AVMT Data for Travis County Highways/Parkways Most Analogous to the proposed SH45 SW

Analogous Highway or Parkway	Length (miles)	Weighted 2012 AADT (vehicles per day)	2012 DVMT (vehicle-miles)	2012 AVMT (vehicle-miles)
Existing State Highway 45 SE (IH35 to SH130)	11.3	11,803	133,248	48,635,368
Existing State Highway 45 (RM1826 to MoPac South)	2.6	13,509	35,111	12,815,344
State Loop 360	14.0	47,937	671,118	244,958,200

AADT is Annual Average Daily Traffic, which is the total volume of vehicle traffic of a highway or road for a year divided by 365 days.

DVMT is Daily Vehicle Miles Traveled, which is the AADT for each segment highway or parkway multiplied by the length of the highway or parkway segment.

AVMT is Annual Vehicle Miles Traveled, which is DVMT multiplied by 365 days per year.

The 2012 DVMT for the analogous existing SH45 (RM1826 to MoPac South), existing SH45 SE (IH35 to SH130), and State Loop 360 were 35,111, 133,248, and 671,118 vehicle miles traveled, and the 2012 AVMT were approximately 12.8 million, 48.6 million, and 244.9 million vehicle miles traveled.

4 Statistics of Spills 2003-2012

A total of 172 mobile source (i.e., vehicles, tanker trucks, etc.) hazardous materials spill incidents in Travis County were identified for calendar years 2003 – 2012 (a ten-year period of record). A summary of the number of events in the dataset is presented in Table 2. Of the events, 14 spills were of unknown or unrecorded material, 1 comprised solid material, and 13 were gaseous and irrelevant for subsequent analysis. Of the 144 liquid spills, the records for 43 included an estimate of the volume of material spilled.

Table 2: Summary of Travis County hazardous material spill incidents for the period 2003 – 2012

Year	Count	Material			
		Unknown	Liquid (*)	Solid	Gas
2003	12		12 (3)		
2004	11		11 (2)		
2005	19	1	18 (5)		
2006	18		16 (5)		2
2007	14		14 (7)		
2008	13		12 (5)	1	
2009	4		4 (1)		
2010	22	2	18 (2)		2
2011	20	4	14 (6)		2
2012	39	7	25 (7)		7
Total	172	14	144 (43)	1	13

(*) The parenthetical data in the Liquid column gives the number of liquid spills for which spill volume was recorded.

The numbers of events presented in Table 2 were normalized by dividing the entries in each row by the number of spills reported in each year of the study period. In addition, the last row contains percentages for the entire sample. That is, the last row is based on the number of occurrences for each column over the entire period of record. The results of this computation are displayed in Table 3.

Table 3: Percentage of recorded spills by category

Year	Material			
	Unknown	Liquid (*)	Solid	Gas
2003		100.0 (25.0)		
2004		100.0 (18.2)		
2005	5.3	94.7 (26.3)		
2006		88.8 (27.7)		11.1
2007		100.0 (50.0)		
2008		92.3 (38.5)	7.7	
2009		100.0 (25.0)		
2010	9.0	81.8 (9.0)		9.0
2011	20.0	70.0 (30.0)		10.0

2012	17.9	64.1 (17.9)		17.9
Total	8.1	83.7 (25.0)	0.6	7.6

(*) The parenthetical data in the Liquid column gives the proportion of liquid spills for which spill volume was recorded.

For the majority of the years in the study period the number of unknown material spill events was zero or a relatively small fraction of the sample, with the number of events in years 2011 and 2012 being noticeably higher than the other years. The reasons for these increases were not investigated; such an effort is outside the scope of this project. The fraction of spills recorded that were liquid and that included an estimate of volume recorded as part of the reporting process was 25 percent or greater for the majority of years in the study period. Approximately 8 percent of recorded spills constituted solids or gases. Solids are relatively easy to confine to the spill site and gases cannot be confined to the spill site. This result reinforces TxDOT's decision to focus the study on only hazardous liquid spills.

In June 2011, Texas Tech University, under contract to TxDOT, published a report (David B. Thompson, et al, June 6, 2011) that analyzed the occurrence and statistics of hazardous material spill incidents for mobile sources along all Texas highways (not only those in Travis County) for the five-year period of 2002 – 2006, as compiled by TCEQ. The report examined the statistical distribution of hazardous liquid spill volumes. They found that hazardous liquid spills observed on roadways in the entire state during 2002-2006 were distributed according to the following percentiles:

- 50 percent – 60 gallons or less
- 67 percent – 100 gallons or less
- 83 percent – 300 gallons or less
- 90 percent – 820 gallons or less
- 95 percent - 2,500 gallons or less
- 99 percent - 20,000 gallons or less

Therefore, 95 percent of the hazardous liquid spills from mobile sources observed in Texas during 2002 – 2006 were 2,500 gallons or less, and 99 percent of spills were about 20,000 gallons or less.

This statistical distribution includes areas outside of Travis County that typically experience more frequent liquids transportation on roadways, especially associated with commerce occurring in and between large industrial complexes. As such, the percentiles likely represent a conservative (overstated) condition with respect to actual conditions in Travis County. In other words, the same percentiles for Travis County alone would likely reflect smaller spills.

Furthermore, the probability of the occurrence of a spill greater than 10,000 gallons (only half of the 20,000 gallon value mentioned above) is extremely low due in large part to the fact that the amount of hazardous material that may be legally shipped on public highways is regulated by 23CRF§658, and federal highway regulations limit the weight of a motorized cargo vehicle to 80,000 pounds gross weight. This means that a tanker truck is limited to approximately 10,000 gallons of liquid or less depending on the specific gravity of the material (John A. Marler, et al, September 2005). This indicates that a spill of greater than 10,000 gallons would be extremely rare and require, for example, two tanker trucks to be involved in an incident and simultaneously spill. Nonetheless, industry-leading hazardous material traps and filtration ponds will be engineered for the proposed SH45 SW project to more than adequately confine and contain the appropriate worst-case spill volume to ensure adequate protection of the environment.

For the three analogous highways/parkways identified in Section 3, TxDOT calculated hazardous liquid spill rates for the corresponding 2012 AVMT. Our analysis only included main lanes (i.e., no frontage roads, etc.). Because the 2012 DVMT only represented that year and the spill data covered a ten year period (2003 – 2012) for the existing SH45 (RM1826 to MoPac South) and State Loop 360 and a 3.7 year period (May 2009 – 2012) for SH45 SE (IH35 to SH130), the average annual number of spills was calculated by dividing the number of spills by ten and 3.7, respectively. For each analogous highway/parkway, the number of

hazardous liquid spills for 2003 - 2012, average annual number of spills, and number of spills per AVMT are summarized in Table 4.

Table 4: Hazardous Liquid Spills for 2003 – 2012, Average Annual Number of Hazardous Liquid Spills, and Hazardous Liquid Spills per AVMT

Analogous Highway or Parkway	Number of Hazardous Liquid Spills 2003 – 2012(*)	Average Annual Number of Hazardous Liquid Spills	2012 AVMT (vehicle-miles)	Hazardous Liquid Spills per Billion VMT (spills/billion vehicle-miles)
Existing State Highway 45 SE (IH35 to SH130)	1	0.27(*)	48,635,368	5.6
Existing State Highway 45 (RM1826 to MoPac South)	0	0	12,815,344	0
State Loop 360	0	0	244,958,200	0

(*) For SH45 SE the time period is only 3.7 years of the 10-year period, as it was opened to traffic in May 2009.

For the ten year period, and accounting for the 3.7 year period for SH45 SE, the maximum frequency of recorded hazardous liquids spills on the three analogous highways/parkways was 5.6 spills per billion vehicle miles traveled. This equates to no spills on existing SH45 (RM1826 to MoPac South) and State Loop 360 over 10 years with approximately 2.58 billion vehicle miles traveled, and one spill on existing SH45 SE (IH35 to SH130) over 3.7 years with approximately 0.18 billion vehicle miles traveled.

5 Conclusions

1. The 2012 DVMT for the analogous existing SH45 (RM1826 to MoPac South), existing SH45 SE (IH35 to SH130), and State Loop 360 were 35,111, 133,248, and 671,118 vehicle miles traveled, and the 2012 AVMT for the same three roadways were approximately 12.8 million, 48.6 million, and 244.9 million vehicle miles traveled.

2. Records of hazardous material spill incidents for mobile sources on highways and parkways in Travis County for the period of 2003 – 2012 were obtained from four publically available databases. A total of 172 spill incidents were available for analysis. Materials comprising gases, solids, and unknown materials were eliminated from further analysis. The remaining 144 hazardous liquid spill incidents were examined.

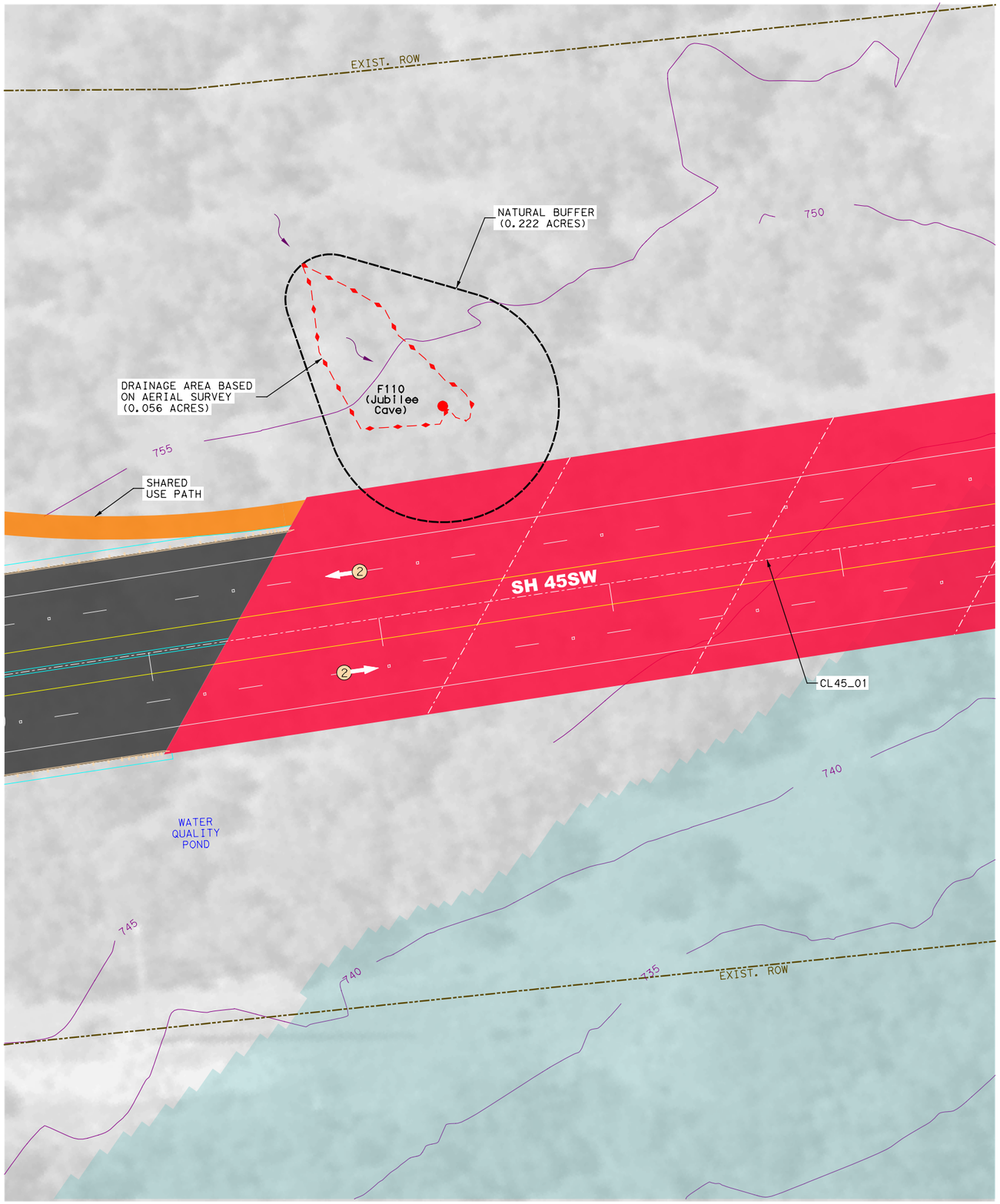
3. TxDOT calculated a maximum of 5.6 spills per billion vehicle miles traveled occurred on one of three parkways and highways in Travis County that are most similar to the proposed SH45 SW during 2003 - 2012. One spill occurred only on existing SH45 SE (IH35 to SH130) during its 3.7 operation history with approximately 0.18 billion vehicle miles traveled. No spills occurred on either of the other two analogous parkways or highways over a 10 year period with approximately 2.58 billion vehicle miles traveled.

4. Texas Tech University's June 2011 report indicated that over 90 percent of hazardous liquids spills from mobile sources in Texas for 2002 - 2006 were less than 820 gallons.

6 Additional References

- Marler, John A., Barrett, Michael E., and Malina, Joseph, September 2005, Hazardous Materials Traps Transport Spill Containment for Stormwater Pollution Prevention along Texas Highways. Center for Research in Water Resources, Bureau of Engineering Research, The University of Texas at Austin, J.J. Pickle Research Campus, Austin, TX 78712. Technical Report, CRWR 05-06.

- Thompson, David B., Morse, Audra, and Acker, Jenna, June 6, 2011, Analysis of the Occurrence and Statistics of Hazardous Materials Spill Incidents along Texas Highways and Suggestions for Mitigation of Transport-Related Spills to Receiving Waters. Center for Multidisciplinary Research in Transportation, Department of Civil and Environmental Engineering, Texas Tech University, P.O. Box 41023, Lubbock, Texas 79409-1023. Research Report Number 0-5200-1, Project Number 0-5200.



0 25′ 50′

SCALE IN FEET

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BRIDGE DRILL SHAFT CONSTRUCTION WITHIN THE NATURAL BUFFER SHALL BE AVOIDED TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.

INTERIM REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF WADE E. STRONG, PE 61841 ON 11/17/2014
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SH 45SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

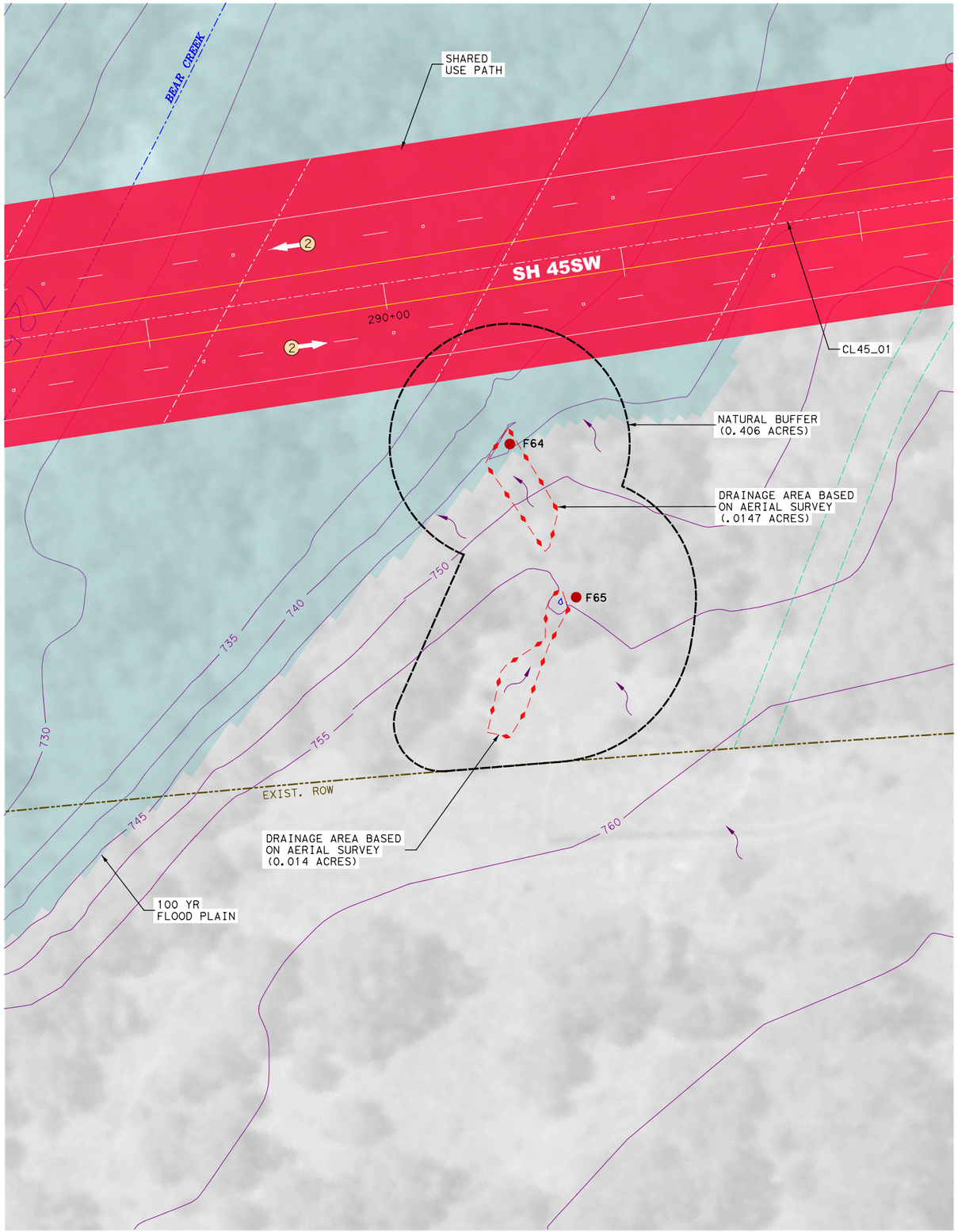
Texas Department of Transportation®

DATE: 11/17/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F110
JUBILEE CAVE
DRAINAGE DETAILS

11/17/2014
P:\8140403\dlv\planSht\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 1.dgn



CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

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2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
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0 25′ 50′
SCALE IN FEET

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

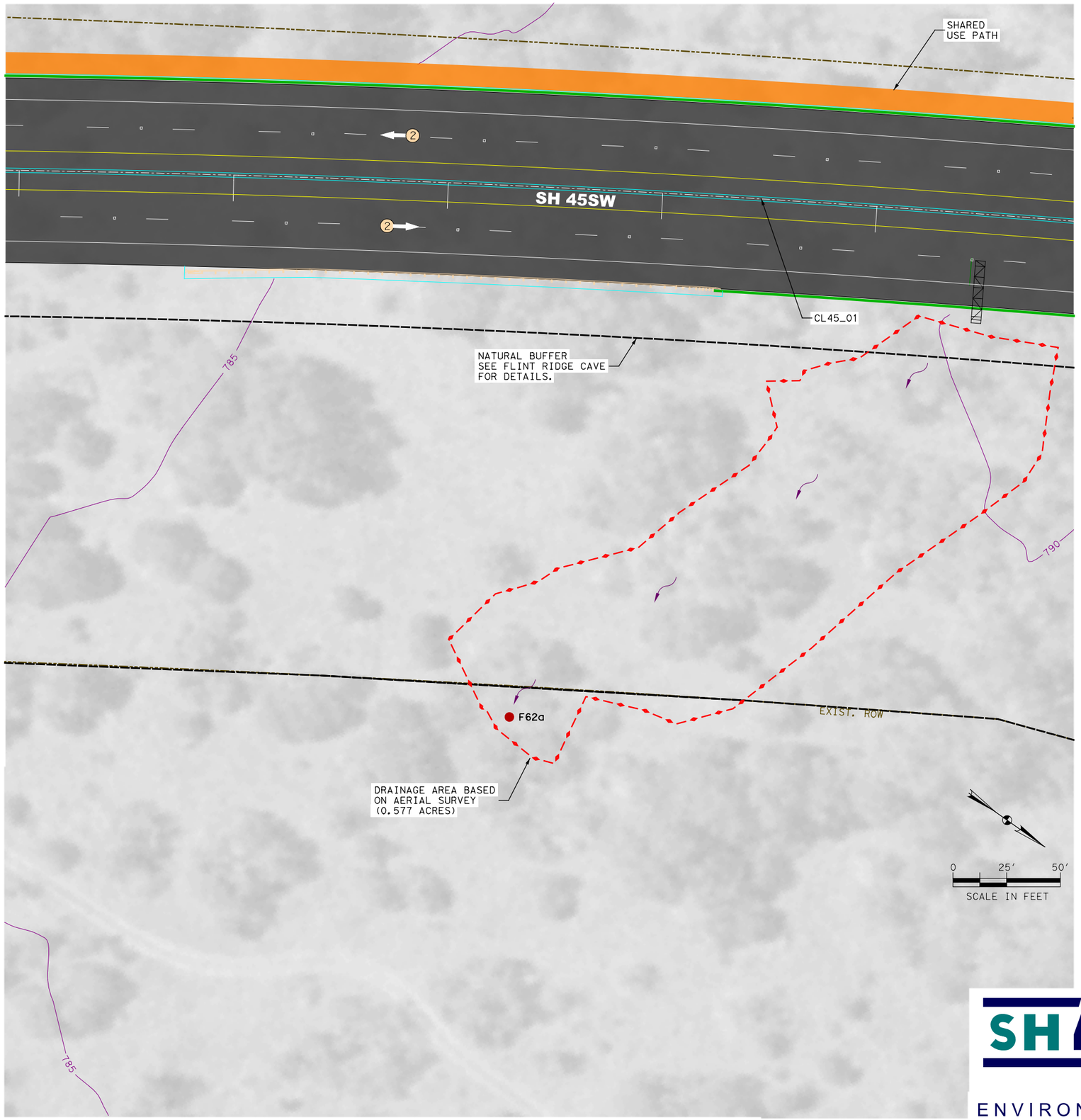
Texas Department of Transportation®

DATE: 11/17/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES F64 & F65
DRAINAGE DETAILS

11/17/2014
P:\8140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 2.dgn



NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
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Texas Department of Transportation®

SH 45SW
ENVIRONMENTAL STUDY

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F62a
DRAINAGE DETAILS

10/27/2014
P:\8140403\dlv\planSht\Schematics\DETAIL SHEET 3.dgn

NOTE:
1. THE PROPOSED ROADWAY REMOVES 0.7 ACRES OF DRAINAGE AREA. A COMPENSATORY AMOUNT OF DRAINAGE AREA WILL BE RE-ROUTED FROM THE HATCHED AREA SHOWN INTO FLINT RIDGE CAVE.

EXIST. R.O.W.

WATER QUALITY POND

CL45_01

F55

12'x4' CON-SPAN

SH 45SW

315+00

330+00

RETAINING WALL

F41

F62a

FLINT RIDGE CAVE

FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT

CROSS-HATCHED AREA REPRESENTS 0.7 ACRES OF FLINT RIDGE CAVE DRAINAGE AREA THAT IS REMOVED BY ROADWAY CONSTRUCTION

HATCHED AREA REPRESENTS A MINIMUM EQUIVALENT DRAINAGE AREA THAT WOULD BE RE-ROUTED TO FLINT RIDGE CAVE AS NEEDED TO REPLACE DRAINAGE AREA BEING REMOVED BY THE ROADWAY DESIGN

COMBINED NATURAL BUFFER FOR FLINT RIDGE CAVE SUB-SURFACE FOOTPRINT, FEATURE F-62a and FEATURE F-41. THIS AREA TO BE FREE FROM CONSTRUCTION EXCEPT FOR TEMP/PERM BMP & EMBANKMENT CONSTRUCTION OPERATIONS. (11.99 ACRES)

DRAINAGE AREA BASED ON AERIAL SURVEY (55.53 ACRES)

DRAINAGE AREA BASED ON 2012 2' LIDAR (54.50 ACRES)

CRICKET FORGING AREA (105 METER RADIUS)

LEGEND

- F62a ● = SENSATIVE KARST FEATURE
- = DRAINAGE AREA BASED ON AERIAL SURVEY
- = DRAINAGE AREA BASED ON 2012 2' LIDAR
- = FLINT RIDGE CAVE DRAINAGE AREA (USED IN DRAFT EIS)
- = SHARED USE PATH
- = DRAINAGE FLOW DIRECTION
- = EXISTING RIGHT OF WAY
- = CRICKET FORGING AREA (105 METER RADIUS)
- = NATURAL BUFFER (CONSTRUCTION-FREE ZONE)

NATURAL BUFFERS

1. BUFFER ZONES AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF NATURAL BUFFERS AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. INTERCEPTOR SWALES AND/OR DIVERSION DIKES WILL BE USED TO TEMPORARILY DIVERT SEDIMENT LADEN RUNOFF AWAY FROM FLINT RIDGE CAVE DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

0 100' 200'
SCALE IN FEET

INTERIM REVIEW
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SH 45 SW
ENVIRONMENTAL STUDY

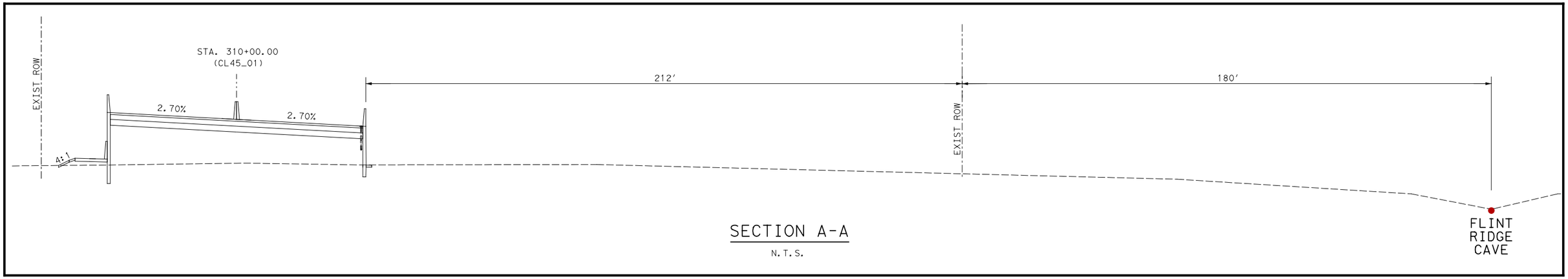
RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 1/7/2015

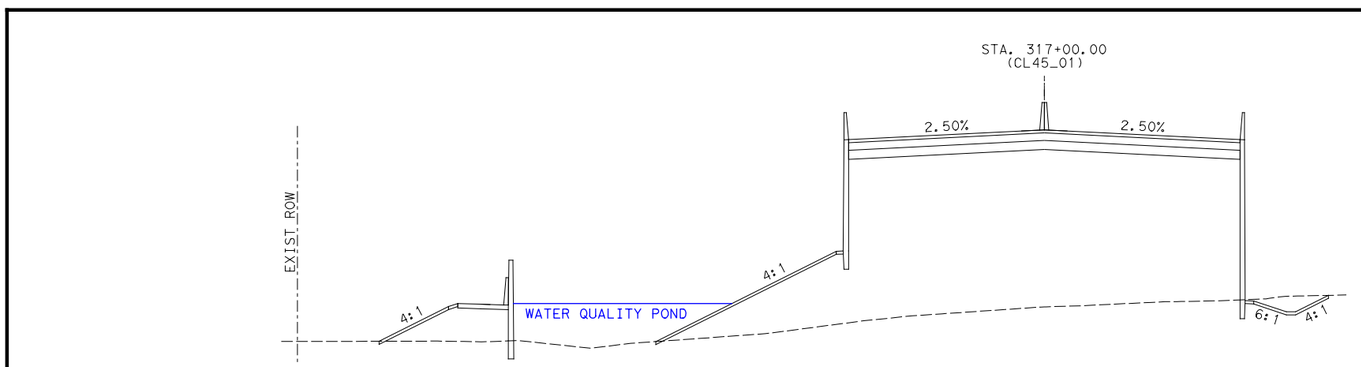
SH 45SW RIGHT OF WAY WITHIN THE AREA OF POTENTIAL EFFECTS ON FLINT RIDGE CAVE

1/7/2015
P:\81404403\dlv\planSht\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 4.dgn



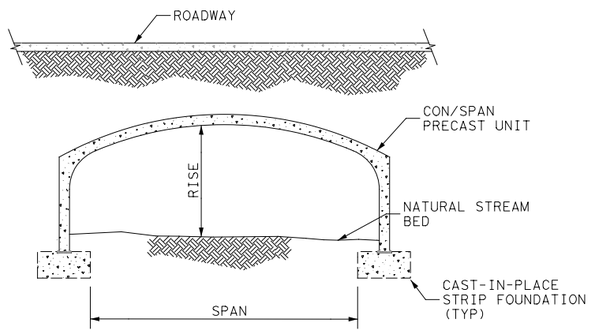
SECTION A-A

N.T.S.



SECTION B-B

N.T.S.



SECTION C-C

N.T.S.

INTERIM REVIEW

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SH 45SW

ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/19/2014

SH 45SW RIGHT OF WAY
WITHIN THE AREA OF
POTENTIAL EFFECTS ON
FLINT RIDGE CAVE

10/19/2014
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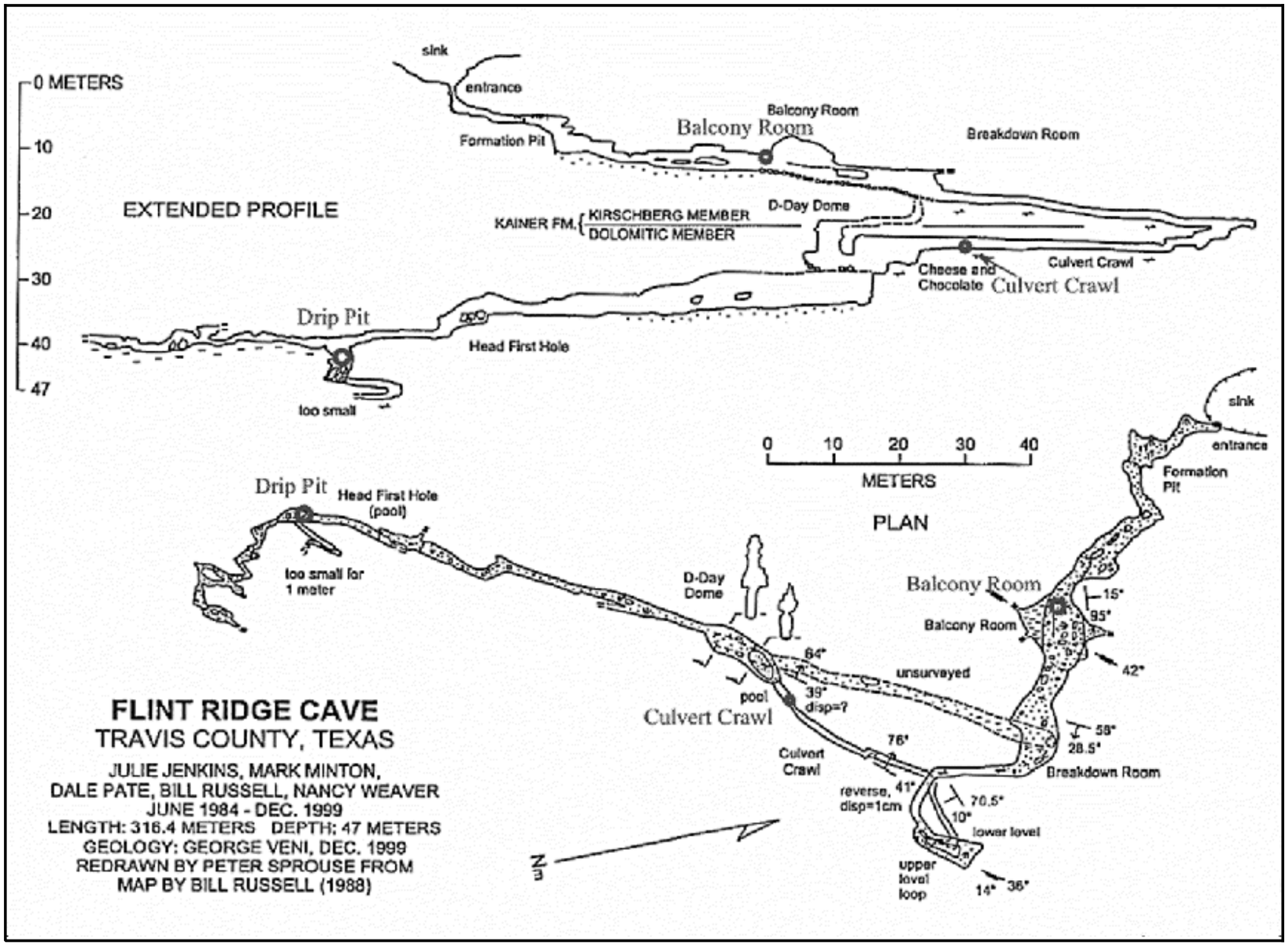

FLINT RIDGE CAVE
TRAVIS COUNTY, TEXAS

JULIE JENKINS, MARK MINTON,
DALE PATE, BILL RUSSELL, NANCY WEAVER
JUNE 1984 - DEC. 1999
LENGTH: 316.4 METERS DEPTH: 47 METERS
GEOLOGY: GEORGE VENI, DEC. 1999
REDRAWN BY PETER SPROUSE FROM
MAP BY BILL RUSSELL (1988)

INTERIM REVIEW

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FIRM #587

Texas Department of Transportation®

DATE: 10/19/2014

SH 45SW RIGHT OF WAY
WITHIN THE AREA OF
POTENTIAL EFFECTS ON
FLINT RIDGE CAVE

SH 45 SW
ENVIRONMENTAL STUDY

10/19/2014
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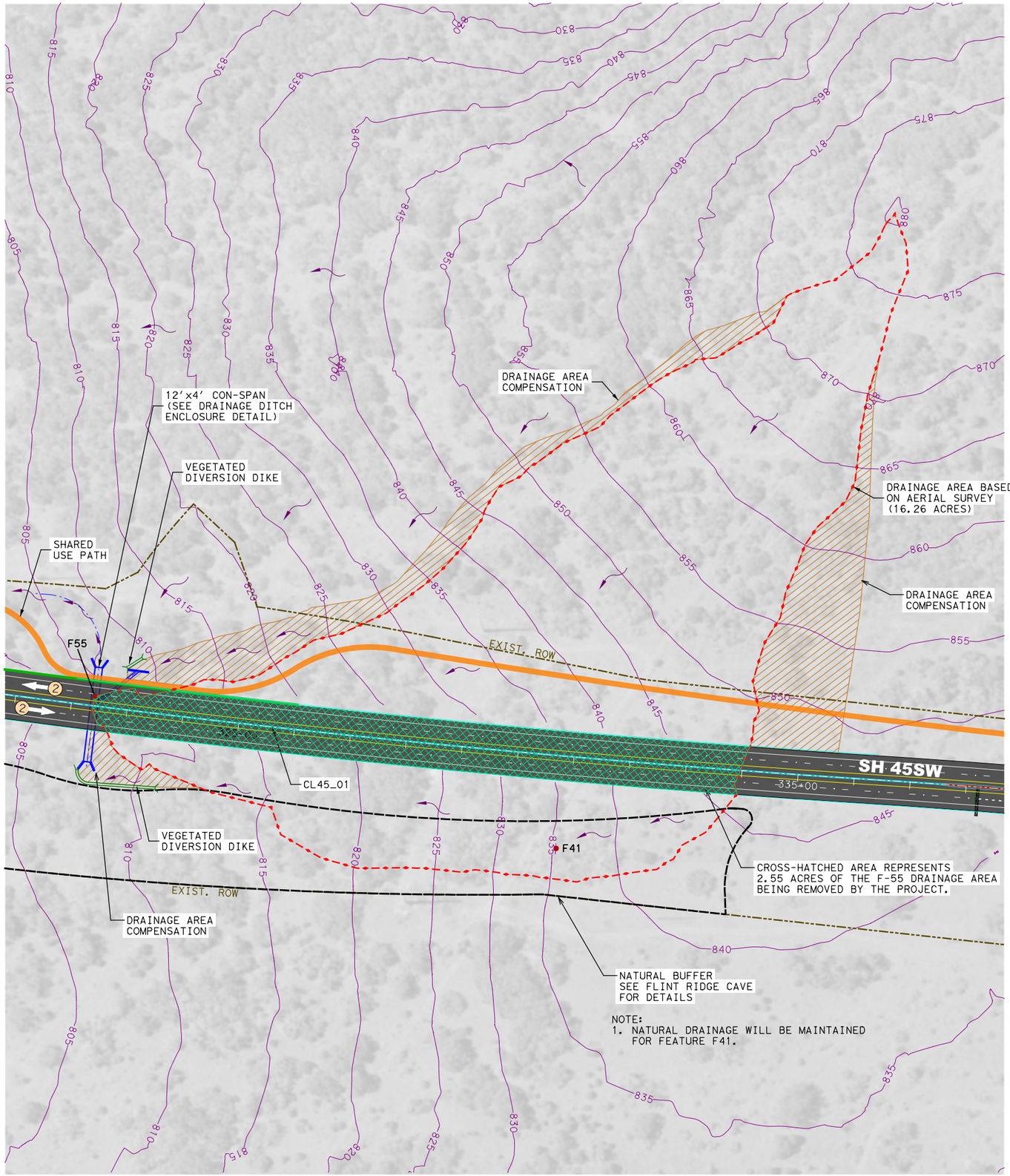

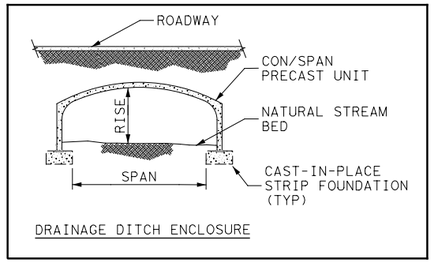

DRAINAGE DITCH ENCLOSURE

NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

NOTE:
1. THE PROPOSED ROADWAY DESIGN REMOVES 2.55 ACRES FROM THE F55 DRAINAGE AREA. A COMPENSATORY AMOUNT OF AREA FROM OFFSITE TO WEST (CROSS-HATCHED AREA SHOWN) WILL BE RE-ROUTED BACK TO THIS FEATURE.

0 100' 200'
SCALE IN FEET

INTERIM REVIEW

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

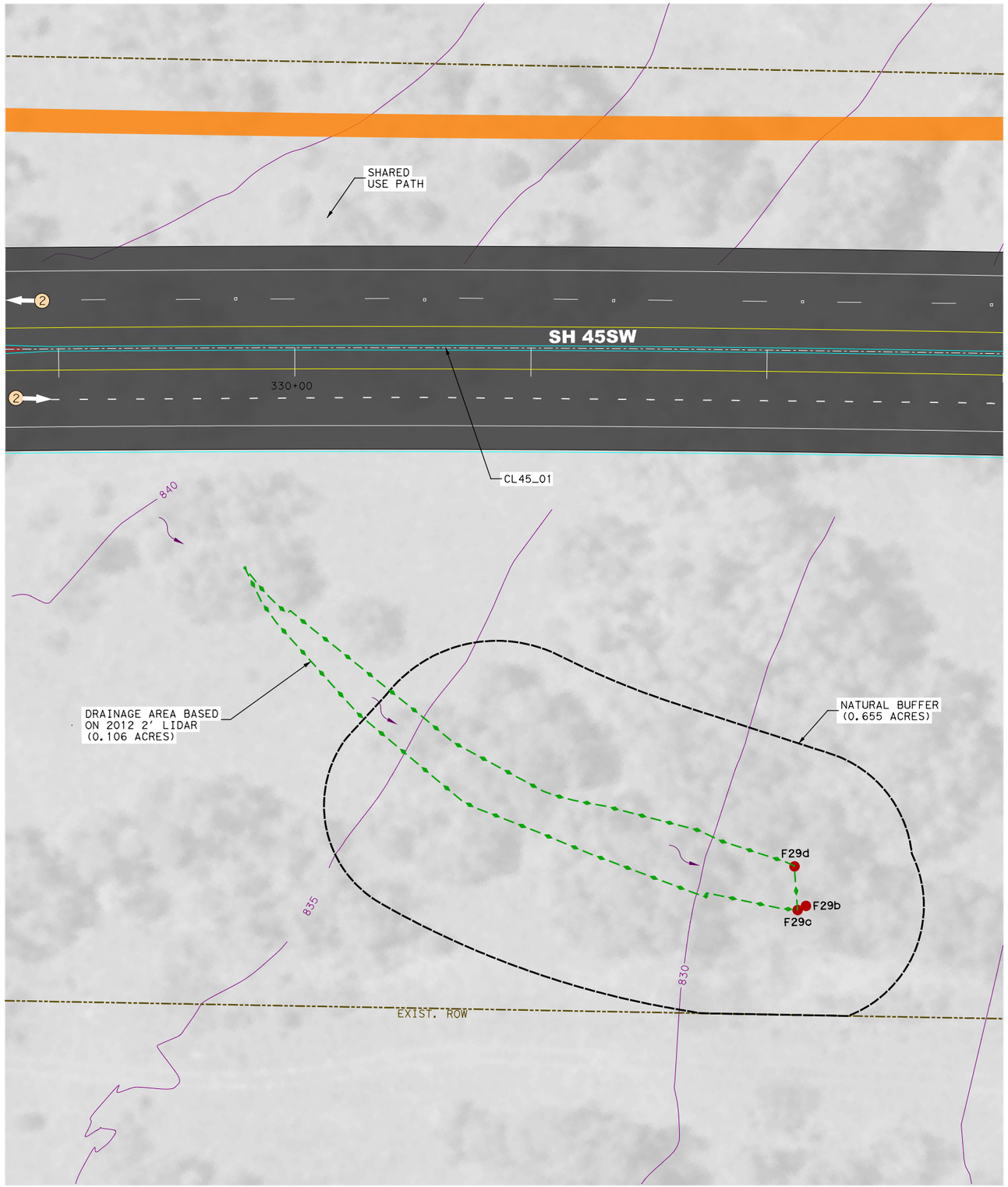
Texas Department of Transportation®

DATE: 11/25/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F55
DRAINAGE DETAILS

11/25/2014
P:\8140403\dlv\planShts\Schematics\EIS DRAINAGE SHEETS\DETAIL SHEET 5.dgn



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SCALE IN FEET

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SH 45SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES
F29b, F29c & F29d
DRAINAGE DETAILS

10/27/2014
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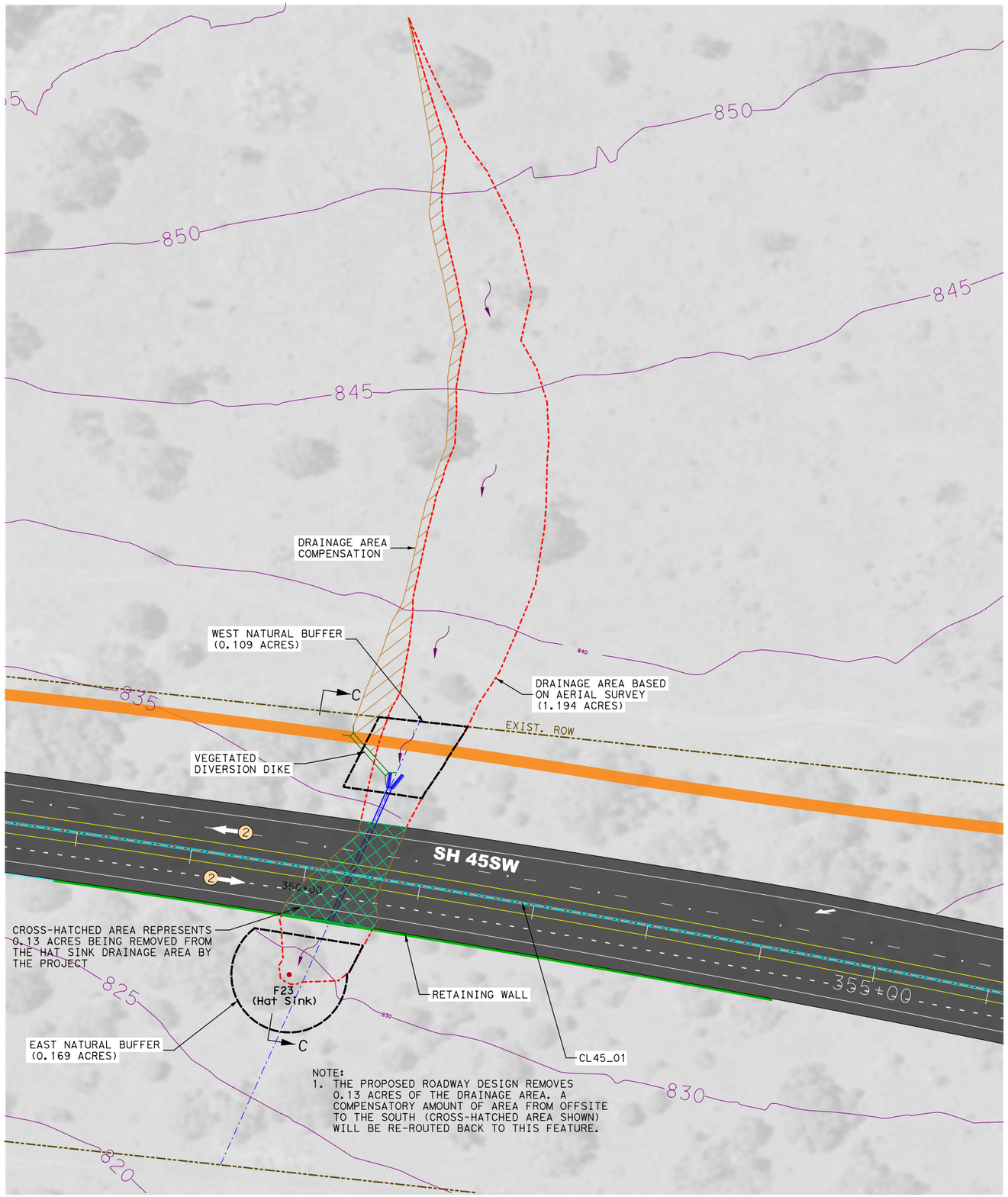

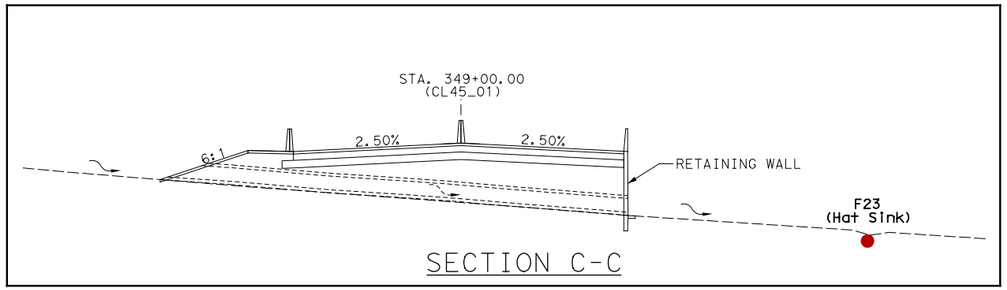

SECTION C-C

CAVE GATE CONSTRUCTION

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0 50′ 100′
SCALE IN FEET

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RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

SH 45 SW
ENVIRONMENTAL STUDY

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F23
HAT SINK
DRAINAGE DETAILS

10/27/2014
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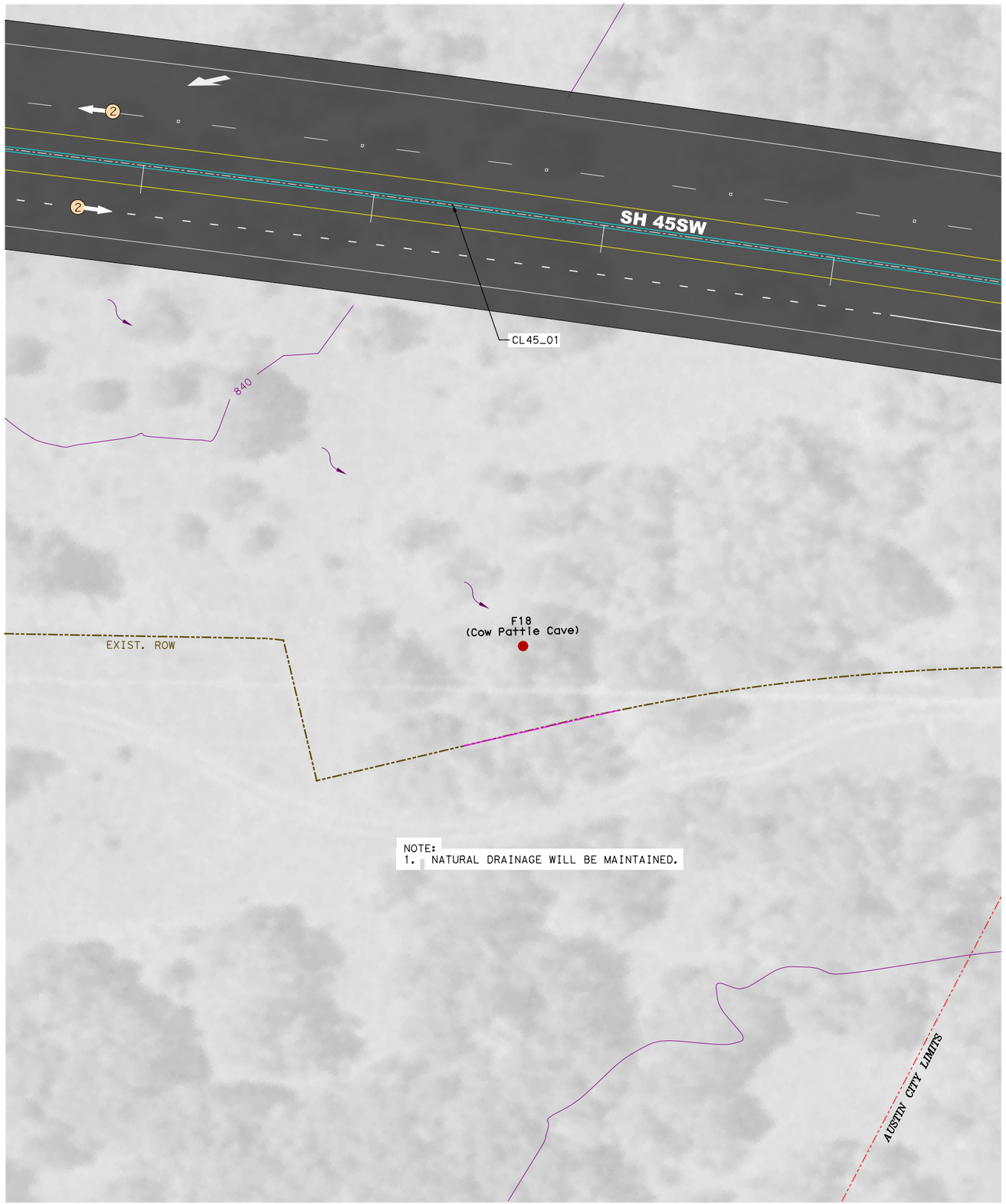

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5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
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7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

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INTERIM REVIEW

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SH 45SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F18
COW PATTIE CAVE
DRAINAGE DETAILS

10/22/2014
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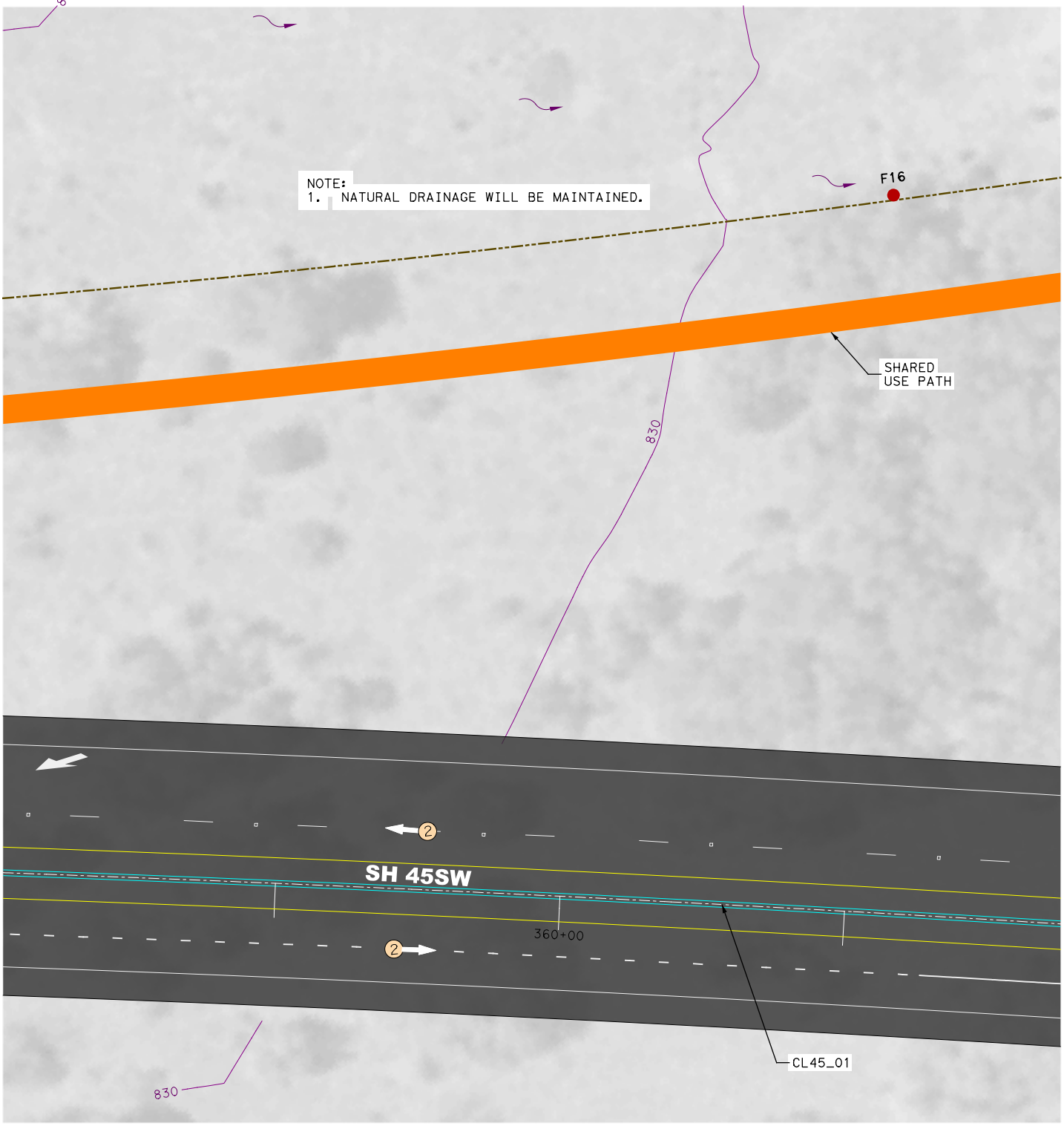

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SH 45SW ENVIRONMENTAL STUDY

SH 45SW PRELIMINARY SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F16 DRAINAGE DETAILS

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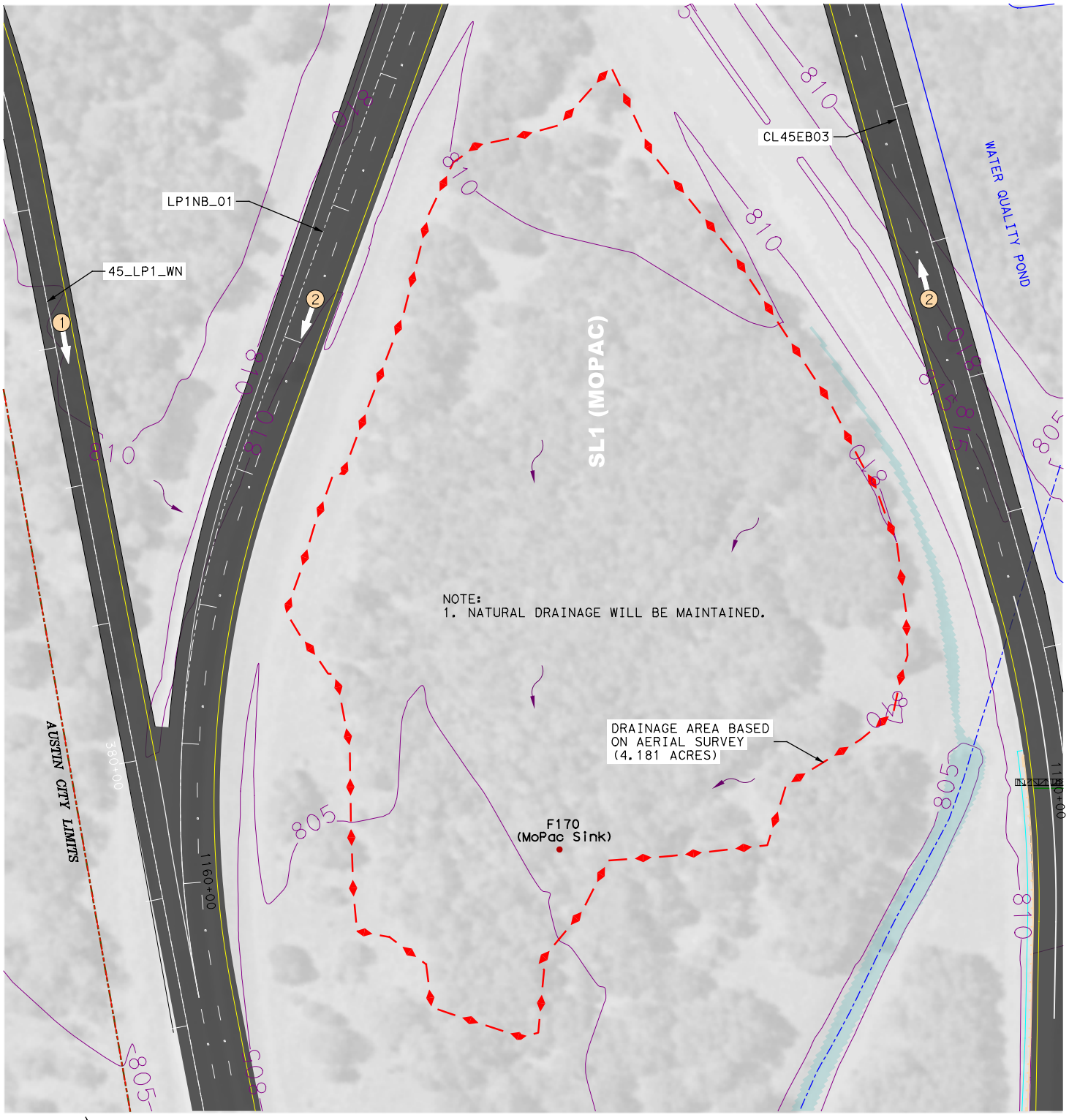

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DATE: 10/22/2014

SH 45SW

ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES F170
MOPAC SINK
DRAINAGE DETAILS

10/22/2014
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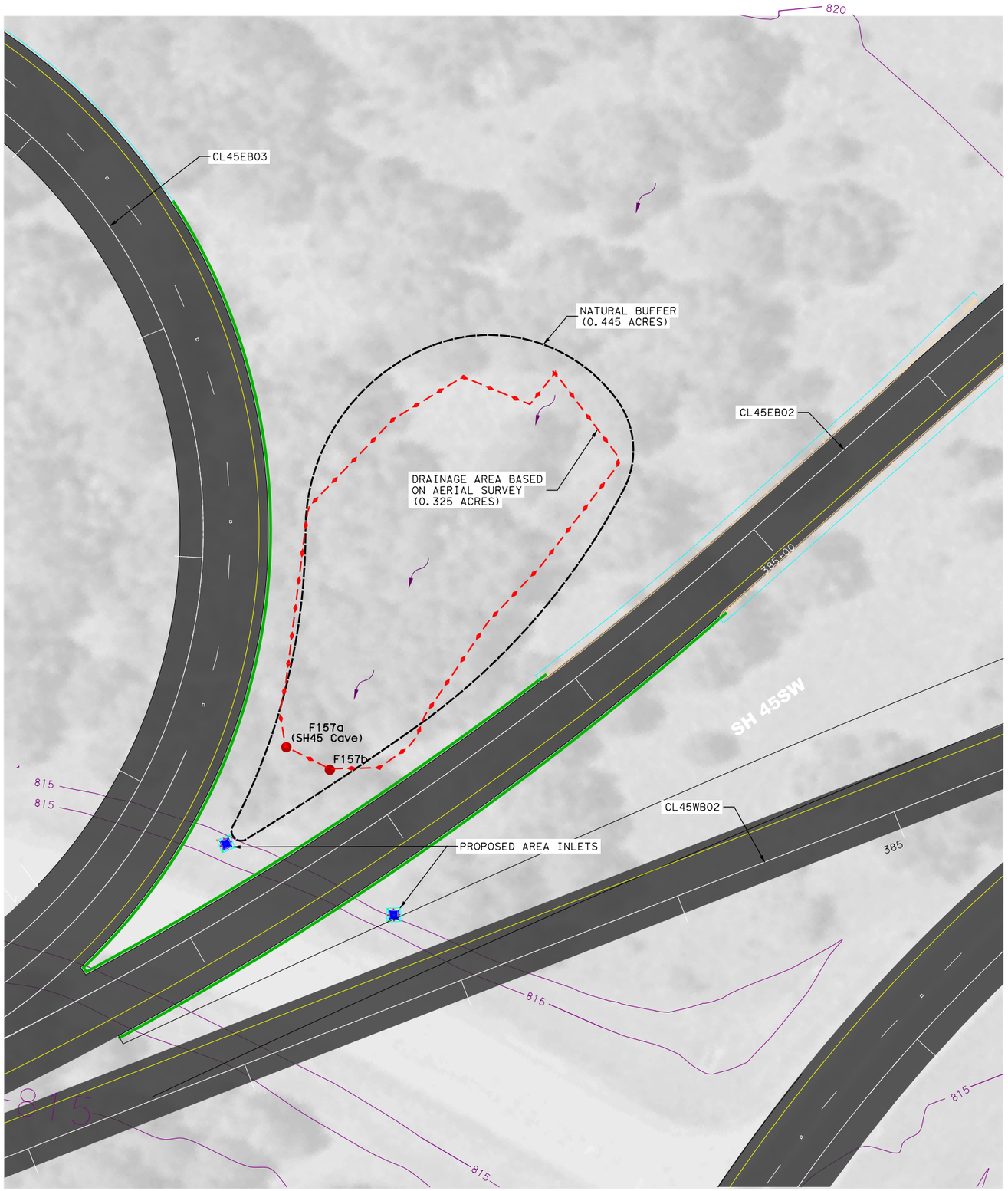

CAVE GATE CONSTRUCTION

THESE NOTES COME FROM TCEQ PUBLICATION RG-348 UNDER THE SECTION CALLED “GATE CONSTRUCTION”.

1. PLACE WELDING MAT OVER CAVE ENTRANCE TO PROTECT IT FROM WELDING RESIDUALS.
2. DRILL ANCHOR POINTS TO SOLID BEDROCK, ANCHOR GRID WITH ¼IN. TO 1 IN. REBAR FROM 8 IN. TO 10 IN. LONG.
3. WELD ANCHORS TO SUPPORTIVE CROSS BEAMS, FLAT SIDE FACING UP.
4. CONSTRUCT LEVEL HORIZONTAL GRID OF 2 IN. BY 2 IN. BY 3/8 IN STEEL ANGLE, LEAVING ROOM FOR ACCESS DOOR.
5. PLACE STEEL ANGLE ON THEIR EDGE SIDE, WITH THE ANGLE PEAK POINTED IN THE SAME DIRECTION. CONSULT A CAVE SPECIALIST FOR BEST PLACEMENT. SPACE BARS 1.5 IN. APART THROUGHOUT.
6. ACCESS DOOR IS 30 IN. SQUARE WITH HINGED DOOR AND CONCEALED LOCK BOX.
7. PROVIDE 2 IN. WIDE LOCK WITH 3/8 IN. SHACKLE.
8. CONSTRUCT HORIZONTAL STIFFENERS ACROSS ANGLE EXPANSES WITH 1 TO 2 IN. WIDE BY 3/8 IN. THICK FLAT BAR STOCK. SPACE THEM 4 TO 5 FT. APART.
9. APPLY RUST INHIBITIVE PAINT WITH HAND BRUSH.
10. REMOVE PROTECTIVE BLANKET AND ALL FOREIGN MATERIALS GENERATED.

NATURAL BUFFERS

1. BUFFERS AROUND SENSITIVE FEATURES INDICATE A CONSTRUCTION-FREE ZONE TO THE MAXIMUM PRACTICAL EXTENT.2
2. TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE PLACED AS NEAR TO CONSTRUCTION AS POSSIBLE TO MINIMIZE DISTURBANCE WITHIN THE BUFFER ZONES AND THE DRAINAGE AREA.
3. NATURAL VEGETATION WITHIN THE BUFFER ZONES SHALL BE MAINTAINED AS MUCH AS POSSIBLE. NO ORNAMENTAL GRASSES OR LANDSCAPING SHALL BE INCORPORATED WITHIN THE BUFFER ZONES OR DRAINAGE AREAS.
4. HIGH SERVICE ROCK BERMS SHALL BE PLACED AROUND THE PERIMETER OF THE BUFFER ZONES AS NEEDED TO PROTECT THE FEATURES FROM CAPTURING SEDIMENT LADEN RUNOFF DURING CONSTRUCTION. REFER TO THE TEMPORARY EROSION AND SEDIMENT CONTROL PLANS FOR ADDITIONAL DETAILS.

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SH 45 SW
ENVIRONMENTAL STUDY

RODRIGUEZ TRANSPORTATION GROUP
CONSULTING ENGINEERS
FIRM #587

Texas Department of Transportation®

DATE: 10/27/2014

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURES
F157a (SH45 CAVE) & F157b
DRAINAGE DETAILS

10/27/2014
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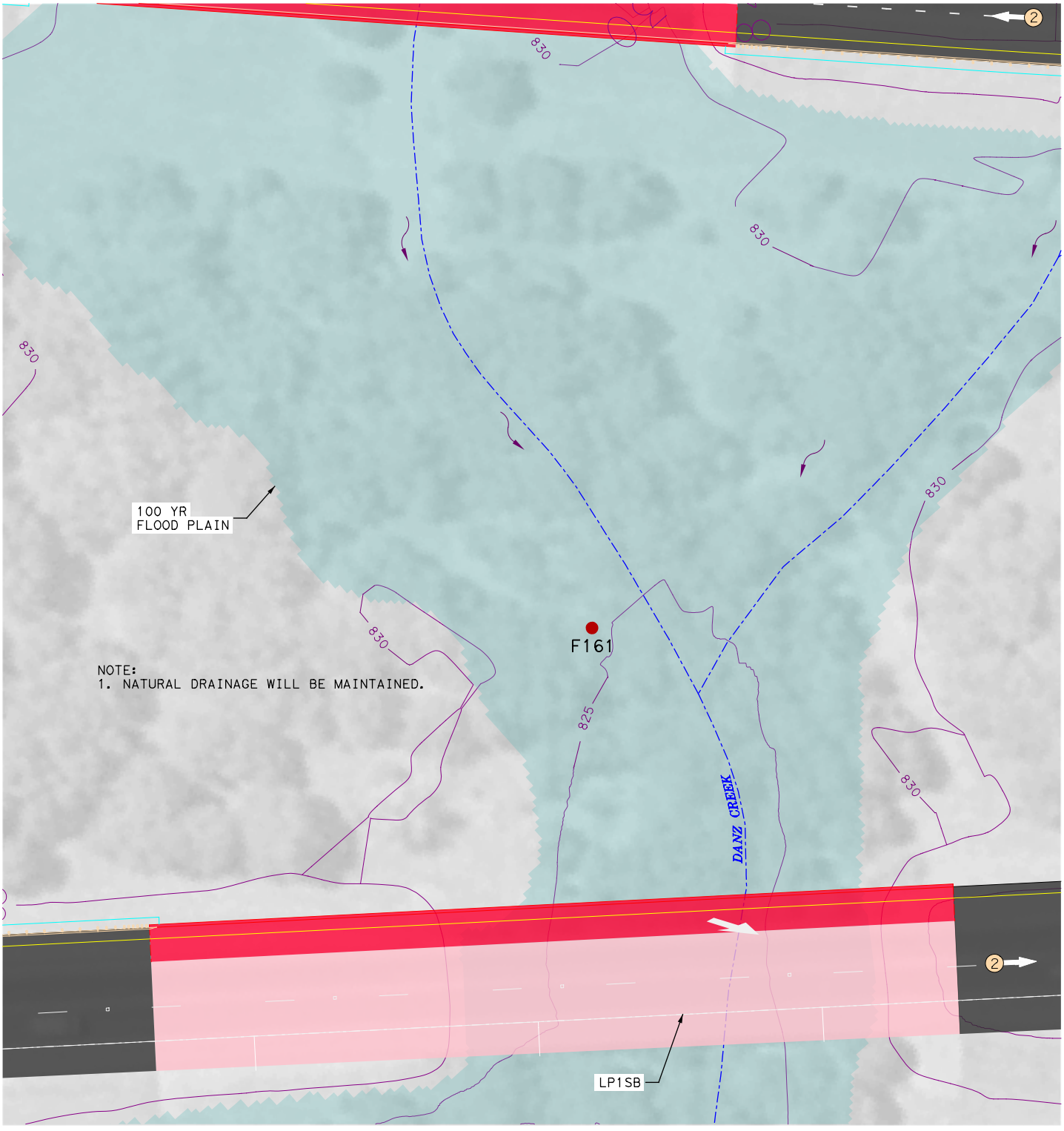

NOTE:
1. NATURAL DRAINAGE WILL BE MAINTAINED.

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DATE: 10/22/2014

SH 45SW
ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F161
DRAINAGE DETAILS

10/22/2014
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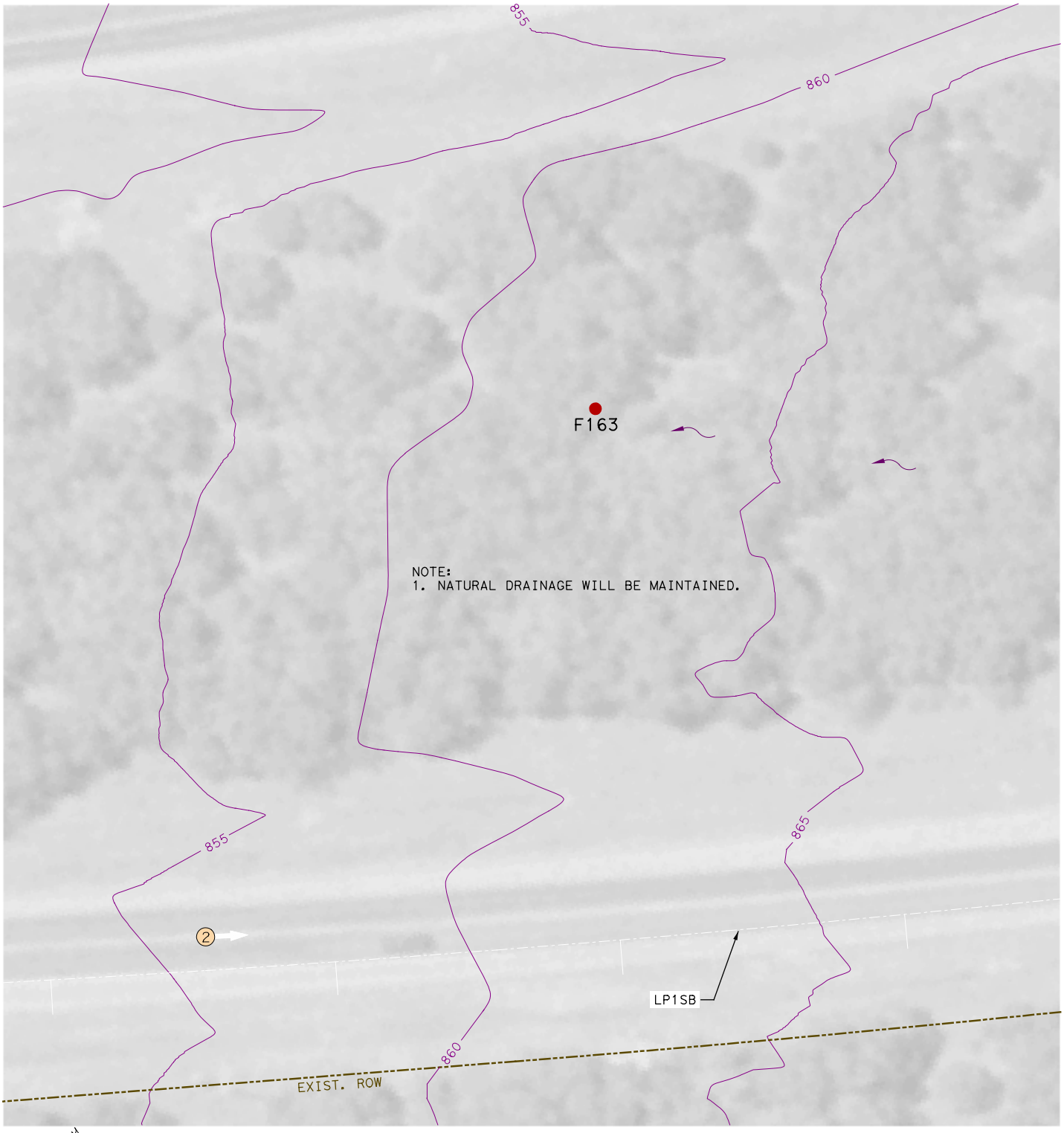

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Texas Department of Transportation®

DATE: 10/22/2014

SH 45SW

ENVIRONMENTAL STUDY

SH 45SW
PRELIMINARY
SCHEMATIC DESIGN

SENSITIVE KARST FEATURE F163
DRAINAGE DETAILS

10/22/2014
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Potential for Impacts to Endangered *Eurycea* Salamanders from the Proposed State Highway 45 Southwest Project, Travis and Hays Counties, Texas

Prepared for

Texas Department of Transportation

Prepared by

Cambrian Environmental

and

SWCA Environmental Consultants

SWCA Project No. 27070.02

November 2014

POTENTIAL FOR IMPACTS TO ENDANGERED *EURYCEA* SALAMANDERS FROM THE PROPOSED STATE HIGHWAY 45 SOUTHWEST PROJECT, TRAVIS AND HAYS COUNTIES, TEXAS

Prepared for

Texas Department of Transportation

Prepared by

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SWCA Project No. 27070.02

November 6, 2014

As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

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Cambrian Environmental
Texas Geoscience Firm Registration Number 50484
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INTRODUCTION

The purpose of this assessment is to evaluate the potential effects of the proposed State Highway 45 Southwest Project on the Barton Springs Salamander, *Eurycea sosorum*, (BSS) and Austin Blind Salamander, *Eurycea waterlooensis*, (ABS) or on designated critical habitat for the ABS. The project area is located within the recharge zone for the Barton Springs segment of the Edwards Aquifer in southern Travis and Northern Hays Counties, Texas. The project area occurs within an area demonstrated by dye trace studies to contribute groundwater to Barton Springs (BS/EACD 2003, Hauwert 2009) which is the only known location for the ABS and which may be the only known location for the BSS. Emerging research on the phylogeography of Texas *Eurycea* indicates that several other locations may be occupied by the BSS (Chippindale 2014), including two that are within 2 miles of the project area. Both salamanders are listed as endangered under the Endangered Species Act (U.S. Fish and Wildlife Service [USFWS] 2013). The potential for impacts to listed resources from the proposed project depends on the likelihood of water quality or quantity degradation and the proximity of listed resources to the project. Figure 1 depicts the location of the project relative to known and potential locations of listed resources.

Both the BSS and the ABS are small (about 2 inches), entirely aquatic salamanders found in springs, spring runs, wet caves, groundwater, and spring-fed tributaries (78 Fed. Reg. 51279). Habitat for the salamander is closely associated with the Edwards Aquifer. Urbanization and declines in water quality and quantity in the aquifer are cited by the USFWS as the primary threats to the species (78 Fed. Reg. 51322). However, little is known of the biological needs of the species beyond their preference for cool, clear spring water and large cobble substrate, and their use of subsurface habitat within the underground aquifer (78 Fed. Reg. 51279). No toxicological studies have been completed that demonstrate specific responses by either species to changes in water quality. While the species are known to periodically retreat underground into spring conduits, how much of their life cycle is spent underground is unknown. The ABS is morphologically adapted to the subterranean aquifer to a greater degree than the BSS and therefore likely spend more of its life cycle in the subsurface. Recent research (Chippindale 2014) indicates that some level of gene flow is occurring or has recently occurred between sites occupied by the BSS. It is unknown whether this gene flow is the result of transient, low-frequency use of aquifer conduits between spring sites or whether it indicates regular occupation of conduit habitat to a degree that was previously unanticipated.

The habitat components, or primary constituent elements (PCEs), used by the USFWS to delineate critical habitat in the final rule are as follows:

Surface Habitat PCEs extending 80 meters or 262 feet from a spring outlet or cave

i. Water from the Trinity Aquifer, northern segment of the Edwards Aquifer, and local alluvial aquifers. The groundwater is similar to natural aquifer conditions as it discharges from natural spring outlets. Concentrations of water quality constituents and contaminants should be below levels that could exert direct lethal or sublethal effects (such as effects to reproduction, growth, development, or metabolic processes), or indirect effects (such as effects to the Jollyville Plateau salamander's prey base). Hydrologic regimes similar to the historical pattern of the specific sites are present, with at least some surface flow during the year. The water chemistry is similar to natural aquifer conditions, with temperatures from 64.1 to 73.4[emsp14][deg]F (17.9 to 23 [deg]C), dissolved oxygen concentrations from 5.6 to 8 mg L-1, and specific water conductance from 550 to 721 [micro]S cm-1.

ii. Rocky substrate with interstitial spaces. Rocks in the substrate of the salamander's surface aquatic habitat are large enough to provide salamanders with cover, shelter, and foraging

habitat (larger than 2.5 in (64 mm)). The substrate and interstitial spaces have minimal sedimentation.

iii. Aquatic invertebrates for food. The spring environment supports a diverse aquatic invertebrate community that includes crustaceans, insects, and flatworms.

iv. Subterranean aquifer. Access to the subsurface water table should exist to provide shelter, protection, and space for reproduction. This access can occur in the form of large conduits that carry water to the spring outlet or porous voids between rocks in the streambed that extend down into the water table.

Subsurface Habitat PCEs occurring within 300 meters or 984 feet of a spring outlet or cave

i. Water from the Trinity Aquifer, northern segment of the Edwards Aquifer, and local alluvial aquifers. The groundwater is similar to natural aquifer conditions. Concentrations of water quality constituents and contaminants are below levels that could exert direct lethal or sublethal effects (such as effects to reproduction, growth, development, or metabolic processes), or indirect effects (such as effects to the Jollyville Plateau salamander's prey base). Hydrologic regimes similar to the historical pattern of the specific sites are present, with continuous flow. The water chemistry is similar to natural aquifer conditions, including temperature, dissolved oxygen, and specific water conductance.

ii. Subsurface spaces. Voids between rocks underground are large enough to provide salamanders with cover, shelter, and foraging habitat. These spaces have minimal sedimentation.

iii. Aquatic invertebrates for food. The habitat supports an aquatic invertebrate community that includes crustaceans, insects, or flatworms.

Critical Habitat was not designated for the BSS. The USFWS has designated one Critical Habitat Unit (CHU) for the ABS, containing a total of 120 acres and including both a surface and subsurface component (78 Fed. Reg. 51328). The CHU is based on two PCE boundary areas projected from one or more known occupied sites within the CHU. The surface PCE boundary extends 262 feet (80 meters) in all directions from the spring outlets. This is the area within which it is presumed salamanders may travel on the surface within the spring run. The sub-surface PCE boundary extends 984 feet (300 meters) in all directions from the spring outlet. This is the area within which it is presumed that salamanders may occur in sub-surface flooded karstic refugia (cave habitat) where they are able to survive periods of drought.

Figure 1. Location of the project site and known and potential locations for listed *Eurycea* salamanders[1].

[1] USFWS Travis and Williamson County Karst Zones and Salamander Critical Habitat Viewer: http://www.arcgis.com/home/item.html?id=953ab0462a0c4f2f870c3524e5f12b8e

EFFECTS OF THE PROPOSED ACTION

Proposed project activities include alterations of the surface and, to a minimized extent, subsurface environment of the project area. Direct mortality of salamanders could occur from construction activities within occupied spring runs or stream channels connected to occupied spring runs. Similarly direct mortality of salamanders could occur from falling rocks, ceiling collapse, or other similar events if a previously undiscovered karst void containing listed salamanders is encountered during construction activities. The degradation of groundwater quality due to roadway contaminants or increased sediments in runoff from the project entering recharge features may cause indirect hydrological impacts to the aquifer and potentially to *Eurycea* in downstream locations. Impacts to the aquifer could occur during the construction of the proposed improvements or due to accidental spills relating to vehicle collisions during normal use of the facility following project completion. Impacts to the BSS or ABS could occur if there is a subsurface groundwater flow path from the project to an occupied site. Below, we explore the degree to which such effects are actually likely in the context of the project area activities and the best available information on the occurrence of BSS and ABS individuals and potential habitats.

Karst terrain feature survey results demonstrate that no spring habitat occurs within or adjacent to the project area. Caves are known to occur within the project right of way and on the adjacent City of Austin Water Quality Protection lands. The ABS has never been observed in a cave. The only cave population potentially known for the BSS occurs within a water passage at the bottom of Blowing Sink Cave more than 200 feet below the surface. The only cave close to the project area known to contain potential habitat for *Eurycea* sp. is Flint Ridge Cave (FRC) which also contains a water passage at its base approximately 150 feet below the surface. FRC has been biologically surveyed many times since its discovery in the 1970s. *Eurycea* salamanders have never been detected there. A spring also occurs downstream of the project area on Bear Creek on the Marbridge property. It is not known to contain *Eurycea* salamanders, however. The potential for occurrence of listed species in the project area is likely very low.

Although the project is being engineered in such a way as to minimize the need for excavation activities to the extent practicable, the potential remains for a cave or other karst feature to be discovered during the construction phase. Any activity that breaches the architecture of a cave system has the potential to interrupt the relative stasis of temperature and humidity required by the resident fauna. Most threats described below alter the stable physical environment of the cave, alter nutrient input, or introduce substances and/or organisms that have the potential to adversely affect the aquifer and/or *Eurycea* sp. in the cave or in downstream locations.

- Caves can be filled-in or collapse during development activities introducing sediment into the aquifer. Altering cave passages can alter the physical cave environment, as well as impede or eliminate nutrient input.

- Chemical contamination of ground water and/or surface drainages from pesticides, fertilizers, sewage, trash dumping, hazardous materials spills, pipeline leaks, fuel leaks, and urban run-off, could adversely affect the aquifer if recharge features are impacted.

- Altering surface drainage via alterations in topography, impervious cover, etc. could lead to drying of karst features and changes in nutrient inputs.

- Materials excavation operations have the potential to alter the stable physical environment of the cave ecosystem by increasing the number of cave entrances, which could have a drying effect, increase sedimentation, and change water drainage patterns to the system. Furthermore, caves can be completely destroyed through this type of activity.

A review of the Texas Water Development Board Water Information Integration and Dissemination database[2] indicates that the depth to groundwater in the project area is generally more than 100 feet (ranging between 135 and 190 feet below the land surface)—significantly reducing the likelihood that salamanders would be impacted following discovery of a cave during construction.

As detailed in the Biological Evaluation and other technical reports associated with the Environmental Impact Statement, the proposed project will incorporate state-of-the-art water quality Best Management Practices (BMPs) intended to avoid and minimize impacts to water quality and the Edwards aquifer. The water quality performance standard would exceed the threshold for avoiding water quality impacts to *Eurycea* spp. that has been previously recognized by the USFWS.

In 2007, the Texas Commission on Environmental Quality (TCEQ) and the USFWS, through a concurrence letter,[3] adopted a set of voluntary Optional Enhanced Measures (OEMs) for avoiding water quality-related impacts to five listed aquatic species: the fountain darter (*Etheostoma fonticola*), the San Marcos gambusia (*Gambusia georgei*), the Barton Springs salamander, the San Marcos salamander (*E. nana*), and the Georgetown salamander. Given the similarities between these species and the Austin Blind Salamander, we assume the measures are effective in avoiding impact to this species as well. The OEMs prescribe a broad menu of options to enhance water quality. The measures are divided into five categories starting with careful site planning where sensitive features such as caves, sinkholes, and springs are identified and planned around to the extent practicable. Temporary BMPs are employed during the construction phase to avoid and minimize disturbance of natural buffer areas and to reduce the generation and transportation of sediment and other contaminants. During and after the construction phase, permanent BMPs are employed to attain the water quality performance standard based on removal of at least 80 percent of Total Suspended Solids in stormwater from the total site area. After construction, additional BMPs are employed to avoid and minimize changes to stream morphology by controlling the rate and intensity of stormwater discharge. Finally the measures include enhanced maintenance requirements of BMPs to ensure that they continue to function according to performance standards over time.

According to the agreement, projects that adopt the OEMs into their plans do not need to consult with the USFWS regarding ESA compliance related to covered species, unless the project is located within 1 mile of Barton Springs. When implemented, the USFWS agrees that the project will not result in take of covered species through water quality impacts. The OEMs were designed primarily for non-linear projects such as subdivisions and commercial developments. As a result, it can be more difficult to apply the OEMs to linear projects such as highways where easement or right of way widths may be limited. Space is not a significant constraint for the proposed project, however, and the proposed use of BMPs in series will result in water quality protections attaining a much higher standard than those called for in the OEMs (generally more than 90% removal of Total Suspended Solids or TSS on the recharge zone). Proposed BMPs for the project will attain higher standards than those included in the OEMs across the board. The proposed project is located more than 1 mile from any spring known to be occupied by the covered species.

TAKE AND ADVERSE MODIFICATION OF CRITICAL HABITAT

Section 9 of the ESA prohibits the take of federally listed threatened and endangered species. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to

---

[2] http://wiid.twdb.texas.gov/

[3] http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/usfw_sep_4_2007_to_tceq_a.pdf
http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/usfw_sep_4_2007_to_governor_a.pdf

engage in any such conduct." The USFWS has indicated that any activity that degrades the quality or quantity of water passing through salamander habitat may result in take through habitat modification (USFWS 2013). The concept of "take" should not be confused with "affect," however. Small changes in water quality and quantity may not result in degradation of habitat conditions and would not therefore rise to the level of take as defined under the Endangered Species Act (ESA).

ESA Section 7(a)(2) prohibits the "destruction of adverse modification" of designated critical habitat by any action authorized, funded, or carried out by a federal agency. These regulations define "destruction or adverse modification" as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species." Given the assumptions associated with the project area, there will be no adverse modification of critical habitat resulting from this project. Also, as a non-Federal project, the proposed project is not subject to the adverse modification prohibition.

CONCLUSIONS

Neither the BSS nor the ABS are known to occur within or adjacent to the project area and site-specific geologic investigations suggest that any potential habitat beneath the site occurs a significant depth due to the position of the water table. The potential for direct and indirect effects to listed salamanders seems therefore to be very low. Water quality commitments for the proposed project would maintain the quality of discharged stormwater at levels above those previously recognized by the USFWS as the threshold for take. Table 1 presents the spatial and hydrogeological relationships between known and potential listed resources in the project area.

Table 1. Potential for Impacts to Listed Resources

Site	Down Gradient?	Proximity	Mitigating Factors
Barton Springs BSS, ABS, ABS CHU 1	Yes	9.2 miles	Water Quality Controls Superior to OEMs Distance / Dilution
Cold Spring BSS*	No	9.9 miles	Water Quality Controls Superior to OEMs Dye tracing indicates site not down gradient of project
Blowing Sink Cave BSS*	Yes	2.2 miles	Water Quality Controls Superior to OEMs Distance / Dilution
Spillar Ranch Spring BSS*	No	1.8 miles	Dye tracing studies and topography indicate that site is up gradient from project

REFERENCES

Barton Springs/Edwards Aquifer Conservation District (BS/EACD). 2003. *Summary of Groundwater Dye Tracing Studies (1996–2002), The Barton Springs Segment of the Edwards Aquifer, Texas*. 6 pp.

Chippindale, P.T. 2014. Final report: *Status of newly discovered cave and spring salamanders (Eurycea) in southern Travis and northern Hays Counties*. Revised February 2014. Submitted to the Texas Parks and Wildlife Department. Department of Biology, University of Texas at Arlington Life Science Building, 501 S. Nedderman Drive, Arlington, Texas 76019.

Hauwert, Nico M. 2009. *Groundwater Flow and Recharge within the Barton Springs Segment of the Edwards Aquifer, Southern Travis County and Northern Hays Counties, Texas*: Ph.D. Diss., University of Texas at Austin, Texas. 328 p.

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State Highway 45SW: 2014 Golden-cheeked Warbler Technical Report

Prepared for

Texas Department of Transportation

Prepared by

SWCA Environmental Consultants

January 2015

SWCA Project Number 27070-AUS

STATE HIGHWAY 45SW: 2014 GOLDEN-CHEEKED WARBLER TECHNICAL REPORT

Prepared for

TEXAS DEPARTMENT OF TRANSPORTATION
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Austin, Texas 78701

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SWCA Project Number 27070-AUS

January 9, 2015

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1.0 INTRODUCTION

SWCA Environmental Consultants (SWCA) was retained by the Texas Department of Transportation (TxDOT) to provide its professional opinion on the effect that construction and operation of State Highway 45SW (SH 45SW) could have on the federally listed endangered golden-cheeked warbler (*Setophaga chrysoparia*). TxDOT, in conjunction with the Central Texas Regional Mobility Authority, proposes to construct SH 45SW (a new location facility), extending for approximately 3.5 miles from the southern terminus of State Loop 1 (MoPac) to Farm-to-Market Road (FM) 1626 in southern Travis and northern Hays counties (Figure 1). The facility is proposed as a four-lane, divided toll road with 12-foot-wide lanes constructed within a right-of-way (ROW) that ranges from approximately 425 to 575 feet in width. A shared-use path would parallel the entire length of the roadway. The project area is approximately 309.1 acres, which includes existing ROW associated with MoPac, SH 45, and FM 1626, and currently undeveloped ROW owned by TxDOT that lies between MoPac and FM 1626.

The golden-cheeked warbler is a migratory songbird with a breeding range restricted to the Hill Country of central and north-central Texas. In Travis and Hays counties, the Hill Country is coincident with the Edwards Plateau, a broad platform composed primarily of Lower Cretaceous hard carbonate formations. The Edwards Plateau has a distinct eastern boundary formed by a system of geologic faults known as the Balcones Fault Zone (Spearing 1991). Lands to the east of the Balcones Fault Zone are lower in elevation and underlain by Upper Cretaceous formations consisting mostly of softer chalks, clays, and marls. Marked differences in geology cause lands on opposite sides of the fault zone to have different soils (shallow and rocky to the west, deep and clayey to the east) and, consequently, to support dissimilar vegetation communities (Griffith et al. 2007). Many plant and animal species that occur in Travis and Hays counties, including the golden-cheeked warbler, are restricted in occurrence to the Edwards Plateau. The SH 45SW ROW runs through the Balcones Fault Zone; thus, the ROW is located at the very eastern edge of the breeding range of the golden-cheeked warbler.

The ROW for SH 45SW crosses Bear Creek approximately 1.6 miles south of the southern terminus of MoPac and crosses Bliss Spillar Road approximately 0.7 mile before reaching FM 1626. A transmission line owned by the Lower Colorado River Authority (LCRA) follows the SH 45SW ROW from MoPac south to Bliss Spillar Road, and continues along the ROW from Bliss Spillar Road to about halfway to FM 1626 at which point the line diverges to end at a substation located off FM 1626 to the east of the proposed SH 45SW/FM 1626 intersection. The transmission line runs directly adjacent to the east side of the SH 45SW ROW except for an approximately 3,100-foot segment to the north of Bear Creek that was diverted to the west side of the ROW. The LCRA transmission line easement was cleared of trees along most of its length to a width ranging from approximately 50 to 100 feet.

Excluding the LCRA transmission line easement, much of the land on either side of the SH 45SW ROW to the north of Bear Creek, and all land to the east of the ROW between Bear Creek and Bliss Spillar Road, is owned by the City of Austin. This land is divided into several parcels collectively referred to as Water Quality Protection Lands. Privately held land is present along both sides of the SH 45SW ROW to the south of Bliss Spillar Road, to the west of the ROW between Bliss Spillar Road and Bear Creek, and along some of both sides of the ROW north of Bear Creek.

Water Quality Protection Lands owned by the City of Austin adjacent to the SH 45SW ROW are largely undeveloped. Privately held lands on either side of the SH 45SW ROW contain a combination of woodland, rangeland, and residential development. A residential subdivision known as Avana is currently under construction to the west of the SH 45SW ROW immediately south of MoPac.

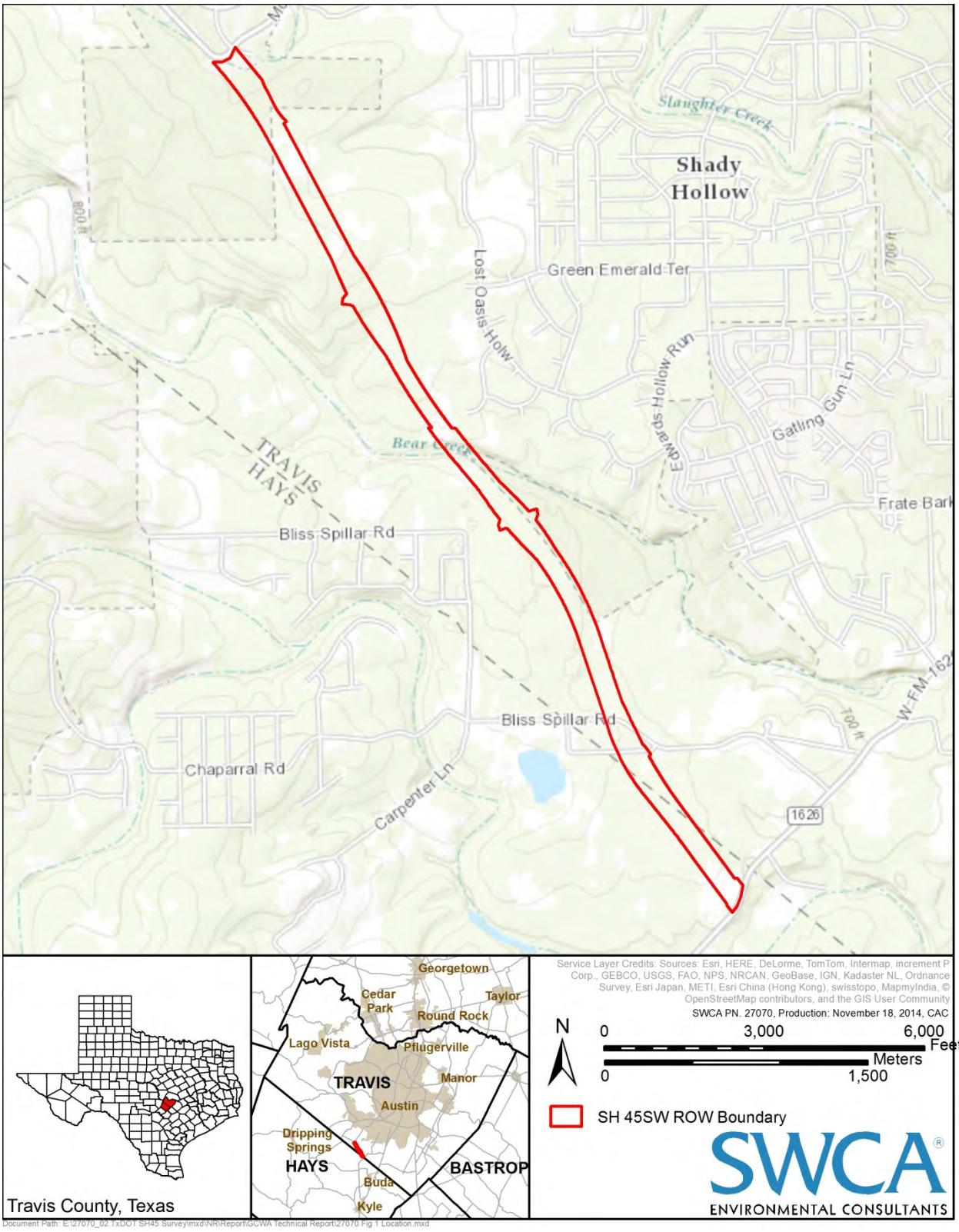

Figure 1. SH 45SW location map.

SWCA performed a survey for the golden-cheeked warbler in the SH 45SW ROW in the spring of 2014. To our knowledge, this is the only survey for the warbler that has been conducted along the length of the ROW. Knowledge of the status of the golden-cheeked warbler in the SH 45SW ROW has been informed through surveys that have been performed on adjacent lands on behalf of the City of Austin periodically since 2000, and by a survey conducted for LCRA in 2007. These surveys are discussed in greater detail in Section 3.3.1.

2.0 BACKGROUND INFORMATION

2.1 Endangered Species Act

The stated purposes of the Endangered Species Act (ESA) are to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section" (16 USC 1531(b)).

Section 9(a) of the ESA prohibits the *take* of any federally listed endangered wildlife species (16 USC 1538(a)). The ESA defines *take* as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532(19)). *Harm* and *harass* are not defined in the statute, but U.S. Fish and Wildlife Service (USFWS) regulations define *harm* as "an act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering." *Harass* is defined by the USFWS as an "intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding and sheltering" (50 CFR 17.3 [2005]). With regard to the golden-cheeked warbler, it is our experience that the USFWS will consider modification of regularly occupied habitat to constitute *take* through the harm definition and, therefore, be a violation of the ESA, depending on the magnitude and severity of the modification.

Under section 10(a)(1)(B) of the ESA (16 USC 1539(a)(1)(B)), the USFWS can issue permits to authorize take of listed species that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." The USFWS has issued such a permit to the City of Austin and Travis County, with this permit authorizing the implementation by these entities of the Balcones Canyonlands Conservation Plan (BCCP). The BCCP is a regional habitat conservation plan that (subject to certain limitations) allows non-federal entities to gain ESA authorization for projects occurring in Travis County through purchase of Participation Certificates from the BCCP, with the City of Austin and Travis County committing to preserve and manage a specified amount of endangered species habitat (with assistance from their managing partner, the LCRA, as well as cooperation from The Nature Conservancy and Travis Audubon Society) in exchange for the ability to provide stream-lined ESA permitting for their constituents, along with other benefits associated with the conservation of greenspace.

2.2 Golden-cheeked Warbler

The golden-cheeked warbler was listed as endangered in 1990 because of imminent and continuous destruction of breeding habitat. The breeding range of the golden-cheeked warbler is restricted to the State of Texas, where it occurs primarily in the Edwards Plateau and Cross Timbers regions of central and north-central Texas. Most warblers arrive on their breeding grounds in early to mid-March and generally begin their migration southward in July or early August. The species winters in the highlands of southern

Mexico and northern Central America (USFWS 1992). Research by Rappole et al. (1999, 2000) indicates that golden-cheeked warblers on their wintering grounds prefer oak or oak/pine woodlands occurring at elevations between approximately 3,600 to 7,900 feet above mean sea level.

Breeding habitat for the warbler is not homogenous at a regional or even local scale, but in general consists of woodland that has a closed or nearly closed canopy and is composed of a mixture of mature Ashe juniper (*Juniperus ashei*) and broad-leafed hardwood trees, especially oaks such as Texas oak (*Quercus buckleyi*) and plateau live oak (*Q. fusiformis*). Depending on geographic locale, other hardwood tree species found in golden-cheeked warbler breeding habitat can include shin oak (*Q. sinuata*), Lacey oak (*Q. glaucoides*), post oak (*Q. stellata*), blackjack oak (*Q. marilandica*), escarpment black cherry (*Prunus serotina* var. *eximia*), Arizona black walnut (*Juglans major*), Texas ash (*Fraxinus texensis*), and cedar elm (*Ulmus crassifolia*), among others. The USFWS has not designated critical habitat for the golden-cheeked warbler.

The USFWS has provided guidance that indicates the Texas Parks and Wildlife Department (TPWD) description of golden-cheeked warbler habitat as provided in Campbell (2003) should be used when determining whether or not a particular patch of woodland has potential to support golden-cheeked warblers. The TPWD golden-cheeked warbler habitat description is divided into two categories: 1) types of habitat where warblers are expected to occur; and 2) types of habitat that may be used by warblers. These habitat descriptions are summarized in Table 1.

Table 1. Description of Golden-cheeked Warbler Habitat (Adapted from Campbell [2003])

Potential for Occurrence	Site Characteristics			
	Requisite Elements	Topography	Woodland Composition	Canopy Closure
High	Mature Ashe juniper and other trees ≥ 15' tall Diameter of Ashe juniper trunks at breast height ≥ 5"	Canyons, slopes, and associated creek bottoms	Ashe juniper, Texas oak, live oak, Lacey oak, chinkapin oak (*Q. muhlenbergii*), cedar elm, escarpment black cherry, Texas ash, bigtooth maple (*Acer grandidentata*), redbud (*Cercis canadensis*), hackberry (*Celtis* spp.), pecan (*Carya illinoinensis*), and other deciduous trees	50 – 100 %
		Flat to rolling uplands	Live oak, blackjack oak, post oak, shin oak, Lacey oak, Texas oak, cedar elm, hackberry, Texas madrone (*Arbutus texana*), and Ashe juniper	
Possible		Flat to rolling uplands	Mature live oak, blackjack oak, post oak, and Ashe juniper	35 – 50 %
			Mature live oak, Ashe juniper, hackberry, cedar elm, and mesquite (*Prosopis glandulosa*).	

The TPWD put forth this description of golden-cheeked warbler habitat largely to assist the general public in determining whether or not they may have warbler habitat on their properties so that those people would be able to perform typical agricultural land management practices without likelihood of adversely affecting the species (Campbell 2003). It is important to note that the TPWD description only allows a decision as to whether or not a patch of woodland has potential to provide habitat to golden-cheeked warblers. Labeling a patch of woodland as potential warbler habitat does not ordain that woodland as habitat; the species has to occur in and utilize the woodland in order for it to provide habitat to the species. Surveys are necessary to determine conclusively whether or not golden-cheeked warblers actually occur in patches of woodland that meet the TPWD description of potential habitat, or that are identified as potential warbler habitat using any other habitat assessment methodology.

The greatest threat to the continued existence of the golden-cheeked warbler is habitat loss resulting from urbanization and clearing associated with agricultural practices (USFWS 1992). At the time of its listing

as endangered, human agricultural activities during the mid-twentieth century had eliminated a considerable amount of golden-cheeked warbler habitat within the range of the species. The USFWS (1992) estimated the male warbler population as of 1990 to be approximately 13,800 based largely on the work of Wahl et al. (1990). This estimate was based on availability of suitable habitat as assessed through examination of satellite imagery taken in the 1970s and early 1980s (Wahl et al. 1990).

Habitat loss has continued since the warbler was listed as endangered as suburban developments have spread into golden-cheeked warbler habitat along the Balcones Escarpment, especially in a growth corridor from Williamson County to Bexar County. At the same time, woodland cover has increased in many rural areas on the Edwards Plateau since the mid-twentieth century because of changes in land use practices. As an example, the number of goats clipped annually for mohair in Texas, an industry centered on the Edwards Plateau, dropped from an average of more than 4,000,000 in the early 1960s to approximately 1,500,000 in the 1970s. This number held fairly steady through the 1980s and early 1990s, but then dropped again once a federal subsidy on mohair production ended in 1994. The number of goats clipped annually for mohair in Texas averaged approximately 300,000 in the early 2000s, and approximately 95,000 over the last five years (U.S. Department of Agriculture 2014). Decreases such as these appear to have enabled woodland to develop on many lands that were formerly kept cleared of trees and brush to promote livestock grazing, seemingly to the benefit of the golden-cheeked warbler.

Because habitat loss is considered the most important threat to the golden-cheeked warbler, quantifying the amount of breeding habitat available to the species has garnered special attention. Through interpretation of 2001 satellite imagery, Loomis-Austin, Inc. (2008) estimated that approximately 4,149,478 acres of golden-cheeked warbler habitat were present across the breeding range of the species when the imagery was taken. Diamond (2007) using that same 2001 imagery estimated that approximately 4,378,400 acres of warbler habitat were present rangewide at that time. Morrison et al. (2010) performed their own mapping of the distribution of golden-cheeked warbler habitat through assessment of 2007 and 2008 Landsat 5 imagery and ground-truthing at 1,000 points spread randomly across the range of the warbler. This mapping resulted in the identification of approximately 4,148,138 acres of potential golden-cheeked warbler habitat across the range of the species. As 6 to 13 years have passed since the imagery used to develop these models was taken, it can be expected that habitat conditions likely now differ somewhat in certain locations from those represented by the models as a result of additional real estate development, industrial activities, agricultural clearing, and natural woodland succession.

Duarte et al. (2013) sought to investigate the change in amount of golden-cheeked warbler habitat present on the landscape between the periods of 1999–2001 and 2010–2011. The authors used satellite imagery from 1999–2001 and 2010–2011 to model the amount of evergreen/mixed woodland and adjacent deciduous woodland present on the landscape during each time period and defined that woodland as golden-cheeked warbler habitat if it occurred in patches at least 37 acres in size. Duarte et al. (2013) did not include field-testing to verify the accuracy of their habitat model. Based on the difference in the amount of woodland cover present on the landscape in 1999–2001 and 2010–2011, the researchers concluded that the warbler lost 29% of its habitat over the decade of study. We cannot accept the findings of this study for the reasons outlined below.

The Duarte et al. model identified approximately 1.1 to 1.3 million acres (25% to 32%) more golden-cheeked warbler habitat on the landscape in 1999–2001 than did the Loomis-Austin, Inc. (2008) or Diamond (2007) models that relied on satellite imagery from the same time period. This causes us to seriously question the accuracy of the Duarte et al. habitat model because Morrison et al. (2010) found

that the Loomis-Austin, Inc. and Diamond models had very low rates of omission, meaning that very little true golden-cheeked warbler habitat was missed being mapped as such by either model.[1]

In quantifying the amount of golden-cheeked warbler habitat present in 2010–2011, Duarte et al. (2013) discounted all habitat identified by their model as having developed on the landscape since 1999–2001 with the rationale that golden-cheeked warbler habitat could not have developed over such a short span of time. We strongly disagree with that decision. It is true that warbler habitat cannot develop over a decade if the starting point is grassland, but warbler habitat most certainly can form over 10 years if starting with oak/juniper woodland that only lacks sufficiently mature Ashe juniper trees or has slightly too open of a canopy layer.

Duarte et al. (2013) did not identify the amount of habitat identified by their model as having formed during the decade of study so it cannot be determined how its inclusion would have altered the reported percent decrease in golden-cheeked warbler habitat acreage. Despite the seemingly dramatic 29% reduction in golden-cheeked warbler habitat over the examined period and the discounting of woodland that may have gained suitability as golden-cheeked warbler habitat over the past decade, Duarte et al. (2013) still identified a robust 3,900,002 acres of golden-cheeked warbler habitat as being present on the landscape in 2010–2011.

As part of their study, Morrison et al. (2010) conducted field surveys in the spring of 2009 to determine rates of warbler occupancy in the potential habitat mapped by their model. Morrison et al. (2010) found that rates of golden-cheeked warbler occupancy increased as patch size increased, and that density of warbler occupation generally increased across the breeding range from north to south. Based on the results of the field surveys, Morrison et al. (2010) estimated the 2009 population of singing male golden-cheeked warblers to be approximately 220,615. This study was refined by the same general group of authors for publication in peer-reviewed scientific literature, leading them to increase their 2009 male golden-cheeked warbler population estimate to approximately 263,339 (Mathewson et al. 2012).

SWCA is aware that not all students of the golden-cheeked warbler accept the population estimate put forth by Morrison et al. (2010) and Mathewson et al. (2012) as likely to be accurate, and some have pointed out examples of specific patches of woodland where known warbler numbers are lower, and in some cases much lower, than the numbers predicted to be there by the Morrison et al. (2010) model. Because Morrison et al. (2010) evaluated the warbler population at a regional scale and relied on averages, these examples should be expected to be balanced out by warblers occurring in some other patches of habitat in numbers greater than those predicted by the model.

SWCA too is aware of patches of woodland that do not support golden-cheeked warblers in the numbers seemingly predicted by the Morrison et al. (2010) model and, interestingly, they are all situated at the eastern edge of the Edwards Plateau at the very edge of the breeding range of the species. However, SWCA has also found the golden-cheeked warbler to be a reasonably common (often surprisingly common to people that know the bird only through its status as an endangered species) and widespread resident of woodlands on the Edwards Plateau. Comparison of recent aerial photography against historical aerial photography (e.g., such as that contained in soil surveys of Texas counties produced by the Soil Conservation Service of the U.S. Department of Agriculture, mostly in the late 1970s and early 1980s) and the mapping of golden-cheeked warbler habitat independently performed by Duarte et al. (2013), Morrison et al. (2010), Loomis-Austin, Inc. (2008), and Diamond (2007), all indicate that a considerably

[1] In essence, *all* juniper- and oak-bearing woodland of appropriate patch size present on the landscape in the range of the golden-cheeked warbler was identified as golden-cheeked warbler habitat by the Loomis-Austin, Inc. and Diamond models, so for all practical purposes the models could not miss properly classifying any woodland that truly was habitat. The flip side of this catchall approach is that, as a result, each model also improperly identified a considerable amount of non-habitat woodland as golden-cheeked warbler habitat (Morrison et al. 2010).

greater amount of potentially suitable warbler habitat is present on the landscape now than was present on the landscape in the 1970s and 1980s when examined by Wahl et al. (1990).

SWCA believes the results of the field surveys performed by Morrison et al. (2010) that enabled them to reach their population estimate indicate strongly that the golden-cheeked warbler population has been able to expand to take advantage of increased habitat availability. If the results of their surveys across the range of the species had largely been negative, the survey results would not have led to a population estimate of 220,615 to 263,339 male warblers. Consequently, while the Morrison et al. (2010) population model does not hold up on a property-by-property basis (and was not intended to do so), SWCA would venture to guess that the current golden-cheeked warbler population is closer to the number identified by Morrison et al. (2010) than it is to the number identified by the USFWS more than 20 years ago in the Golden-cheeked Warbler Recovery Plan that was based on satellite imagery that is now 30 to 40 years old (USFWS 1992, Wahl et al. 1990).

The clearing of warbler habitat from a particular stand of woodland is often incomplete, and many people have studied the effect that such habitat fragmentation can have on local golden-cheeked warbler populations. Habitat fragmentation leads to reduced habitat patch sizes and creation of habitat edges (boundaries between habitat types), and may lead to deleterious isolation of habitat patches. Studies on the effects of habitat fragmentation have shown that golden-cheeked warbler occupancy and productivity are significantly lower in small patches of habitat than in larger ones (Maas-Barleigh 1997, Coldren 1998). During their 2009 surveys of potential habitat, Morrison et al. (2010) detected golden-cheeked warblers in 4 of 33 (12.1%) surveyed patches of woodland that were less than 24.7 acres in size. Occupancy rates were found by Morrison et al. (2010) to be 37.6% in patches that ranged from 24.7 to 123.5 acres, 67.7% for patches ranging from 247 to 1,235 acres, and 93.3% for patches in excess of 2,470 acres. Butcher et al. (2010) found evidence to suggest that no more than one pair of golden-cheeked warblers would occur in a patch of woodland less than 37 acres in size.

Populations of golden-cheeked warblers appear to be less stable in small habitat patches surrounded by development (Coldren 1998, Engels 1995, Arnold et al. 1996, Moses 1996). Some studies indicate that the abundance of the golden-cheeked warbler is reduced within 656 to 1,640 feet of an urban edge (Engels 1995, Arnold et al. 1996, Coldren 1998). Coldren (1998) reported that warbler occupancy declined with increasing residential development and roadway width. Peak (2007) showed that golden-cheeked warblers experience decreased nesting success and increased predation rates closer to the edges of woodland than they do within the interior of woodlands.

Some researchers have studied how small a patch of habitat can be and still be used by golden-cheeked warblers. The study of minimum patch size requirements by the warbler is complicated because, as suggested by the studies identified above, the size of a patch of woodland needed to support golden-cheeked warblers varies depending on surrounding land uses, distance to the next nearest patch of habitat, and the size of that next nearest patch. Further, the mapping of discrete patches of habitat may be inappropriate if those patches, while able to be mapped by a cartographer as discrete units, are spaced so closely together that a warbler does not recognize them as separate patches. Magness et al. (2006) developed a method for predicting presence or absence of golden-cheeked warblers in a given patch of woodland based on the total amount of woodland present on the landscape regardless of how it was configured into patches. They found that golden-cheeked warblers occurred in a patch of woodland only when landscape composition within a 1,312-foot (400-m) radius of the patch exceeded 40% woodland, and that the likelihood of occupancy was greater than 50% only when landscape composition exceeded 80% woodland.

Woodland was defined by Magness et al. (2006) as a vegetative community with at least 30% tree cover. While they could not rule out a relationship between habitat fragmentation and overall habitat quality as measured by nesting success and recruitment, Magness et al. (2006) did conclude that common measures

of habitat fragmentation, including edge density, mean-nearest neighbor, and distance between woodland patches, were poor predictors of species occurrence across all spatial scales.

We believe the findings of Magness et al. (2006) are important as they suggest that woodland-clearing activities performed outside the boundaries of golden-cheeked warbler habitat can exert influence on the long-term ability of nearby habitat to support warblers. For example, the findings of Coldren (1998), Arnold et al. (1996), and Engels (1995) with regard to effects of urban edges on habitat usage by golden-cheeked warblers may have had nothing to do with urban land uses per se. It could simply be that development of land caused the amount of woodland present on the local landscape to drop below the 40% threshold in habitat occurring in proximity to the development, thereby rendering it unattractive to golden-cheeked warblers. SWCA finds such a scenario to be highly plausible because it fits the real-world observations of golden-cheeked warblers we have made through the years.

SWCA has observed golden-cheeked warblers in trees in residential yards, in specimen trees preserved in commercial lots and on school properties, singing adjacent to roads while perched on telephone wires, singing from trees adjacent to active home construction sites, crossing golf course fairways, crossing roads, and even singing from trees within the median of an interstate highway (SWCA 2012). Nothing SWCA has observed in the field suggests golden-cheeked warblers shy away from anthropogenic features where such features occur within a predominantly wooded landscape.

In contrast to our observations of golden-cheeked warblers juxtaposed with human development, the USFWS has traditionally considered the noise and activity associated with construction projects as having potential to disturb golden-cheeked warblers and potentially cause violations of the ESA through the Section 9 prohibitions on harassment and harm. Golden-cheeked warblers are known to occur regularly and in relatively high numbers on two active military reservations, Fort Hood in Bell and Coryell counties, and Camp Bullis in Bexar County, and they also occur regularly in a number of highly visited state parks. Persistent occurrence of golden-cheeked warbler in these areas, as well as our own observations of warblers as described above suggest strongly to us that golden-cheeked warblers habituate to human activity and sources of anthropogenic noise.

This position is supported by a recent three-year study on the effects of road construction activity and noise on golden-cheeked warblers (Lackey et al. 2011). This study examined warbler behavior and productivity in habitat subjected to traffic noise, habitat subjected to traffic and construction noise, and, as quiet control sites, in habitat remotely situated from traffic and construction noise. Results of the study indicate that "construction activity and road-noise did not appear to impact territory placement, reproductive success, or local densities of golden-cheeked warblers" (Lackey et al. 2011). The Lackey et al. study was performed on a highway in counties (Real and Uvalde) where traffic loads are comparatively light.

However, similar findings are being found in Travis County in another on-going study of the effects of road and construction noise on golden-cheeked warblers along a very heavily traveled roadway (State Highway 71). This study was initiated in 2008. It included collection of data during the pre-construction phase and is now in the construction and post-construction data collection phase at sites subjected to road noise only, sites subjected to road and construction noise, and quiet control sites. To date, the study has found that introduction of road-construction noise has had no effect on pairing success, territory placement, or warbler productivity (Pruett et al. 2014).

2.2.1 Golden-cheeked Warbler Survey Protocols

The USFWS has established protocols for conducting presence/absence surveys for the golden-cheeked warbler. These protocols are designed by the USFWS to be of sufficient intensity to allow the agency to accept equating failure to detect birds with true absence of the species from the surveyed area.

Current presence/absence survey protocols for the golden-cheeked warbler require survey visits to be conducted between 15 March and 1 June. Protocols in place from 2003 to 2009 required visits to be performed between 15 March and 15 May, while prior to 2003 it was required to perform survey visits between 20 March and 15 May. In all years relevant to SH 45SW, the USFWS protocols have required a minimum of 20 hours of survey time be expended for every 100 acres surveyed and a minimum of five site visits with no more than one survey visit every five days.

Prior to 2010, USFWS protocols required that presence/absence surveys be completed by noon. From 2010 onward, the protocols have allowed daily surveys to conclude within seven hours of sunrise, which for most of the survey season is after 1:00 p.m. and sometimes closer to 2:00 p.m. In all years, the USFWS protocols have stipulated that no recordings of golden-cheeked warbler songs be played during the five visits, but, if no warblers are detected during those five visits, that warbler song recordings then be played in an effort to elicit responses from any previously undetected warblers.

3.0 SH 45SW RIGHT-OF-WAY BASELINE CONDITIONS

3.1 Topography, Geology, and Soils

Lands crossed by the SH 45SW ROW are all relatively flat to very gently rolling, except where the ROW crosses Bear Creek. Bear Creek has incised the relatively flat landscape, resulting in the presence of a moderate to steep but fairly low slope leading down to the creek from the north, and a moderate to moderately gentle and low slope leading down to it from the south. Bear Creek is a rocky, ephemeral channel where crossed by the SH 45SW ROW.

Surface geology within the SH 45SW ROW consists of the Lower Cretaceous Edwards Formation from its north end at MoPac south to a point approximately 0.7 mile south of Bear Creek (Bureau of Economic Geology 1981). From south of this point to FM 1626, the ROW is underlain by Quaternary fluviatile terrace deposits. The Edwards Formation consists of layers of limestone and dolomite, some of which are prone to dissolution by meteoric water. Fluviatile terrace deposits consist of alluvial materials such as gravel, sand, silt, and clay that were laid down in sheets by rivers.

The point where the SH 45SW ROW leaves the outcrop of the Edwards Formation and crosses onto land underlain by the Quaternary fluviatile terrace deposits begins the local eastward transition off of the Edwards Plateau. Soils throughout the SH 45SW ROW are mapped within the Speck-Tarrant association (Soil Conservation Service 1974). Soils contained within this association are typically shallow to very shallow, stony loams and clays formed over limestone (Soil Conservation Service 1974).

3.2 Vegetation

Vegetation within and adjacent to the SH 45SW ROW consists of a combination of open rangeland and woodland with varying degrees of canopy closure. The southern-most mile of the ROW crosses through a landscape that overall is much more open than that to the north, with this open landscape reflecting the distribution of exposure of the fluviatile terrace deposits. These loose alluvial deposits form deeper soils that are more suited to agricultural uses than the shallow, rocky soils formed over the Edwards Formation. In general, lands crossed by the SH 45SW ROW where underlain by the Edwards Formation support semi-open to closed woodland composed primarily of Ashe juniper and plateau live oak trees, along with some light scrub. Where underlain by the fluviatile terrace deposits, lands crossed by the SH 45SW ROW consist of pastures and open, sometimes scrubby, woodlands.

The west end of a patch of relatively dense woodland is present at the north end of the SH 45SW ROW. This woodland is composed primarily of mature Ashe juniper trees along with scattered live oak, Texas

oak, cedar elm, and Texas sugarberry (*Celtis laevigata*) trees. The canopy of the woodland is nearly closed on the north side of the patch, where most Ashe juniper trees range from 16 to 28 feet tall and most hardwood trees range from 18 to 36 feet tall. Tree heights decrease to the south and the woodland becomes more open and drier, with hardwoods limited almost exclusively to live oak trees. Ashe juniper trees are mostly 14 to 16 feet tall on the south edge of the patch, and most live oak trees are less than 26 feet tall. Canopy closure on the south side of the patch is approximately 75%.

From the southern edge of the above-described patch of woodland south to the Bear Creek corridor, vegetation within the SH 45SW ROW consists of open to semi-open woodland mixed with prickly pear (*Opuntia* spp.) and some light scrub. Common woody species in these open and semi-open communities include Ashe juniper, mesquite, and plateau live oak trees and Texas persimmon (*Diospyros texana*), agarita (*Mahonia trifoliolata*), elbowbush (*Forestiera pubescens*), and gum elastic (*Sideroxylon lanuginosum*) shrubs. Shrubs occur throughout the area in low to very low densities. Cedar elm and post oak trees are present locally in very low densities.

The margins of the Bear Creek channel support a narrow corridor of riparian woodland. Trees present along the creek include Texas oak, sycamore (*Platanus occidentalis*), cedar elm, Texas ash, Ashe juniper, Carolina buckthorn (*Frangula caroliniana*), and pecan (*Carya illinoinensis*). Shrubs present along the creek include common hop-tree (*Ptelea trifoliata*), American beautyberry (*Callicarpa americana*), buttonbush (*Cephalanthus occidentalis*), and gum elastic. Slopes leading down to the creek support live oak/Ashe juniper woodland. Overall shrub density is low to moderate on these slopes, although shrub diversity is comparatively high. Shrub species present on the slopes include red buckeye (*Aesculus pavia*), Mexican buckeye (*Ungnadia speciosa*), fragrant sumac (*Rhus aromatica*), poison-ivy (*Toxicodendron radicans*), agarita, common hop-tree, Texas kidneywood (*Eysenhardtia texana*), shrubby boneset (*Eupatorium serotinum*), Texas persimmon, elbowbush, prickly pear, and twistleaf yucca (*Yucca rupicola*).

The first approximately 2,200 linear feet of ROW south of Bear Creek contain semi-open to relatively dense woodland composed primarily of Ashe juniper and plateau live oak trees, with low to very low densities of cedar elm and blackjack oak trees, and low densities of Texas persimmon, elbowbush, and agarita shrubs. Most Ashe junipers in this woodland range from 10 to 20 feet tall, while the hardwood trees are mostly 26 to 36 feet in height.

To the south of the above-described woodland, the ROW crosses through a grove of nearly closed canopy woodland composed of large cedar elm and live oak trees and sapling Ashe juniper. The hardwood trees are mostly 30 to 40 feet tall, while most junipers are 6 to 14 feet tall. It appears that Ashe juniper had been kept cleared from this woodland until fairly recently, perhaps up until the SH 45SW ROW was acquired by TxDOT. In addition to the Ashe juniper saplings, the understory within this grove of large trees contains low densities of Texas persimmon, elbowbush, agarita, western soapberry (*Sapindus saponaria* var. *drummondii*), and cedar elm saplings.

From the south end of the grove of large trees to Bliss Spillar Road, the SH 45SW ROW mostly contains open to semi-open woodland composed of Ashe juniper, plateau live oak, cedar elm, and mesquite trees intermixed with some small patches of denser woodland of similar species composition and some grassy open scrub composed mostly of Texas persimmon, agarita, and prickly pear.

The SH 45SW ROW crosses Old Bliss Spillar Road approximately 500 feet to the south of Bliss Spillar Road. A patch of shrubby open woodland that appears to have once been live oak savanna is present between these two roads. Large live oak trees are scattered through the area, with several of the trees appearing to now be dead, perhaps as a result of drought. Moderate densities of small mesquite and Ashe juniper trees are present between the live oak trees, along with some cedar elm and Texas sugarberry saplings.

South of Old Bliss Spillar Road, the SH 45SW ROW first crosses a pasture that has been heavily invaded by mesquite, and then crosses the west end of a patch of plateau live oak woodland. Live oak trees in this patch are mostly 30 to 40 feet tall. Ashe juniper is present only as an understory component of the woodland, where it occurs as 8- to 12-foot-tall whippy saplings. Also present in the understory of the woodland are low densities of cedar elm saplings, Texas persimmon, and elbowbush.

After crossing this patch of live oak woodland, the SH 45SW ROW crosses a former pasture that also appears to have historically been maintained as live oak savanna but now supports semi-open to relatively dense mesquite woodland mixed with low densities of Ashe juniper and dotted with large live oak trees. Beyond this former pasture the ROW crosses a pasture that is partially invaded by mesquite and dotted with a few Ashe juniper trees, and then reaches FM 1626.

3.3 Status of the Golden-cheeked Warbler

3.3.1 Field Investigations Prior to 2014

To our knowledge, no survey of the complete SH 45SW ROW had been conducted for the golden-cheeked warbler prior to the spring of 2014. However, as discussed below, woodland in some sections of the SH 45SW ROW had been surveyed for golden-cheeked warblers, either directly or indirectly, in years prior to 2014.

3.3.1.1 The North End

As described in Section 3.2 (Vegetation), the north end of the SH 45SW ROW contains the western extent of a patch of nearly closed canopy woodland composed of mature Ashe juniper trees along with lower densities of hardwood trees such as plateau live oak, Texas oak, cedar elm, and Texas sugarberry. The species composition and structure of this patch of woodland are similar to known golden-cheeked warbler habitat. The patch of woodland extends eastward from the SH 45SW ROW across a privately held parcel and into the north ends of two parcels owned by the City of Austin that it refers to as the Andrewartha and 118 Edward's Crossing properties. The full breadth of the patch also lies directly adjacent to the southern boundary of another tract owned by the City of Austin that it refers to as the J17 property. Locations of City of Austin properties relative to the SH 45SW ROW are depicted on Figure 2.

The similarity of this patch of woodland to known golden-cheeked warbler habitat has caused it to attract attention from the City of Austin and LCRA. To our knowledge, the J17 and 118 Edward's Crossing properties were first surveyed for golden-cheeked warblers on behalf of the City of Austin by Loomis-Austin, Inc. in 2000. This survey was extended across 150 acres of "potential habitat" and performed over six visits during the period of 4 April through 11 May. A total of 13.25 hours was spent conducting the survey, which was below the level of effort prescribed by USFWS presence/absence survey protocols.

No golden-cheeked warblers were detected by Loomis-Austin, Inc. in 2000 while surveying the J17 and 118 Edward's Crossing properties (Loomis-Austin, Inc. 2000a). While this survey was not extended to the woodland contained in the SH 45SW ROW, it afforded opportunities for the surveyors to detect golden-cheeked warblers in the patch of woodland from the J17 fence line. In 2000, Loomis-Austin, Inc. concluded woodland on the surveyed properties represented marginal habitat for the golden-cheeked warbler owing to low densities of deciduous trees and patchy canopy cover (Loomis-Austin, Inc. 2000a).

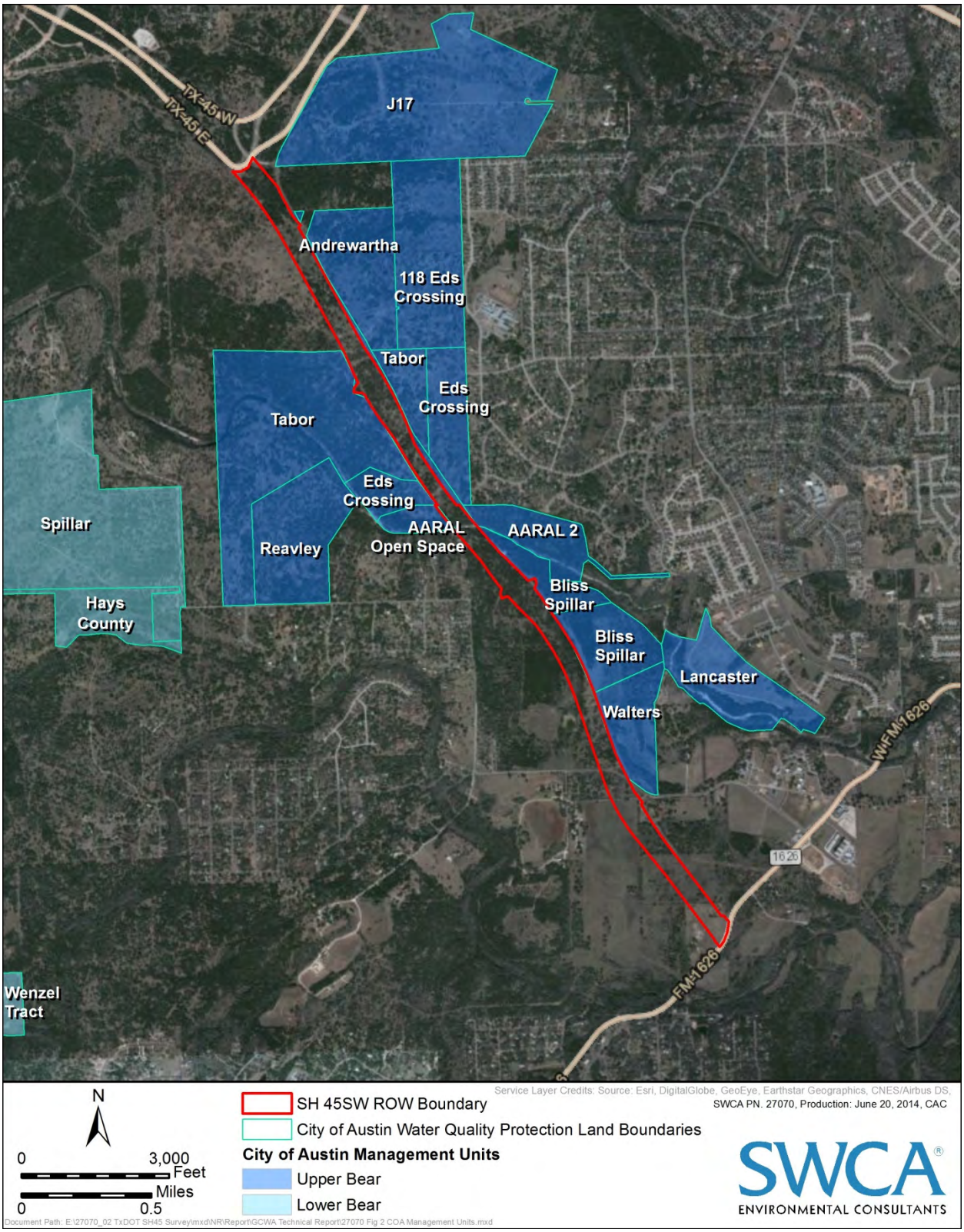

Figure 2. Location of the SH 45SW right-of-way relative to lands owned by the City of Austin.

The patch of dense woodland at the north end of the SH 45SW ROW was directly surveyed for golden-cheeked warblers by SWCA in 2007. This survey was conducted on behalf of LCRA prior to its construction of the transmission line that now runs along the margins of the SH 45SW ROW. The survey covered approximately 25.2 acres of the woodland, with the survey area centered on the transmission line easement and encompassing all of the denser woodland contained within the SH 45SW ROW. This survey was conducted in accordance with USFWS presence/absence survey protocols over visits performed on 23 and 28 March, 13 and 27 April, and on 7 May 2007. A total of 5 hours and 15 minutes was spent conducting the survey on these five days. No golden-cheeked warblers were detected in or from the survey area during those five visits. During a sixth visit on 11 May, taped recordings of golden-cheeked warbler songs were played at various points within the survey area in an effort to elicit response from any previously undetected warblers, again with negative results (SWCA 2007).

On behalf of the City of Austin, Baer Engineering and Environmental Consulting, Inc. (Baer) surveyed portions of the J17, Andrewartha, and 118 Edward's Crossing properties for the golden-cheeked warbler in 2010. Approximately 154 acres on these properties were surveyed in 2010 between 27 March and 6 May (Baer 2010). Nearly 34 hours was spent conducting the survey, exceeding the amount of time required by USFWS presence/absence survey protocols. Baer did not detect any golden-cheeked warblers in the dense patch of woodland in 2010 (Baer 2010).

In 2013, SWCA surveyed an approximately 205-acre area covering portions of the J17, 118 Edward's Crossing, and Andrewartha properties on behalf of the City of Austin (SWCA 2013). The 2013 survey area included all of the dense woodland present on the north ends of the Andrewartha and 118 Edward's Crossing properties and all land directly adjacent to the dense patch of woodland on the J17 property. A total of 41 hours was spent conducting this survey between 27 March and 24 May, exactly meeting the amount of time required by USFWS survey protocols. Again, no golden-cheeked warblers were detected in the dense patch of woodland during the 2013 survey (SWCA 2013).

Following the 2013 survey, SWCA used ArcGIS software and recent digital aerial photography to map all woodland present on the landscape within 400 meters of the dense patch of woodland that extends into the north end of the SH 45SW ROW. This analysis revealed that approximately 591.4 acres of land occur within 400 meters of this patch of woodland and that approximately 199.0 of those 591.4 acres (or 33.6%) support woodland, with remaining lands mostly containing open rangeland, residential development, and roads. The consistent absence of golden-cheeked warblers from the dense patch of woodland at the north end of the SH 45SW ROW, therefore, seems to fit with the findings of Magness et al. (2006), who concluded that at least 40% of the local landscape must be wooded in order for golden-cheeked warblers to occur in a particular location. Consequently, continued absence of golden-cheeked warblers from this patch of woodland appeared to be the expected condition, not because of site-specific vegetative characteristics, but because of broader-scale land cover factors.

3.3.1.2 The Bliss Spillar Property

As shown on Figure 2, the Bliss Spillar property is a tract owned by the City of Austin that lies directly opposite of the LCRA transmission line easement from the SH 45SW ROW to the south of Bear Creek. Another City of Austin property, the AARAL 2 property, lies directly north of the Bliss Spillar property.

The north end of the Bliss Spillar property is underlain by the Edwards Formation, while the south end is underlain by Quaternary fluviatile terrace deposits (Bureau of Economic Geology 1981). The north end of the property supports relatively dense woodland composed mostly of Ashe juniper and live oak, along with low densities of Texas oak trees. This woodland was fully contiguous with woodland contained in the SH 45SW ROW prior to clearing of the LCRA transmission line easement. The south half of the Bliss Spillar property was disturbed historically by vegetation clearing and agricultural activities. This part of the property primarily supports grassland or open to dense mesquite woodland with a grassy ground

cover. Two small linear patches of dense hardwood-juniper woodland are also present in the southern half of the property. A patch of woodland with a moderately open canopy and composed primarily of mature cedar elm and live oak trees, along with sapling Ashe juniper, is present on the east side of the Bliss Spillar property (SWCA 2013).

The Bliss Spillar property was first surveyed for the City of Austin in 2000 by Loomis-Austin, Inc. No golden-cheeked warblers were detected on the Bliss Spillar property in 2000 (K. Thuesen/City of Austin, pers. comm. to SWCA, April 2002). SWCA is not in possession of a report from Loomis-Austin, Inc. that summarizes the results of the 2000 survey, so we cannot identify the dates it was performed.

SWCA surveyed the Bliss Spillar property for the City of Austin in 2002 and 2003, both times in accordance with USFWS presence/absence survey protocols. No golden-cheeked warblers were detected on or adjacent to the Bliss Spillar property by SWCA in either year. The 2002 survey was performed between 12 April and 8 May and was extended across approximately 88 acres (SWCA 2002). The 2003 survey was performed across 75 acres between 11 April and 12 May (SWCA 2003). The area surveyed in 2003 was less than the area surveyed in 2002 because the 2003 survey area excluded some of the more open woodland present in the center of the property (SWCA 2002, 2003).

Baer surveyed 93 acres on the Bliss Spillar property for golden-cheeked warblers in 2009. This survey was conducted between 13 April and 13 May in compliance with USFWS presence/absence survey protocols. Baer reported the brief observation of one non-vocalizing golden-cheeked warbler on the Bliss Spillar property on 30 April 2009. The bird was observed in the center of the property in somewhat open woodland that does not strongly resemble golden-cheeked warbler habitat. Baer concluded this bird was a transient (Baer 2009). Baer did not report detecting any other golden-cheeked warblers on or adjacent to the Bliss Spillar property during the course of the 2009 survey.

The same 93 acres of the Bliss Spillar property were surveyed again by Baer between 19 March and 5 May 2010. A total of 31 hours and 12 minutes was spent conducting the 2010 survey, which was about 12.5 hours more than the amount of time prescribed by USFWS protocols. Baer did not report detecting any golden-cheeked warblers on or adjacent to the Bliss Spillar property in 2010 (Baer 2010). The AARAL 2 property was also surveyed in 2010 for the City of Austin, but by Hicks and Company. The survey was extended across the entire property and was performed on six days between 28 March and 31 May. No golden-cheeked warblers were detected during this survey (Hicks and Company 2010).

SWCA surveyed approximately 177 acres of woodland on the Bliss Spillar and AARAL 2 properties for golden-cheeked warblers in 2013, excluding the long, narrow access easement that extends eastward from the main body of the AARAL 2 property. This survey was performed in accordance with USFWS presence/absence survey protocols between 29 March and 27 May (SWCA 2013). A golden-cheeked warbler territory was identified for the first time on the Bliss Spillar property in 2013. The territory was located along the south side of Bear Creek and overlapped onto the Bliss Spillar and AARAL 2 properties. The center of this territory appeared to be approximately 300 feet east of the eastern edge of the SH 45SW ROW, but on one occasion the male warbler was detected traveling west up to the edge of the LCRA transmission line easement. On the fourth visit to these properties (16 May), the male was observed with a female and the two were seen tending to at least two fledglings (SWCA 2013). As part of the survey of the Bliss Spillar and AARAL 2 properties in 2013, SWCA surveyors regularly walked the LCRA transmission line easement, from north of Bear Creek south to Bliss Spillar Road. SWCA did not detect any golden-cheeked warblers to the west of the LCRA transmission line easement opposite of the Bliss Spillar and AARAL 2 properties in 2013.

3.3.1.3 The Tabor, Reavley, Edward's Crossing, and AARAL Open Space Properties

The Tabor, Reavley, Edward's Crossing, and AARAL Open Space properties are mostly contiguous tracts owned by the City of Austin. Locations of these four properties are depicted on Figure 2. As can be seen on Figure 2, the SH 45SW ROW crosses through the northeast side of the Tabor property and the middle of the Edward's Crossing property, and forms the eastern boundary of the AARAL Open Space property. Away from Bear Creek, these properties largely support open to semi-open live oak/Ashe juniper woodland, with cedar elm, post oak, and blackjack oak trees occurring in low to very low densities. Shrubs are present in low to very low densities in woodland openings. Shrub species present include Texas persimmon, elbowbush, agarita, Texas kidneywood, and prickly pear (SWCA 2013).

Slopes leading down to Bear Creek on the four properties support nearly closed canopy woodland composed mostly of Ashe juniper and live oak trees, with cedar elm trees occurring in low to very low densities. As downstream where crossed by the SH 45SW ROW, the margins of Bear Creek on these properties support a relatively open strand of riparian woodland. Trees present along the creek include Texas oak, sycamore, cedar elm, Texas ash, American elm (*Ulmus americana*), Ashe juniper, Carolina buckthorn, and pecan. Shrubs present along the creek include common hop-tree, American beautyberry, buttonbush, possum-haw holly (*Ilex decidua*), red buckeye, Mexican buckeye, fragrant sumac, poison-ivy, agarita, mesquite, Texas kidneywood, shrubby boneset, Texas persimmon, and elbowbush (SWCA 2013).

A total of 397 acres of the Tabor, Reavley, and Edward's Crossing properties were surveyed in 2000 for golden-cheeked warblers by Loomis Austin, Inc. on behalf of the City of Austin. One male golden-cheeked warbler was detected on the west side of the Tabor property in 2000, a little south of Bear Creek and approximately 2,600 feet west of the SH 45SW ROW (Loomis-Austin, Inc. 2000b). This bird was detected on the last of eight visits made to the property between 4 April and 19 May. Loomis-Austin, Inc. spent 28.5 hours conducting this survey, which was almost 51 fewer hours than the level of effort required for that acreage by the USFWS survey protocols. Given this low level of effort, it is difficult for us to gauge whether the warbler detected on the final day of survey was a territorial bird that had been missed on prior visits, or if maybe it was a post-breeding wanderer.

The Tabor and Reavley properties were again surveyed for golden-cheeked warblers in 2002 and 2003 by SWCA. The 2002 survey was extended across approximately 301 acres. The eastern extent of the surveyed area extended into what is now the SH 45SW ROW. The 2002 survey was performed in accordance with USFWS presence/absence survey protocols and was performed between 12 April and 8 May (SWCA 2002). SWCA did not detect any golden-cheeked warblers on the Tabor and Reavley properties in 2002.

The same 301 acres on the Tabor and Reavley properties were surveyed again by SWCA in 2003. One male golden-cheeked warbler was detected on each of the first three visits to the Tabor property in 2003. This bird was located in the northwest portion of the property to the north of Bear Creek (SWCA 2003). The nearest this warbler was observed to what is now the SH 45SW ROW was approximately 1,200 feet. No female warbler was detected with this male. The bird was not re-found on either of the last two visits and SWCA concluded the bird most likely had abandoned the area (SWCA 2003). SWCA had noticed over its history of conducting surveys for the species that it was not uncommon for apparently unmated male warblers to disappear from isolated territories in about the third week of April, presumably to seek out more favorable reproductive opportunities elsewhere.

Baer surveyed the Tabor and Reavley properties in 2009, along with the AARAL Open Space property and the west side of the Edward's Crossing property (Baer 2009). The survey was performed between 4 April and 12 May. In 2009, one male golden-cheeked warbler was detected by Baer, mostly north of Bear Creek and mostly on the Edward's Crossing property, although it was also detected on the Tabor and

Reavley properties (Baer 2009). The bird was detected through 20 April, but was not found during subsequent visits to the property on 23 April and 4 and 11 May. No female was detected with this warbler (Baer 2009), and its disappearance at the end of the third week of April suggests to SWCA that the bird may have abandoned the property to seek its fortunes elsewhere. Baer (2009) did not speculate as to why the warbler was not detected after 20 April. The nearest this warbler was observed to the western boundary of the SH 45SW ROW was approximately 200 feet.

In 2010, Baer again surveyed the Tabor, Reavley, and Edward's Crossing properties. Approximately 223 acres were surveyed in 2010 between 19 March and 16 May. Less acreage was surveyed in 2010 on these properties than in prior years because some woodland shown by previous surveys not to be occupied by warblers had been thinned or cleared by the City of Austin following the 2009 survey. No golden-cheeked warblers were detected on the Tabor, Reavley, or Edward's Crossing properties by Baer during the 2010 survey (Baer 2010).

The AARAL Open Space property was surveyed for golden-cheeked warblers by Hicks and Company in 2010 in conjunction with its survey of the AARAL 2 property. The survey was extended across the entire property and was performed on six days between 28 March and 31 May. No golden-cheeked warblers were detected on the AARAL Open Space property during this survey (Hicks and Company 2010).

SWCA surveyed the entire AARAL Open Space property in 2013, along with portions of the Tabor and Edward's Crossing properties. The 2013 survey of the Tabor/Edward's Crossing/AARAL Open Space properties was conducted across 162 acres from 29 April through 28 May. Two male golden-cheeked warblers were estimated to be present on the Tabor/Edward's Crossing/AARAL Open Space properties in 2013, although the two birds were never heard singing at the same time (SWCA 2013). One male warbler was present in the northwest portion of the Tabor property to the north of Bear Creek, in essentially the same location where a warbler resided for at least a portion of the 2003 breeding season. The other bird established a territory east of Bear Creek, in virtually the same place where Baer detected its bird in 2009. No female or fledgling warblers were detected during the 2013 survey.

Similar to past years, both birds in 2013 were detected on each of the first three survey visits to the properties and neither bird was detected thereafter. However, in 2013, the third visit to the properties was made on 29 April, meaning the birds were detected after the third week of April. Because the birds were detected on 29 April, we concluded it most likely these warblers became difficult to detect because they were quietly tending to young, which is typical of the species in May (SWCA 2013). However, this was purely speculative and it was considered not impossible that both birds were unsuccessful in attracting mates and they each ultimately abandoned the property. The nearest the northwestern warbler was observed to the SH 45SW ROW in 2013 was approximately 1,000 feet. The southeastern warbler in 2013 was not observed closer than approximately 800 feet to the western edge of the SH 45SW ROW (SWCA 2013).

3.3.2 Habitat Modeling

TxDOT provided to SWCA an electronic shapefile of the results of the golden-cheeked warbler range-wide habitat modeling performed by Morrison et al. (2010). The shapefile consists of over 60,000 discrete polygons, each representing a patch of potential golden-cheeked warbler habitat. Each patch was assigned a probability that golden-cheeked warblers actually occur in the mapped polygon as determined by the model. The results of the Morrison et al. (2010) warbler habitat modeling in the general vicinity of the SH 45SW ROW is depicted on Figure 3. For reference, the boundaries of City-owned properties are also included on this figure. Note that the modeling was performed based on 2007–2008 satellite imagery, while the aerial photograph used to create Figure 3 was taken in 2012. It is possible that re-running the model using current aerial photography would result in different output locally as a result of changes in woodland cover since 2007–2008.

As shown on Figure 3, the Morrison et al. (2010) model identified woodlands occurring in the SH 45SW ROW as part of a relatively large patch of woodland that covers, in part, the City of Austin properties present on either side of the ROW. The probability that golden-cheeked warblers occur somewhere in the mapped patch of potential habitat that encompasses the SH 45SW ROW was calculated by the model based on the 2007–2008 satellite imagery to be approximately 89.4%.

Review of Figure 3 reveals that the habitat model identified many closely spaced discrete polygons that are separated by distances no wider than some of the breaks within the woodlands contained within the polygon of modeled habitat that encompasses the SH 45SW ROW, and by distances so narrow that they certainly would not be recognized by golden-cheeked warblers as barriers to movement. For example, the division between the patch of modeled habitat that encompasses the SH 45SW and the large patch of dark green habitat immediately to the northwest of it is barely discernible on Figure 3. As another example, to the southeast of the southern end of the SH 45SW ROW is a relatively large polygon colored green with some smaller pink and orange polygons nestled into its east side. We seriously doubt that those polygons are separated by a distance that, while able to be mapped, would matter to golden-cheeked warblers.

Size of a habitat patch was one of the criteria used by Morrison et al. (2010) to determine probability of warbler occurrence. Therefore, it seems likely that this fine subdivision of polygons of potential habitat resulted in the model identifying lower probabilities of occurrence than would have been obtained if smaller, closely spaced polygons had been collapsed into larger polygons. SWCA is unsure how collapsing closely spaced polygons into larger polygons would affect the Morrison et al. (2010) golden-cheeked warbler population estimate, but it seems it would drive it upward because of consequent increased probabilities of occurrence.

It is important to remember that the probability of warbler occurrence assigned by the Morrison et al. (2010) model to any given patch of modeled potential habitat identifies the probability that the warbler occurs somewhere in the mapped polygon and not the probability that the species fully occupies the mapped extent of the polygon. As discussed above, the surveys performed on behalf of the City of Austin indicate that warblers do in fact occur locally in the patch of modeled potential habitat crossed by the SH 45SW ROW (although apparently not on an annual basis) as portended by a predicted 89.4% probability of occurrence, although, as discussed in Section 3.3.3, warblers are not known to occur in the SH 45SW ROW.

Review of the Morrison et al. habitat modeling as shown on Figure 3 does cause SWCA to have some concern regarding the veracity of the model results in an urban/suburban landscape. The model identified many patches of potential warbler habitat to the north and northeast of the SH 45SW ROW, all of which are set within residential neighborhoods and all of which have seen little change in woodland cover between 2007–2008 and today based on review of recent aerial imagery available through Google Earth. While the model did assign low probabilities of occurrence to these patches, SWCA believes the actual probability of warbler occurrence in most, if not all, of those patches is zero and would not have identified them as potential warbler habitat. Thus, we wonder if the Morrison et al. (2010) model over-estimates probability of golden-cheeked warbler occurrence in a fragmented, urban/suburban landscape.

3.3.3 2014 Golden-cheeked Warbler Surveys

As indicated, SWCA performed a survey for the golden-cheeked warbler in the SH 45SW ROW in the spring of 2014. The decision to survey the SH 45SW ROW for the warbler was based on the presence of some woodland within the limits of the ROW that shares some basic characteristics of habitat known to be used by the species. These woodlands include the patch of dense woodland at the north end of the ROW, and woodland in and south of the Bear Creek corridor directly west of the cleared LCRA transmission line corridor opposite of the City of Austin Bliss Spillar property.

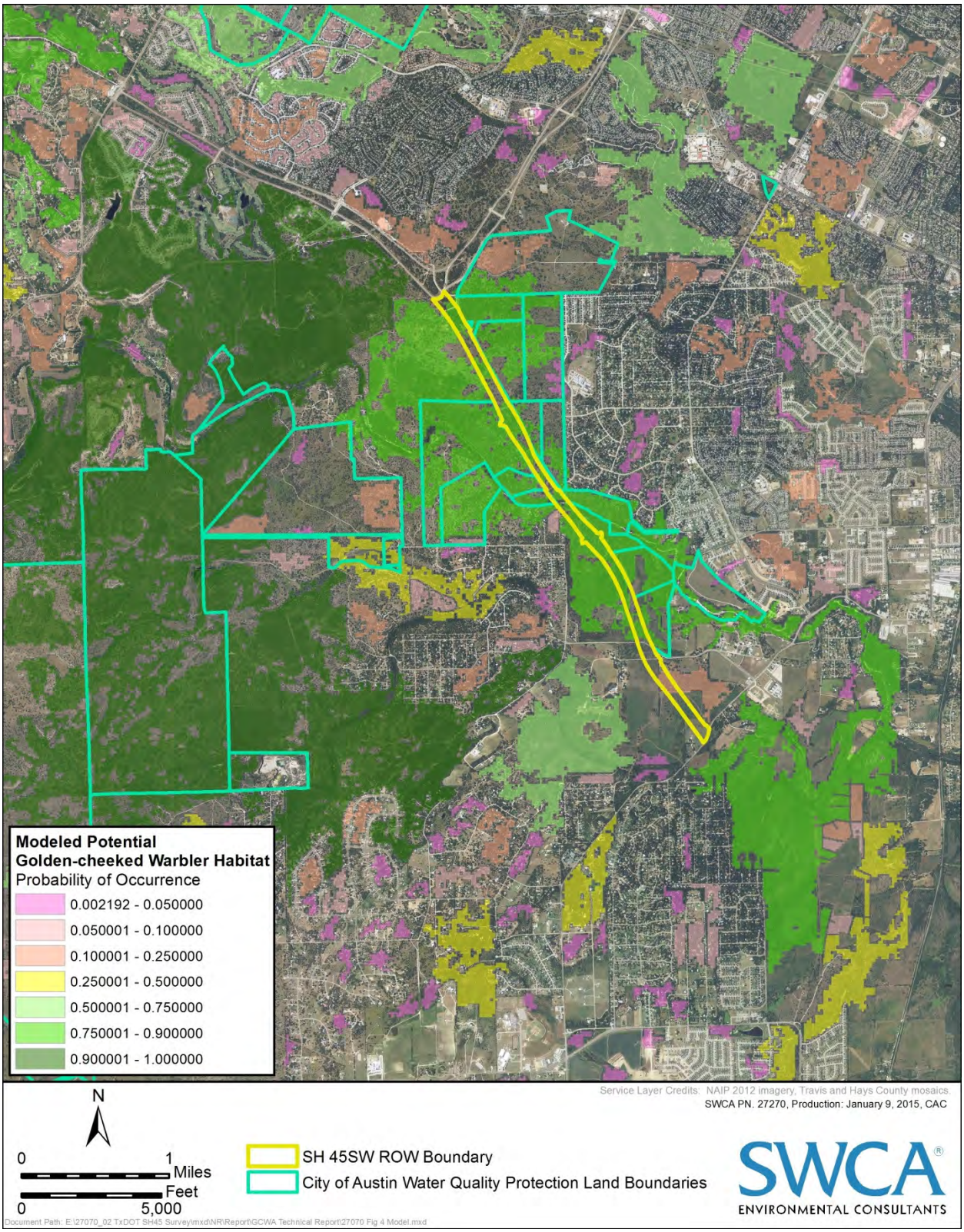

Figure 3. Distribution of potential golden-cheeked warbler habitat as modeled by Morrison et al. (2010).

The dense patch of woodland at the north end of the ROW shares some characteristics with known golden-cheeked warbler habitat, although it contains only low densities of deciduous hardwood trees, had been surveyed several times for the warbler always with negative results, and is set in a landscape that contains less woodland cover than that shown by Magness et al. (2006) as necessary to attract and support golden-cheeked warblers. Consequently, it was the expectation of SWCA prior to the start of the survey that once again no golden-cheeked warblers would be found in this patch of woodland.

SWCA was unsure of what the result of the survey would be in woodland to the west of the Bliss Spillar property. SWCA had walked the LCRA transmission line easement past that section of the SH 45SW ROW several times the previous spring without having heard any golden-cheeked warblers in that direction, and so thought it possible that no warblers would be detected in the ROW. But, because a pair of golden-cheeked warblers had successfully fledged young on the Bliss Spillar property the previous spring and the male of the pair could be heard singing from the LCRA transmission line easement, SWCA expected at a minimum that the survey would result in detection of a golden-cheeked warbler on the City of Austin property to the east.

No other woodland in the SH 45SW ROW appeared to SWCA to have any reasonable likelihood of being occupied by golden-cheeked warblers. However, for the sake of thoroughness and absolute certainty, it was determined prudent to extend the warbler survey to all wooded portions of the SH 45SW ROW. Thus, all juniper- and oak-bearing woodlands occurring in the SH 45SW ROW were incorporated into the 2014 survey area, including the patch of live oak woodland to the south of Old Bliss Spillar Road that completely lacks mature Ashe juniper trees.

In addition, it was known that the USFWS typically considers construction projects as having potential to indirectly affect golden-cheeked warblers up to 300 feet away from the limits of the construction activity. Potential indirect effects typically identified by the USFWS include noise and human activity, as well as effects resulting from creation of new habitat edges such as subjecting warblers to increased levels of predation and nest parasitism by brown-headed cowbirds (*Molothrus ater*). Therefore, we were interested to know the status of golden-cheeked warblers in woodlands within 300 feet of the limits of the SH 45SW ROW. Access to lands outside of the SH 45SW ROW was not available to SWCA, but golden-cheeked warblers can easily be heard singing from more than 300 feet away.[2] Therefore, woodlands occurring within 300 feet of the boundaries of the SH 45SW ROW were also incorporated into the 2014 survey area, with those lands surveyed from the ROW fence lines. The amount of time spent surveying was increased to meet the USFWS survey protocols for the total survey area (acreage of woodland in the ROW plus woodlands within 300 feet).

A second federally endangered songbird, the black-capped vireo (*Vireo atricapilla*) has a breeding range that includes the Edwards Plateau of Travis and Hays counties. No vegetation appearing similar to known black-capped vireo habitat is present in the SH 45SW ROW. No survey for the vireo was considered necessary and, initially, no survey for the species was planned. However, after further consideration, it was decided to also survey the SH 45SW ROW for the black-capped vireo. Reason for including the vireo in the survey was two-fold. First, the USFWS presence/absence survey protocols for the black-capped vireo are nearly identical to those for the golden-cheeked warbler, differing only in survey season (10 April - 1 July for the vireo, 15 March – 1 June for the warbler) and daily survey cut-off time (1:00 p.m. for the vireo, 7 hours after sunrise for the warbler). Thus, the survey could cover both the warbler and vireo by performing it during the overlap period between the two survey seasons without adding any

[2] The distance out to which a person can hear a golden-cheeked warbler varies greatly by individual person, as well as by the volume of the song put forth by the bird. Under perfect weather and topographic conditions, people with acute hearing can sometimes hear the birds out to distances of 1,200 feet or more. However, based on the experience of SWCA, under normal conditions the average distance at which the birds can be heard singing is likely in the range of 400 to 600 feet.

additional requirements or cost to the survey. The second reason was that it was known that other work (e.g., excavation of karst features) would be performed in the SH 45SW ROW during the spring of 2014 that could require the minor clearing of vegetation. Second-year male black-capped vireos are somewhat notorious for being unpredictable in where they choose to spend their first independent breeding season, so the survey was also extended to this species to be absolutely certain that any vegetation clearing performed in association with the excavation of karst features would not disturb a black-capped vireo.

The area ultimately identified by SWCA for survey in 2014 was delineated through review of recent digital aerial photography and using ArcGIS software. An electronic shapefile of the SH 45SW ROW boundary was provided to SWCA by TxDOT. SWCA then used ArcGIS to draw a 300-foot buffer around the limits of the SH 45SW ROW and from that area trimmed out all open grassland vegetation, mesquite woodlands, paved roads, and barren areas that obviously could not provide habitat for the golden-cheeked warbler or black-capped vireo. The remaining vegetated portions of the SH 45SW ROW and land within 300 feet of the ROW boundaries were identified as the 2014 survey area. Total area incorporated into the survey area was approximately 334.9 acres. The configuration of this survey area is depicted on Figure 4.

3.3.3.1 2014 City of Austin Surveys

The City of Austin contracted with Baer to have portions of the Tabor, AARAL 1, and Edward's Crossing properties surveyed for the golden-cheeked warbler in the spring of 2014. In addition, the City of Austin arranged to have its own BCCP biologists conduct surveys for the warbler and vireo on all City-owned lands occurring within 300 feet of the SH 45SW ROW in 2014; these surveys were conducted over the course of three visits (K. Thuesen/City of Austin, pers. comm. to SWCA on 5 June 2014).

3.3.3.2 SWCA Survey Methodology

The 2014 survey of the SH 45SW ROW and land occurring within 300 feet of its boundaries was performed by SWCA in accordance with presence/absence survey protocols established for the golden-cheeked warbler and black-capped vireo by the USFWS. The survey was performed by SWCA biologists experienced with conducting surveys for both bird species and permitted by the USFWS to conduct surveys for the species under SWCA permit no. TE-800611-4.

Survey visits to the SH 45SW ROW were made on 16, 21, and 28 April and 9, 16, and 23 May 2014. A total of 71 hours and 53 minutes was spent conducting the survey over these six dates. According to USFWS protocols, a 334.9-acre survey area requires a minimum of 66 hours and 59 minutes of survey time. Weather on all survey dates was within accepted standards. A summary of survey dates, times, and weather conditions is provided in Table 2. The survey was conducted by one to three people each visit. The surveyors typically walked lengthwise back-and-forth along the ROW, including along ROW fence lines, listening for golden-cheeked warbler and black-capped vireo vocalizations.

Special attention was paid during the survey to the ROW in the vicinity of Bear Creek and to off-site woodland to the east of the ROW south of Bear Creek (i.e., the Bliss Spillar property). The Bliss Spillar property is separated from the SH 45SW ROW by the 50- to 100-foot-wide grassy LCRA transmission line easement. The City of Austin property is fenced but no fence separates the LCRA transmission line easement from woodland in the SH 45SW ROW. Thus, the surveyors were able to listen for warblers on the City of Austin property from the edge of woodland on the City-owned property, in exactly the same places from which the warbler on the Bliss Spillar property could be heard singing in 2013.

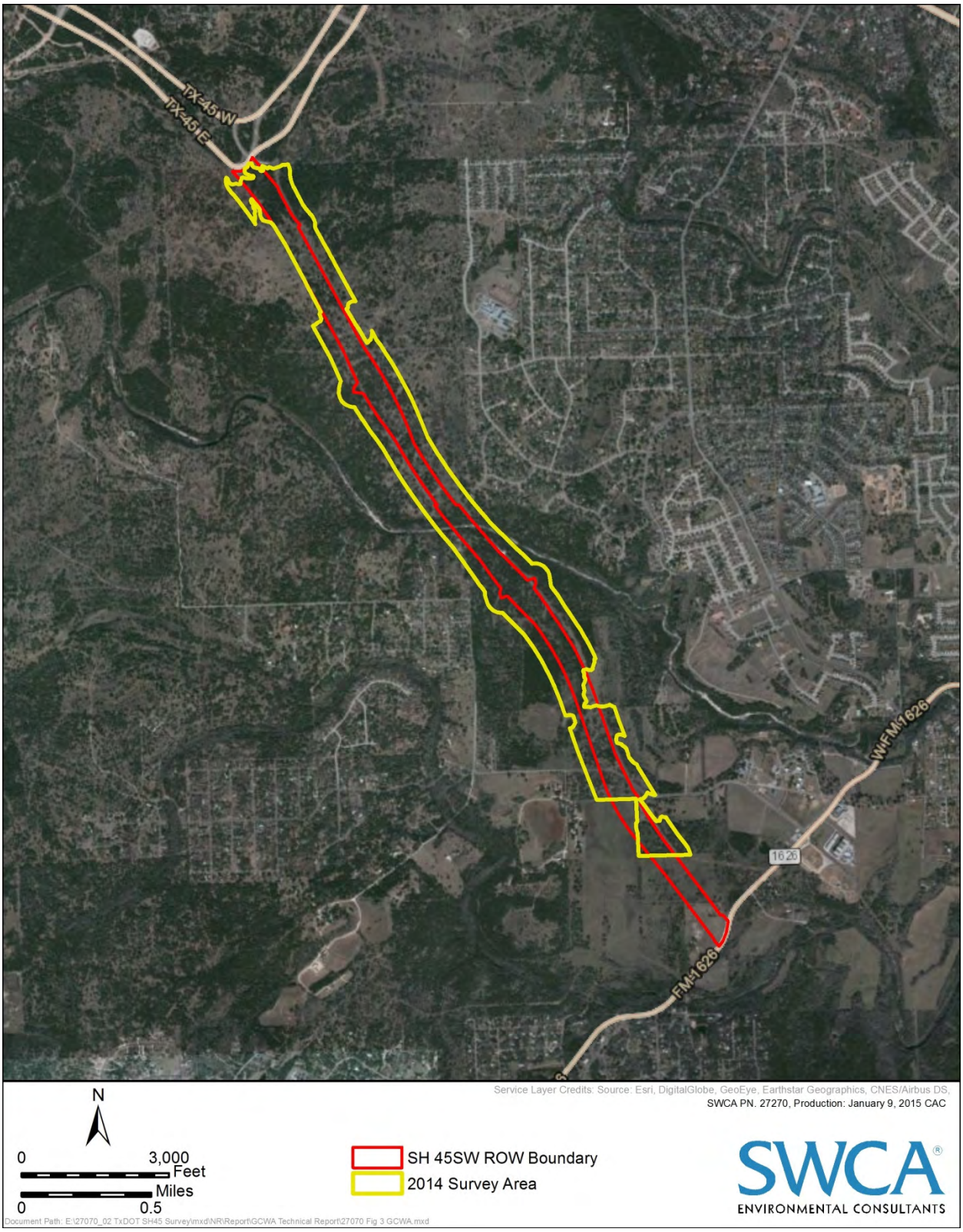

Figure 4. SH 45SW 2014 golden-cheeked warbler survey area.

Table 2. Summary of SH 45SW Survey Dates, Times, and Weather Conditions

Survey Date	Start Time	End Time	Weather
16 April	0655	1404	Partly cloudy; 41-68° F; calm early, winds ending 10-12 mph
21 April	0659	1359	Cloudy to mostly cloudy; 66-72° F; winds SE 3-10 mph
28 April	0645	1330	Clear to partly cloudy; 72-90°; winds SW 3-8 mph
9 May	0635	1335	Cloudy; 75-77° F; calm early, winds ending gusty SE 1-10 mph
16 May	0630	1330	Clear; 60-82° F; winds SSW 3-12 mph
23 May	0600	1330	Cloudy to partly cloudy; 72-82° F; winds SE 1-10 mph

3.3.3.3 SWCA Survey Results

No golden-cheeked warblers or black-capped vireos were detected by SWCA anywhere within or adjacent to the SH 45SW ROW during the 2014 survey. To provide a greater chance of detecting a golden-cheeked warbler on the City of Austin property, an SWCA biologist on 28 April spent 31 minutes listening from a point a short distance south of LCRA transmission structure no. 23, which was the point from which the golden-cheeked warbler could best be heard singing from the LCRA transmission line easement in 2013. The biologist also spent 1 hour at this location on 16 May and 1 hour and 20 minutes at the spot on 23 May.

During the 23 May visit, SWCA personnel played recordings of golden-cheeked warbler and black-capped vireo songs at various points within the SH 45SW ROW in an effort to elicit response from any birds that may have been silent or otherwise gone undetected during the survey. This included the playing of golden-cheeked warbler songs at the eastern edge of the SH 45SW ROW to the south of LCRA transmission structure no. 23 and in woodland along Bear Creek, among other places. No golden-cheeked warbler or black-capped vireos responded to playback of their songs.

3.3.3.4 City of Austin 2014 Survey Results

No golden-cheeked warblers or black-capped vireos were detected on City-owned lands within 300 feet of the boundaries of the SH 45SW ROW during surveys performed by City of Austin BCCP biologists in 2014 (K. Thuesen/City of Austin, pers. comm. to SWCA on 5 June 2014). This result was identical to SWCA's result of surveying those same areas from the SH 45SW ROW fence lines.

One male golden-cheeked warbler was detected on the Tabor property by Baer in 2014. This warbler was located in the northwestern portion of the property, generally in the same location where a bird was found by SWCA in 2003 and 2013, approximately 1,300 feet or more west of the western edge of the SH 45SW ROW (K. Thuesen/City of Austin, pers. comm. to SWCA on 5 June 2014). No golden-cheeked warbler was found in 2014 in the other location on the Tabor property where a bird has been detected intermittently over the years, which is north of Bear Creek generally where the Tabor, Reavley, and Edward's Crossing properties all meet. As discussed previously, a golden-cheeked warbler was found at that location in 2009 and 2013.

3.3.4 Conclusion

No golden-cheeked warblers were detected in or adjacent to the SH 45SW ROW in 2014. The 2014 survey indicates that golden-cheeked warblers do not occur regularly in the SH 45SW ROW. The survey provided further confirmation that the species does not occur in the dense patch of woodland that extends

into the very north end of the SH 45SW ROW, and that the species occurs intermittently at best within 300 feet of the ROW on lands owned by the City of Austin.

A pair of golden-cheeked warblers nested on the Bliss Spillar property in 2013, but no warblers were found to occupy that property during surveys conducted in 2000, 2002, 2003, 2009, 2010, and 2014. Hence, absence of the golden-cheeked warbler from the Bliss Spillar property appears to be the normal condition and the 2013 occurrence appears to be an anomaly. SWCA identified golden-cheeked warbler habitat on the Bliss Spillar property following the 2013 survey it conducted for the City of Austin, with delineated habitat extending up to the eastern edge of the LCRA transmission line easement (SWCA 2013). This delineation was based in part on presumption that presence of a nesting pair of warblers in 2013 was likely to mean repeated occupation of the property in 2014. Based on the 2014 survey results, we now believe that what we delineated as warbler habitat on the Bliss Spillar property should at best be considered irregularly occupied habitat.

Surveys have demonstrated that golden-cheeked warblers occur more often, but still irregularly, on the Tabor property to the west of the SH 45SW ROW. A male warbler has occurred in the northwest corner of the Tabor property well to the west of the SH 45SW ROW, in 2014, 2013, 2003, and, perhaps, 2000, but a bird was not found in this location in 2010, 2009, or 2002. A male warbler was found closer to the SH 45SW ROW near the southeast corner of the Tabor property in 2013 and 2009, but not in 2014, 2010, 2003, 2002, or 2000. SWCA also delineated golden-cheeked warbler habitat on the Tabor/Edward's Crossing properties following completion of its 2013 surveys, with delineated habitat extending to within approximately 500 feet of the western boundary of the SH 45SW ROW (SWCA 2013). Given the results of the 2014 survey and surveys from earlier years, this also should most properly be considered irregularly occupied habitat.

As shown on Figure 3, the Morrison et al. (2010) model identified all woodlands occurring within the SH45SW ROW as part of a greater patch of potential golden-cheeked warbler habitat having an approximately 89.4% chance of being occupied by the species. Surveys performed on behalf of the City of Austin have shown that portions of this patch of woodland are, in fact, occupied by golden-cheeked warblers, but not on an annual basis. The fact that the Morrison et al. (2010) map identified potential golden-cheeked warbler habitat within the SH 45SW ROW does not automatically qualify woodlands in the ROW as habitat. All field surveys performed to date have failed to result in detection of golden-cheeked warblers within the SH 45SW ROW, strongly suggesting that no habitat used by warblers is present within the actual boundaries of the ROW. Habitat models are useful only when site-specific survey data are not available. If surveys were conducted in all patches of woodland within the range of the golden-cheeked warbler, there would be no use for habitat models at all.

No evidence exists to demonstrate usage of woodlands in the SH 45SW ROW by golden-cheeked warblers. If circumstances were different, and the patch of woodland at the north end of the ROW was surrounded by other woodland instead of open rangeland and residential development, then perhaps a golden-cheeked warbler would be present in that location. But, circumstances are not different and landscape-level land use conditions appear to preclude that woodland from providing habitat to golden-cheeked warblers (Magness et al. 2006).

An insufficient amount of woodland on the landscape does not explain why golden-cheeked warblers have not been found in woodland to the south of Bear Creek and west of the Bliss Spillar property. Using ArcGIS software and recent digital aerial photography, we determined that more than 90% of the landscape is wooded within 400 meters of the center of the woodland present in the SH 45SW ROW to the south of Bear Creek. Applying the findings of Magness et al. (2006), more than enough woodland is present on the local landscape to attract golden-cheeked warblers to this area. Thus, other factors must be responsible for absence of golden-cheeked warblers from this woodland.

Woodland in the SH 45SW ROW to the south of Bear Creek occurs as two distinct types. The more widespread type is heavily dominated by Ashe juniper. This woodland contains live oak trees in reasonable densities but deciduous hardwoods, which are favored by golden-cheeked warblers over live oak trees, occur in the woodland only in very low densities. The paucity of deciduous trees likely is a contributing factor in the absence of golden-cheeked warblers from woodlands in and west of the SH 45SW ROW. It also likely helps explains why golden-cheeked warblers do not occur regularly on the City of Austin Bliss Spillar property. As viewed on aerial photography this woodland has a nearly closed canopy, but most of the Ashe juniper trees range in height from 10 to 20 feet tall, meaning canopy height is uneven and much of it is on the low side of suitability for the golden-cheeked warbler. This also likely contributes to absence of the golden-cheeked warbler from this woodland.

The second type of woodland is composed of very large live oak and cedar elm trees, with Ashe juniper largely occurring as saplings in the woodland understory. This woodland is limited in extent to one grove present about midway between Bear Creek and Bliss Spillar Road. The absence of mature Ashe juniper trees from this grove may render it unsuitable for use by golden-cheeked warblers, even though older Ashe juniper trees appear to be readily available directly outside of the grove.

The structure of the woodland south of Bear Creek and local relative abundance of deciduous hardwoods and mature Ashe juniper help explain why golden-cheeked warblers do not occur in the SH 45SW ROW in this area. However, SWCA believes that location of the woodland on the very eastern edge of the range of the species may be the most important reason that golden-cheeked warblers are absent from this area, as well as the main reason that warblers occur irregularly on City of Austin lands to the west of the ROW.

Pulich (1976) observed that golden-cheeked warblers "are apt to be found in rather loose territorial groups, sometimes almost at random." The tendency of individuals of the same species to choose to live close to one another is referred to as conspecific attraction. Such behavior has been documented in a wide variety of animals, and it has been suggested to exist in golden-cheeked warblers (Campomizzi et al. 2008). Many reasons have been given for conspecific attraction behavior, all of them plausible but not all necessarily applicable to golden-cheeked warblers. Peak (2010) found that male golden-cheeked warblers will mate with more than one female warbler in a breeding season, and can even be involved with two nestings at the same time. Improving their chances to reproduce is one obvious reason golden-cheeked warblers might congregate in a particular area.

Despite the distribution of potential golden-cheeked warbler habitat as modeled by Morrison et al. (2010) and shown on Figure 3, SWCA believes it is highly likely that no golden-cheeked warblers occur regularly to the east of the SH 45SW ROW in southern Travis County. Golden-cheeked warblers are known to occur regularly farther to the west of the SH 45SW ROW on City of Austin land located west of the Tabor property (SWCA 2013), with those birds occurring in habitat contained within the large, dark green polygon shown on Figure 3. If golden-cheeked warblers prefer to be close to members of their own kind, then it would make sense that any golden-cheeked warbler looking to settle in southern Travis County would choose to establish a territory farther to the west where they would have opportunities to interact with other warblers, instead of in an isolated patch of woodland along the SH 45SW ROW corridor that is devoid of members of their own kind, regardless of the character of the woodland.

4.0 GOLDEN-CHEEKED WARBLER IMPACT ASSESSMENT

Impacts to an individual organism resulting from a particular activity can be direct or indirect. Direct impacts are those immediate and direct responses to a particular action. Such impacts can be expected to result in death or physical injury to the individual and, as a result, are typically provable. Indirect impacts are foreseeable impacts that also result from performance of particular activity, but occur later in time or

at distance from the site of the activity. Because indirect impacts are realized after an action has been performed, their causes can sometimes be difficult to identify and often are difficult to prove.

In all cases, however, the individual has to be present to be directly or indirectly impacted by the action. With regard to SH 45SW and the golden-cheeked warbler, no golden-cheeked warblers were detected in or within 300 feet of the SH 45SW ROW during surveys conducted in 2014 by SWCA and City of Austin BCCP biologists. Thus, no golden-cheeked warblers are currently available to be impacted by construction of the highway.

The ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS regulations define *harm* as "an act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering." The agency defines *harass* as an "intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding and sheltering" (50 CFR 17.3 [2005]). Based on the list of prohibited acts, a theoretical road construction project and its associated vegetation clearing appear capable only of causing a violation of the ESA by harassing, harming, wounding, or killing golden-cheeked warblers. Road construction/vegetation clearing would not be expected to result in pursuit, hunting, shooting, trapping, capturing, or collecting members of the species. But under any scenario, golden-cheeked warblers would have to be present when a construction or clearing activity occurred in order to have any possibility of being killed, wounded, harmed, or harassed.

Because no golden-cheeked warblers were present in or directly adjacent to the SH 45SW ROW in 2014, no direct or indirect impacts to individual golden-cheeked warblers would be expected to occur. The potential for construction of SH 45SW to impact golden-cheeked warblers is discussed below in light of the possibility that golden-cheeked warblers could again occur in general proximity to the SH 45SW ROW.

4.1 Direct Impacts

In theory, road construction activities could result in death or injury of golden-cheeked warblers if active nests were present in a ROW when it was cleared of vegetation. Adult birds or fledged young should be able to fly away to avoid being killed or injured by vegetation clearing activities, but eggs in a nest could be destroyed and very recently fledged warblers could be too immobile to avoid being killed or injured by such operations. Because the species is migratory, however, the potential for vegetation clearing activities to directly impact individual golden-cheeked warblers can be avoided altogether by performing those activities during the time of year when the birds are outside of the United States. SWCA expects that whenever the clearing of the SH 45SW ROW is performed in advance of highway construction, it would be performed outside of the golden-cheeked warbler breeding season.

It is also possible that a pair of golden-cheeked warblers could be nesting in woodland directly adjacent to a theoretical ROW when a roadway clearing activity was initiated, with the subsequent disruption being of sufficient level to cause the birds to abandon their nest, leading to loss of eggs or starvation of nestlings. In the case of SH 45SW, however, as mentioned above, SWCA expects TxDOT would conduct ROW clearing activities outside the golden-cheeked warbler nesting season, so it is also expected that clearing of the ROW could not cause birds to abandon nests outside the ROW. Consequently, under no circumstance is it expected that any golden-cheeked warblers would be killed or injured by vegetation clearing activities conducted within the SH 45SW ROW.

Based on the results of surveys performed on adjacent City of Austin properties, it is known to be possible, but not likely, that golden-cheeked warblers could be nesting in woodland adjacent to the ROW while road construction activities were performed. Studies performed on the possible effects of road construction on golden-cheeked warblers have demonstrated that road construction noise and activity have no effect on golden-cheeked warbler pairing success, territory placement, or productivity (Lackey et al. 2011, Pruett et al. 2014). Consequently, if warblers were nesting in woodland adjacent to the ROW while road construction was being performed, the noise and activity associated with construction would not be expected to affect the success of the nesting activity.

Because vegetation clearing activities within the SH 45SW ROW are expected to be performed outside of the golden-cheeked warbler breeding season and because studies have shown that road construction noise and activity do not affect golden-cheeked warbler pairing success or productivity, no direct impacts to golden-cheeked warblers are expected as a result of construction of SH 45SW.

4.2 Indirect Impacts

It may not be immediately obvious, but Lackey et al. (2011) and Pruett et al. (2014) could not be studying the effects of road construction noise on golden-cheeked warblers if golden-cheeked warblers did not occur next to roads. Examples of specific locations where golden-cheeked warblers occur next to roads are too numerous to list, but SWCA has observed the species directly adjacent to roads of all types and traffic loads, including at two different locations within the median of Interstate Highway 10 (SWCA 2012).

In general, the construction of a road in a new location adjacent to or through habitat regularly utilized by golden-cheeked warblers has the potential to cause the following indirect impacts to the species:

- **Habitat loss --** The clearing of warbler habitat from a road ROW can result in displacement of birds from previously occupied areas and a reduction in overall habitat carrying capacity, which over time, depending on the scale of the clearing, could result in a reduction in local warbler populations. The USFWS typically considers the clearing of regularly occupied golden-cheeked warbler habitat, even if performed outside of the breeding season, to create the potential to *harm* the species, which is a prohibited form of *take* under Section 9 of the ESA. This potential indirect impact does not apply to the SH 45SW project because no evidence suggests that any habitat used by golden-cheeked warblers is present in the SH 45SW ROW.

- **Reduction in habitat patch size** – The incomplete cutting of a patch of habitat results in a reduction in the size of that patch. Depending on the amount of habitat cut and the original patch size, the cutting of that habitat may have no effect on the status of warblers in the patch, or it could result in partial or complete displacement of birds from the remaining habitat owing to minimum patch size requirements. This potential indirect impact also does not apply to the SH 45SW project, again because no evidence suggests that any habitat used by golden-cheeked warblers is present in the SH 45SW ROW.

- **Habitat fragmentation** – The incomplete cutting of a patch of habitat can sometimes cause remaining habitat to be distributed amongst multiple isolated smaller patches of habitat. This can be a concern for less mobile species, but it is not a major concern for golden-cheeked warblers because they can easily cross gaps between habitat patches. We have seen the USFWS and others sometimes refer to *habitat fragmentation* when discussing the potential effects of a particular activity, but the actual effects contemplated are nearly always expected to be realized as a result of habitat loss, reduction in habitat patch size, or some type of habitat edge effect rather than simple fragmentation of habitat. Regardless, this potential indirect impact also does not apply to

the SH 45SW project because no habitat would be expected to be fragmented by clearing of the highway ROW.

- **Increase in predation rates** – Boundaries between sharply contrasting habitat types are often referred to as habitat edges. The cutting of woodland habitat can create a sharp division or edge between remaining woodland and newly opened areas. Golden-cheeked warblers will occur at both the edge and in the interior of woodlands. Peak (2007) found that golden-cheeked warblers suffer lower nest success rates close to woodland edges as a result of increased nest depredation rates, with most losses caused by snakes. It is believed that snakes prefer woodland edges over woodland interior because access to adjacent sunnier, open areas enhances their thermoregulation capabilities. Clearing of the SH 45SW ROW would create new woodland edges in some locations, but not in either location where golden-cheeked warblers have occurred on City of Austin lands in the past in general proximity to the ROW. Woodland occupied in 2013 by the pair of golden-cheeked warblers on the Bliss Spillar property already has an abrupt western edge because it is separated from woodland in the SH 45SW by the grassy LCRA transmission line easement. A similar situation exists for the location where a golden-cheeked warbler has twice been observed west of the SH 45SW ROW in the southeastern portion of the Tabor property. Woodland where those birds have occurred is separated from the SH 45SW ROW by the one section of LCRA transmission line easement that runs along the west side of the ROW. Therefore, for locations where golden-cheeked warblers have occurred in the past, construction of SH 45SW is not expected to alter the ability of predators to access the adjacent woodlands. In fact, traffic on SH 45SW might result in an overall decrease in snakes in the area as a result of vehicle collision mortality.

- **Increase in cowbird parasitism rates** – Similar to the impact discussed immediately above, the cutting of woodland habitat can result in increased rates of golden-cheeked warbler nest parasitism by brown-headed cowbirds. Cowbirds prefer open habitats and, as a result of greater accessibility, cowbird nest parasitism rates are greater along woodland edges than they are in woodland interiors (Brittingham and Temple 1983). As discussed directly above, the clearing of the SH 45SW ROW would not create new woodland edges in proximity to locations where golden-cheeked warblers have occurred previously on lands owned by the City of Austin. Consequently, construction of the highway is not expected to alter local cowbird nest parasitism rates on golden-cheeked warblers.

- **Change in woodland structure and species composition –** The cutting of woodland habitat can result in alteration of the species composition and structure of remaining woodland along newly created woodland perimeters as a result of changes in light exposure, air temperature, soil moisture, and humidity (Gehlhausen et al. 2000). Removal of tree canopy allows more sunlight to reach the ground, which in turn promotes the growth of shrubby understory species and in some cases can allow exotic tree species to invade the woodland. This type of effect is usually realized only at the woodland perimeter. The actual effect that this type of alteration can have on golden-cheeked warblers if not involving invasion by exotic species is probably minor given that their woodland habitat often has a partially open canopy (Campbell 2003) and so is typically subjected to more exposure than true closed canopy forest. With regard to SH 45SW, clearing of the ROW is expected to have a negligible effect on vegetation community structure on either side of the ROW, both because woodlands present in the area mostly have a semi-open canopy and are patchily distributed amongst more open rangeland communities, and because clearing for the LCRA transmission line has already created a cleared edge along sides of the ROW.

Given that golden-cheeked warblers occupy woodlands adjacent to roadways throughout their breeding range, it is not inconceivable that after completion of SH 45SW, one or more warblers would over time choose to establish a territory in general proximity to the highway ROW. But, the studies performed by

Lackey et al. (2011) and Pruett et al. (2014) indicate that noise generated by post-construction use of SH 45SW should not be expected to impair the ability of any golden-cheeked warblers to find mates or successfully raise young, should they choose to settle in proximity to the completed highway. Thus, based on the above, no indirect impacts to those golden-cheeked warblers would be expected to result from presence and use of the highway.

4.2.1 Future Use of Woodlands on City of Austin Lands by Golden-cheeked Warblers

The ESA protects individual golden-cheeked warblers against take. Based on the above discussions, SWCA does not believe that construction of SH 45SW would result in any impacts that could result in death or injury of golden-cheeked warblers. In large part this belief stems from survey evidence that indicates golden-cheeked warblers do not occur regularly in proximity to the SH 45SW ROW. It is furthered by expectation that TxDOT would clear vegetation from the SH 45SW ROW outside of the golden-cheeked warbler breeding season and is backed by results of studies that indicate road noise does not impair the ability of golden-cheeked warblers to find mates or successfully raise young.

Because SWCA was asked by TxDOT to examine how construction of SH 45SW could impact the golden-cheeked warbler (as opposed to being asked whether or not we believed construction of the road was likely to result in take, since not all impacts have the ability to rise to the level of take), we decided to investigate how construction of the highway might influence future use of woodlands on nearby City of Austin lands. Surveys performed to date indicate that golden-cheeked warblers occur irregularly in woodlands on either side of the SH 45SW ROW, and more frequently to the west of the ROW than to the east. Golden-cheeked warblers have been found to occupy the Bliss Spillar property to the east of the ROW in 1 out of 7 (14.3%) years that the property has been surveyed. To the west of the ROW, warblers have been found in the northwest portion of the Tabor property in 4 out of 7 (57.1%) years and closer to the SH 45SW ROW in the southeast portion of the property in 2 out of 7 (28.6%) years of survey.

As discussed, Magness et al. (2006) showed that the amount of woodland present on the landscape influences usage of woodlands by golden-cheeked warblers. While clearing of the SH 45SW ROW is not expected to result in the loss of any woodland known to be used by golden-cheeked warblers, it would reduce the total amount of woodland present on the local landscape. If that reduction caused the total amount of woodland present on the local landscape to drop below the 40% threshold shown by Magness et al. (2006) as necessary for warbler occurrence, then construction of SH 45SW could influence the future rate at which woodlands on nearby City of Austin lands are used by golden-cheeked warblers.

Before proceeding further with this discussion, it is important to point out that we do not believe that altering the future rate of frequency of use of woodland by golden-cheeked warblers could possibly be interpreted as a violation of the ESA in cases where golden-cheeked warblers do not occur regularly in the area under consideration. Causing the displacement of birds from a patch of woodland that is occupied by the species on an annual basis might qualify as take through the definition of harm. However, in a case such as the woodlands on either side of the SH 45SW ROW, where survey evidence indicates that more often than not golden-cheeked warblers are absent from woodlands nearest the ROW, the clearing of woodland outside of the areas where the birds have occurred could at worst preclude some future warbler from choosing to establish a territory in woodland near the SH 45SW ROW. While we are not attorneys and do not speak for the USFWS, this does not appear to us to be an impact that rises to the level of take.

To examine the effect that clearing of woodland from the SH 45SW ROW might have on future usage of nearby woodlands by golden-cheeked warblers, we used ArcGIS software and recent publicly available digital aerial photography (National Agriculture Imagery Program 2012) to delineate all woodland with canopy closure of at least 30% within 1,000 meters of the boundaries of the SH 45SW ROW. We then established a system of grid points with a 10-meter spacing across the SH 45SW ROW and on all lands occurring within 600 meters of the ROW, and used ArcGIS software to quantify the amount of woodland

present on the landscape within 400 meters of each of those points (a 400-meter radius circle is hereafter referred to as the *local landscape*). The amount of woodland present on the local landscape was expressed as a percentage of the total area of a 400-meter radius circle. From that we produced a contour map depicting the amount of woodland cover present on the local landscape at all points occurring within 600 meters of the SH 45SW ROW.

We then used ArcGIS software to simulate the removal of all woodland from the SH 45SW ROW and repeated the calculations at each grid point and created a second contour map in order to illustrate how clearing of the ROW would affect the amount of woodland cover present on the local landscape following construction of the highway. The results of these calculations are depicted on Figure 5. Included on Figure 5 are locations of golden-cheeked warbler observations made by SWCA on City of Austin properties in 2013. For ease of reference, we reduced the contours on Figure 5 to depict local landscape woodland cover in three classes: 1) less than 40% (golden-cheeked warblers not expected to occur); 2) 40% to 80% (golden-cheeked warblers could occur); and 3) greater than 80% (better than a 50% chance that golden-cheeked warblers would occur). Note that not all woodland is expected to be removed from the SH 45SW ROW as a result of road construction, but at the time the analysis was performed, SWCA was not aware of where woodland would be retained within the ROW and so we simulated full removal of woodland from the ROW as a worst-case scenario.

As shown on Figure 5, fitting rather neatly with the findings of Magness et al. (2006), golden-cheeked warblers in 2013 occurred in the only sizable areas where woodland cover exceeds 80% on the local landscape. The precise location of warblers within those areas is likely tied to the distribution of deciduous trees. In all three locations, ephemeral tributaries lead down to Bear Creek, with these drainages supporting elevated densities of deciduous trees compared to woodland present elsewhere in the Bear Creek corridor.

As also shown on Figure 5, the clearing of the SH 45SW ROW, would cause percent woodland cover to drop below 80% to the east of the ROW where a golden-cheeked warbler occurred in 2013. This suggests that following road construction, future use of the woodland on the Bliss Spillar property by golden-cheeked warblers would still remain possible because woodland cover would still exceed the minimum 40% shown by Magness et al. (2006) as necessary for warbler occurrence. While clearing of the ROW seemingly would cause the chance for future warbler occurrence on the Bliss Spillar property to drop below 50%, surveys performed to date have found that warblers have occupied the Bliss Spillar property only 14.3% of the time (1 out of 7 years of survey). Thus, it does not appear particularly meaningful that the clearing of the ROW would cause the chance for warbler occurrence on the Bliss Spillar property to drop below 50% because that seems to be the current condition. As discussed, the reason for this is likely tied to the SH 45SW ROW and Bliss Spillar property being located at the very eastern edge of the range of the warbler and conspecific attraction acting to pull warblers farther to the west where they have better opportunity to interact with members of their own kind.

To the west of the SH 45SW ROW, less woodland on the Tabor property would be set in a local landscape with woodland cover exceeding 80% following the clearing of the ROW. However, percent woodland cover on the local landscape at locations where golden-cheeked warblers have occurred would not change much, especially at the northerly location where warblers have occurred more often (4 out of 7 surveys compared to 2 out of 7 surveys at the southerly location). Because a rather extensive amount of woodland set in a landscape with greater than 80% woodland cover would remain on the Tabor property following the clearing of the ROW, SWCA expects that golden-cheeked warblers would continue to occur at those same locations on an irregular basis as they currently do.

Figure 5. Pre- and post-construction levels of woodland cover on the local landscape surrounding the SH 45SW ROW.

5.0 SUMMARY AND CONCLUSIONS

No golden-cheeked warblers were detected in or adjacent to the SH 45SW ROW in the spring of 2014 during a survey conducted in accordance with USFWS presence/absence survey protocols. Surveys conducted on nearby City of Austin Water Quality Protection Lands indicate that golden-cheeked warblers in some years occur in woodlands on either side of the ROW. Warblers have occurred very infrequently (1 out of 7 years) to the east of the ROW on the Bliss Spillar property, and with greater frequency on the Tabor Property to the west of the ROW (2 out of 7 years at one location and 4 out of 7 years at another location). It is believed most likely that location of the ROW and these properties at the eastern edge of the range of the warbler and conspecific attraction act to preclude warblers from occurring in these locations with greater regularity.

The clearing of the SH 45SW ROW would not cause the direct loss of any woodland known to be used by golden-cheeked warblers. The clearing also would not fragment or reduce the size of any warbler habitat occurring on City of Austin properties adjacent to the ROW. Clearing performed by LCRA for construction of a transmission line has already created a cleared edge along the woodland to the east and west of the SH 45SW ROW that is contiguous with the woodland in which golden-cheeked warblers have occurred, so clearing of the SH 45SW ROW also would not subject these patches of woodland to deleterious edge effects.

Clearing of the SH 45SW ROW would reduce the total amount of woodland present on the landscape within 400 meters of locations where golden-cheeked warblers have occurred on City of Austin properties. Magness et al. (2006) showed that total amount of woodland on the landscape was a determining factor in whether or not warblers would occur in a particular patch of woodland. Following clearing, all woodland on City of Austin properties where golden-cheeked warblers have occurred in the past would remain set in landscapes with woodland cover greater than the 40% minimum shown by Magness et al. (2006) as necessary for warbler occurrence. The amount of woodland present within 400 meters of woodland east of the ROW on the City of Austin Bliss Spillar property would drop below 80% after clearing of the SH 45SW ROW. This suggests the chance for future occurrence of warblers on this property would drop below 50%. However, golden-cheeked warblers have been found on this property only 14.3% of the time (1 out of 7 surveys), suggesting that the chance for warblers to occur on this property is already well below 50%. Therefore, the reduction in the amount of woodland cover present on the landscape as a result of clearing of the SH 45SW ROW is not expected to alter the frequency at which golden-cheeked warblers occur on City of Austin Water Quality Protection Lands.

It is expected that TxDOT would clear the SH 45SW ROW and initiate construction activities outside of the golden-cheeked warbler survey season. Studies have shown that road construction noise and road noise have no effect on golden-cheeked warbler pairing success, territory placement, or productivity (Lackey et al. 2011, Pruett et al. 2014). Consequently, should a golden-cheeked warbler choose to establish a territory in proximity to the SH 45SW ROW while road construction was underway, or after the road was built and opened for use, the ability of that warbler to attract a mate or successfully raise young is not expected to be impaired as a result of noise and activity associated with construction or use of the road.

For the reasons discussed in this report as summarized above, SWCA believes that the construction and use of SH 45SW will not result in impacts to the golden-cheeked warbler.

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APPENDIX N
TRAFFIC MEMORANDUM

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Technical Memorandum

Introduction

The Texas Department of Transportation (TxDOT) has conducted traffic demand modeling of the 2035 no-build and 2035 build traffic forecast in support of the environmental analysis for the SH45SW new location project for southwest Austin, Texas in Hays and Travis Counties. As shown in **Figure 1**, project limits are from SH45/Mopac to FM 1626 (3.5 miles), just south of Bliss Spillar Road. The project includes two toll lanes in each direction with two new connections, one with SH45/Mopac and another with FM-1626; and slip ramps to serve the north side of Bliss Spillar Road.

Forecasts were developed from an extensive traffic data collection effort (historic and existing counts), video license plate capture, and by applying the Capital Area Metropolitan Planning Organization (CAMPO) travel demand model.

This memorandum focuses on the methodology and results of traffic forecasting for the existing 2013 daily traffic, 2035 no-build daily traffic and 2035 proposed build daily traffic.

Figure 1 – SH45SW Vicinity Map

Existing Traffic Conditions

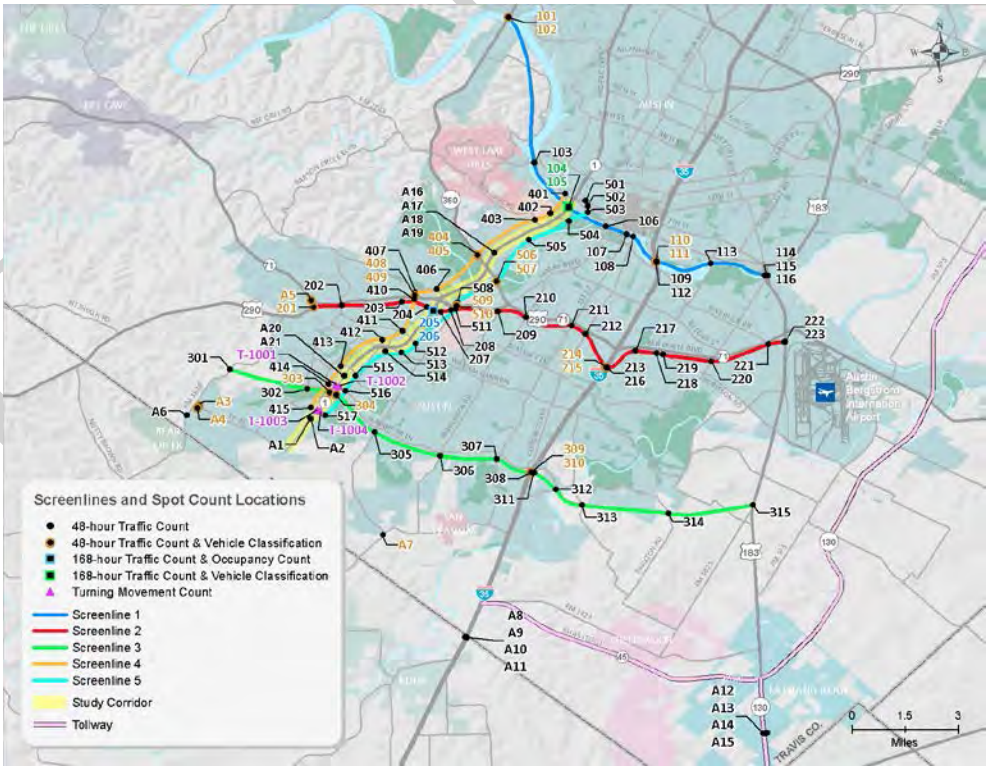
Traffic Data Collection

CTRMA (Central Texas Regional Mobility Authority) conducted an exhaustive traffic data collection program in late 2013. The CTRMA traffic data was provided to TxDOT in December 2013. The traffic data included hourly tube counts, intersection turning movement data, and vehicle classification data. The CTRMA traffic data collection program was developed to collect traffic data for several projects throughout the region. Therefore, only a sub-set of the CTRMA data was used in this analysis. The CTRMA traffic data utilized for this analysis is available in **Appendix A**. In addition, TTI (Texas Transportation Institute) conducted a video license plate capture survey conducted throughout the study area in October 2013. The survey results and the traffic data collected during the survey were provided to TxDOT in December 2013. A summary of key findings, the survey results, and the traffic data collected during the survey are available in **Appendix B**. **Figure 2** provides the locations and type of data collected in 2013 by CTRMA (Central Texas Regional Mobility Authority).

The traffic data and survey were used for three primary purposes:

1. Establish existing traffic characteristics.
2. Establish local traffic flow characteristics, such as distribution, directionality, and temporal distribution along study area corridors.
3. Evaluate and adjust CAMPO TransCAD travel demand model forecasts.

Figure 2 – 2013 Traffic Data Collection



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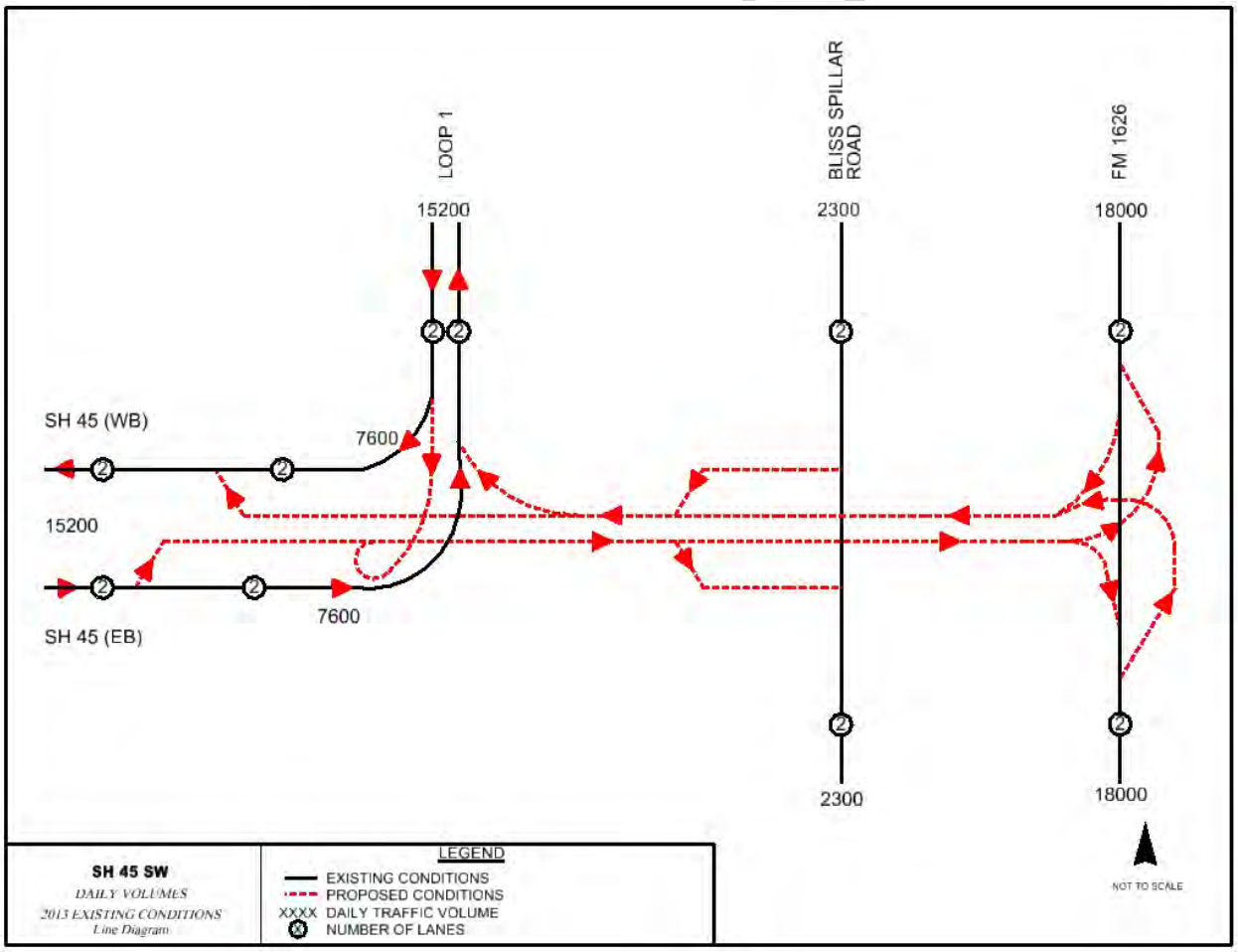
Historical traffic count data was obtained from TxDOT's Transportation Planning & Programming Division. Historical traffic data was used to establish traffic growth trends at key locations within the study area and to provide a reasonableness check against traffic projections.

Base Year 2013 Daily Traffic

Several existing data sets were used in the development of base year 2013 daily traffic volumes. The first data set is TxDOT published daily counts for on-system roadways from years 2002 through 2012. The second dataset includes the latest 2013 traffic count data collected in late fall of 2013. Finally, the 2015 CAMPO model traffic assignment was also evaluated. Because the 2013 data was collected so close to 2014, the 2015 model would more closely represent the base year rather than the 2010 model. These data sets provided sufficient information to estimate the 2013 daily volumes within the corridor study area. **Figure 3** shows the 2013 daily traffic volumes for the study area.

Figure 3: Base Year 2013 Daily Traffic Volumes



Travel Characteristics

K-Factor and Directional Splits were derived from extensive count data on Mopac, SH45, and FM 1626. Based on the observed data Mopac south of Slaughter Lane and SH45 east of FM 1826 has a K-Factor of 10.5% and a directional distribution of 58%-42%. FM 1626 just south of Brodie Lane has a K-Factor of 11% and a directional distribution of 62%-38%.

Truck Percentages

Truck data was available from 2013 vehicle classification counts on SH45 east of FM 1826 and Mopac south of Slaughter Lane. Based on the observed data, truck percentages at these two locations in the study area are slightly under 2%. Truck percentages are based on FHWA Class 6 – Class 13. Pick-ups, Buses, and single unit, 2-axle trucks are not included in the percentage. Based on 2011 vehicle classification data collected just east of Manchaca on FM 1626, the truck percentage was approximately 7.5%. Vehicle classification data at this location did not specify whether or not this truck percentage included pick-ups, buses, and single unit, 2-axle trucks. Based on professional judgment, this percentage likely includes buses and single unit, 2-axle trucks.

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Future Traffic Forecasting

For consistency with local and regional transportation planning efforts, the CAMPO travel demand model was used for developing forecasts for this proposed project. CAMPO is the Capital Area Metropolitan Planning Organization for Bastrop, Caldwell, Hays, Travis, and Williamson Counties in central Texas. The purpose of CAMPO is to coordinate regional transportation planning with counties, cities, the Capital Metropolitan Transportation Authority (Capital Metro), Texas Department of Transportation and other transportation providers in the region and to approve the use of federal transportation funds within the region. One of the main products of CAMPO is the 2035 Regional Transportation Plan (RTP), a plan designed to assess the future needs of the five-county Capital Area region and guide the development of a comprehensive multimodal regional transportation system. The CAMPO travel demand model generates travel demand projections for the years 2015, 2025, and 2035 based on population and employment projections. Currently, SH45 is identified in the CAMPO 2035 Regional Transportation Plan as a four-lane divided tollway between Mopac and FM 1626.

The CAMPO model was provided to TxDOT for use in developing the 2035 forecasts for the SH45SW proposed toll road between Mopac/SH45 and FM 1626. The first step in developing future traffic volumes is to evaluate the performance of the model within the study area. This is typically done by comparing observed traffic counts against modeled traffic counts for the same time period. As indicated earlier, the 2013 traffic counts were collected in late fall of 2013, approximately 13 months from year 2015. Therefore, model performance for the study area will be based on comparisons between the 2013 observed counts and 2015 modeled counts. Consideration was given to the small difference in points of time between the observed and modeled counts where appropriate. **Table 1** provides the location number and description of the locations for observed and modeled count comparisons. **Figure 4** provides a visual of those locations described in **Table 1**.

Table 1: Study area Count Locations for Observed vs. Modeled Count Comparisons

Location ID	Location Description
1	FM 1826, south of SH45
2	SH45, east of FM 1826
3	FM 1826, between Lewis Mountain Road and Slaughter Lane
4	Escarpment Blvd, south of Slaughter Lane
5	Mopac, north of SH45 and south of La Crosse Ave.
6	La Crosse Ave., east of Mopac
7	Mopac, south of Slaughter Lane
8	Slaughter Lane, west of Mopac
9	Mopac, north of Slaughter Lane
10	Slaughter Lane, east of Mopac
11	Brodie Lane, south of Slaughter Lane
12	FM 1626, south of Brodie Lane
13	Manchaca Road, just south of Slaughter
14	IH-35, south of Slaughter Lane
Blue Shading Indicates Screen Line Location	

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Figure 4: Study area Count Locations for Observed vs. Modeled Count Comparisons

Table 2 below provides the results of the 2015 traffic assignment and the comparison with the 2013 traffic counts.

Table 2: Counts and Screen Line Comparison			
Location	**2015 Modeled Volumes**	**2013 Counts**	**Percent Difference**
1	11,400	5,915	-93%
2	10,926	16,250	33%
3 (Screen line)	2,868	6,222	54%
4 (Screen line)	25,843	16,638	-55%
5	217	14,866	99%
6	4,085	2,860	-43%
7 (Screen line)	10,996	23,385	53%
8	48,678	29,309	-66%
9	42,248	46,191	9%
10	32,094	38,329	16%
11 (Screen line)	32,095	24,993	-28%
12	26,876	18,007	-49%
13 (Screen line)	12,103	28,000	57%
14 (Screen line)	139,897	111,752	-25%
Average Difference of Absolute Value = 49%			

The first initial 2015 model assignment results shows a significant difference between modeled counts and observed counts, even when considering the approximately one year difference between the two time periods and average absolute difference of 49%. Recall that in **Figure 4**, a screen line was shown across the study area from FM 1826 to IH-35. A Screen line analysis provides a check of total demand crossing into and out of the study area. In addition to comparing traffic counts throughout the study area, total screen line volumes should also be consistent. Shown in **Table 3**, the screen line analysis of the study area shows that the total screen line volumes are within 6% of each other, less than 10% which is an acceptable margin.

Table 3: Screen Line Comparison			
Screen Line Locations	**2015 Modeled Volumes**	**2013 Counts**	**Percent Difference**
3	2,868	6,222	54%
4	25,843	16,638	-55%
7	10,996	23,385	53%
11	32,095	24,993	-28%
13	12,103	28,000	57%
14	139,897	111,752	-25%
Total Screen Line Volume	223,802	210,990	**6%**
Average Difference of Absolute Value = 45%			

It is important to note that the total screen line volumes are within 6% of each other while having an approximately 13 month time difference. The 2015 total screen line volume is approximately 13,000

vehicles higher than the late 2013 total screen line volume. A year of traffic growth ranging from 3% to 5% a year from 2014 to 2015 would bring the total screen line volumes even closer. This fact provides assurance that the 2015 model is at least representing the 2013 demand conditions across the study area screen line. What is important to gleam from the screen line analysis is the distribution of that demand across the six facilities. The screen line data does show is that the distribution of demand across the facilities is not matching the observed distribution patterns.

In a regional travel demand model, it is common that screen line distributions between modeled data and observed data not be similar within a smaller subarea of the network. There are several reasons for this but mainly it is due to lack of network in the sub area (or study area) and the access assumptions from Traffic Analysis Zones (TAZs) to the network. TAZs are represented as a "centroid" node in the model network and are where the model generated trips begin and end in the model network. TAZs are connected to the network via a "centroid connector"

Before the 2035 forecast can be developed, the base year model (2015) must be refined to reflect the observed traffic counts, observed screen line distributions, and observed total screen line volumes. The next section describes the process of model refinement and the results of that refinement.

Model Sub-area Refinement

Model sub-area refinement is the process of "fine-tuning" the network and trip tables within the sub-area or area of analysis (study area) with the hope of better matching observed conditions without sacrificing the integrity of the regionally adopted travel demand model. TAZs correlate to the model trip tables. The trip table contains the number of trips into and out of each TAZ in the model. The CAMPO model has 1462 TAZs. TAZs in a regional travel demand model can encompass large geographic areas with diverse development patterns and diverse land uses. In many cases, the local connector street grid is omitted in regional models and are replaced by centroid connectors (defined earlier) with direct connections to higher functionally classified facilities. In many cases this condition contributes to the poor screen line distributions.

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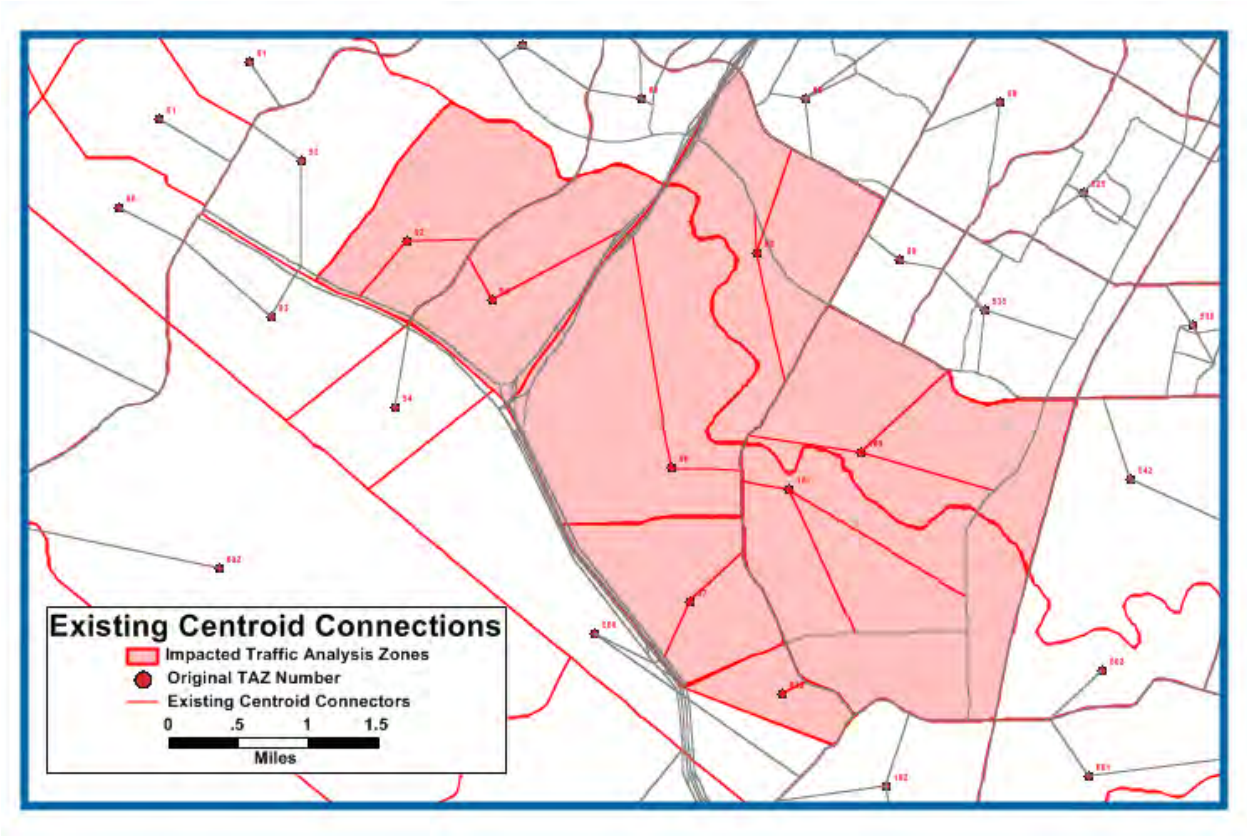
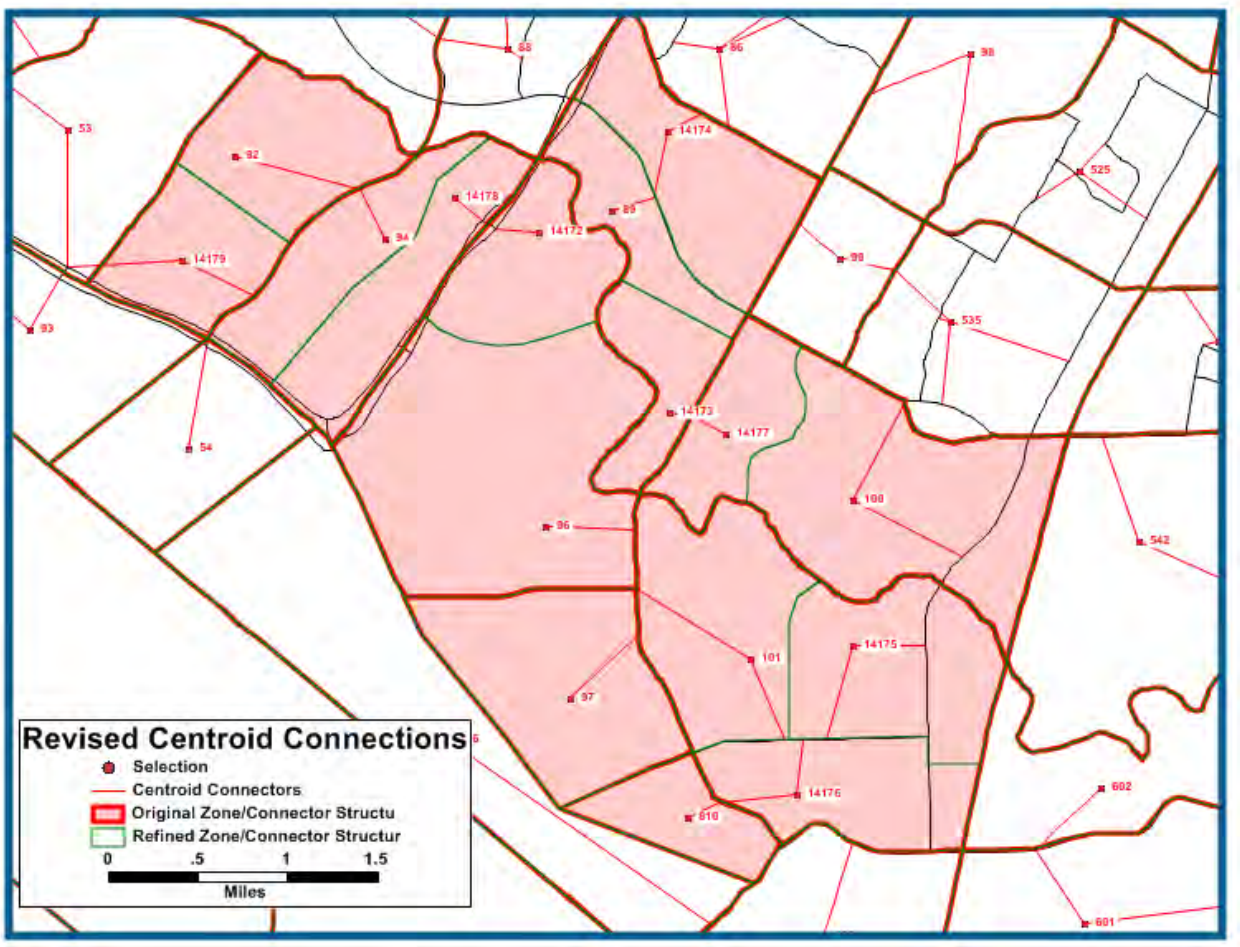
Figure 5 shows the current TAZ structure, TAZ number, and centroid connector locations to the network.

Figure 5: Existing 2015 TAZ and Centroid Connectors for Study



The current 2015 TAZ structure for the study area contains eight (8) TAZs with 18 centroid connectors providing access to the network. Using aerial photography and field observations, many of these connectors provide access to facilities at locations where it is physically unable for vehicles to enter the network. To correct this issue, TAZs are split (called sub-zones) and given realistic connection sites to the network. The associated trip table is then disaggregated to match the new sub-zone system, shown in **Figure 6**.

Figure 6: Refined 2015 TAZ and Centroid Connectors for Study



The results of the sub-area refinement provided for a total of 16 TAZs and 4 additional centroid connectors. This refinement maintains the original model zone structure but allows the modeler more ability to control where trips access the local network. Mentioned earlier, the next step is to expand the 2015 trip table to include the new TAZs and assign them their respective trips based on the original 2015 model TAZ trip total.

Using aerial photography and field observations, the 2015 trip table was disaggregated based on the expansion factors provided in **Table 4**.

Table 4: Refined TAZ Expansion Factors		
TAZ	**Refined TAZ**	**Trip Table Expansion Factor**
89	89	0.35
89	14173	0.25
89	14174	0.4
92	92	0.6
92	14179	0.4
94	94	0.65
94	14178	0.35
96	96	0.77
96	14172	0.23
100	100	0.8
100	14177	0.2
101	101	0.4
101	14175	0.37
101	14176	0.23

In addition to refining the TAZ connections to the network, network attributes within the refined sub-area were reviewed. In large regional models, network (model link) attributes are populated by look-up tables in an automated process. For instance, network speeds and capacities are assigned by model area type and model classification of roadways. The CAMPO model has 5 Area types; 1) Central Business District (CBD), 2) Urban Intense, 3) Urban Residential, 4) Suburban Residential, and 5) Rural. The CAMPO model also has 13 roadway classifications. If a road falls on the boundary of an urban residential and suburban residential area type, it will get assigned the attributes of one or the other, regardless of how the roadway actually performs or is utilized. This can be a difference in assigned speeds between 5 to as much as 30 mph and a roadway capacity difference of 1,000 to 10,000 vehicles per lane. In a model that minimizes travel time and utilizes a capacity constrained assignment, these differences can contribute to a poor screen line distribution match.

Figure 7 shows the highlighted roadways with their model assigned speeds that were adjusted within the refined study area. Based on the observed traffic counts, the 2015 model was over-assigning trips to Escarpment Blvd, Slaughter Lane, and Brodie vs. SH45 and Mopac. A review of the speed survey data collected between 2011 and 2013, show that model input speeds were too high for Escarpment Blvd., Slaughter Lane, and Brodie Lane; while speeds on SH45 and S. Mopac were too low.

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Figure 7: 2015 Links Reviewed for Refined Network Study Area

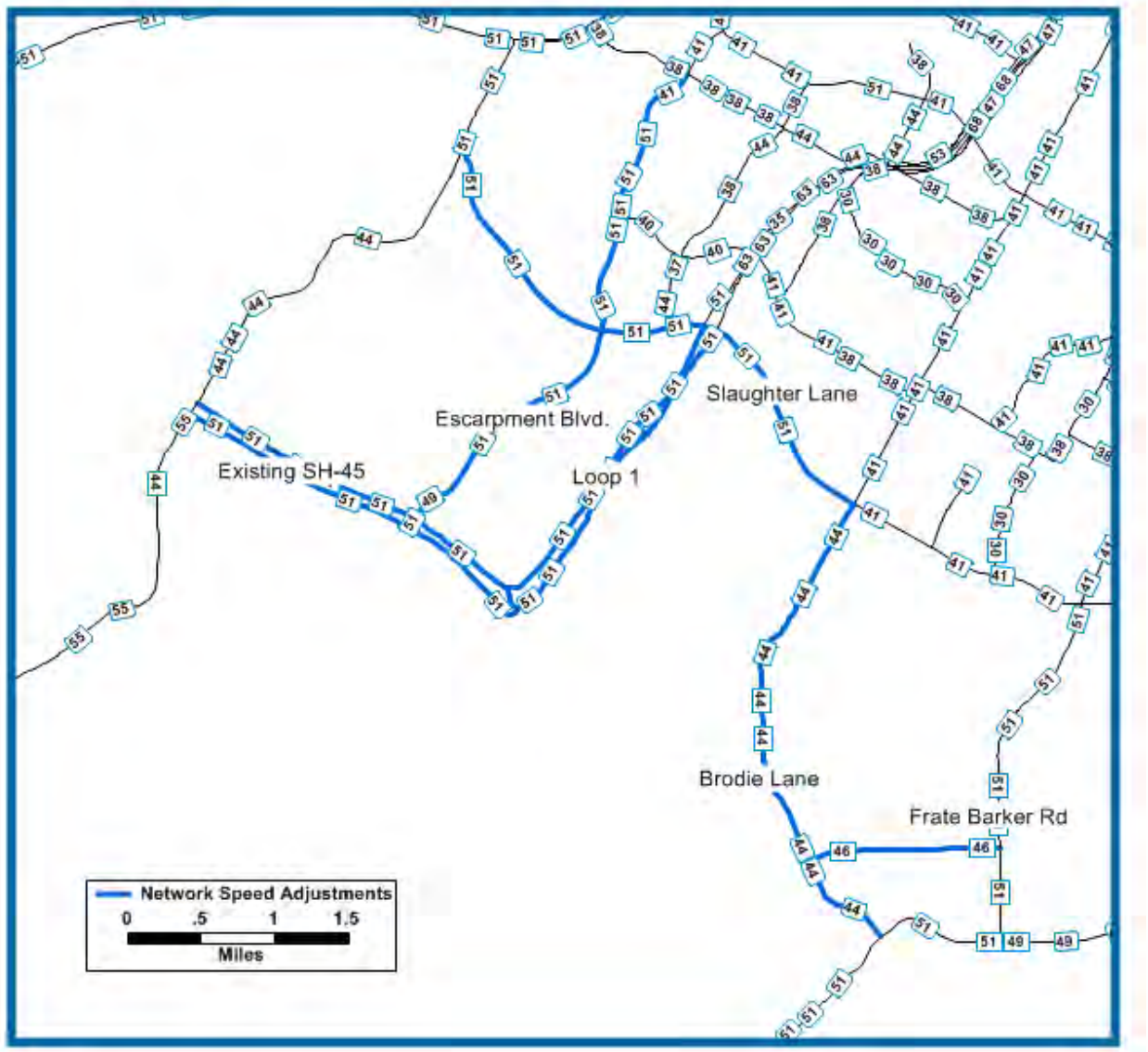

Table 5 below shows the existing network attributes for the highlighted facilities in **Figure 7** above.

Table 5: Existing 2015 Sub-Area Network Attributes				
Roadway	Road Class	Area Type	Speed	Lane Capacity
Brodie Lane	Minor Arterial	Suburban Residential	44	9,900
Slaughter Lane	Principal Arterial	Suburban Residential	51	7,000
Escarpment Blvd.	Principal Arterial	Suburban Residential	51	14,000
SH45	Principal Arterial	Suburban Residential	51	7,000
Mopac	Principal Arterial	Suburban Residential	51	7,000

Figure 8 below, shows the adjusted speeds based on the CAMPO 2005 Speed & Capacity Table dated February 2010. Escarpment Blvd. was reduced from 51 mph to 33mph, Brodie Lane was reduced from 44 mph to 33 mph, and Slaughter Lane was reduced from 51mph to 41mph.

Figure 8: 2015 Adjusted Speeds for Refined Network Study Area

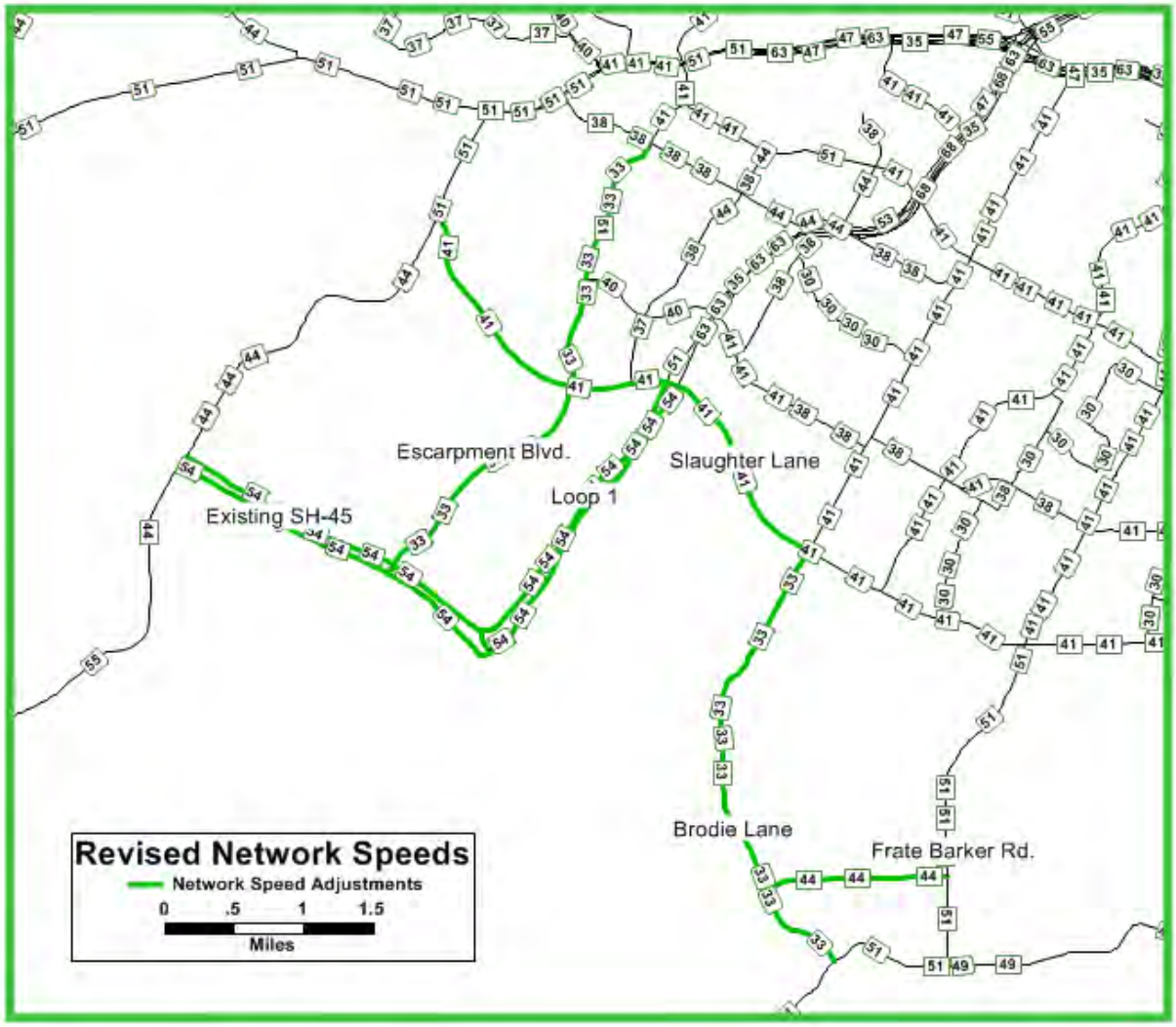

Table 6 below provides the detail of the networks attribute changes for the links discussed and highlighted above in **Figure 8**.

Table 6: Revised 2015 Sub-Area Network Attributes				
Roadway	**Road Class**	**Area Type**	**Speed**	**Lane Capacity**
Brodie Lane	Collector	Urban Residential	33	5,200
Slaughter Lane	Principal Arterial	Urban Residential	41	8,000
Escarpment Blvd.	Collector	Urban Residential	33	5,200
SH45	Expressway	Suburban Residential	54	9,200
Mopac	Expressway	Suburban Residential	55	9,200

Model Refinement Sub-area Screen Line Results

Table 7 below provides the results of the 2015 traffic assignment and the comparison with the 2013 traffic counts.

Table 7: Counts and Screen line Comparison			
Location	**Refined 2015 Modeled Volumes**	**2013 Counts**	**Percent Difference**
1	13,616	5,915	-130%
2	13,512	16,250	17%
3 (Screen line)	3,400	6,222	45%
4 (Screen line)	15,077	16,638	9%
5	16,821	14,866	-13%
6	2,040	2,860	29%
7 (Screen line)	21,923	23,385	6%
8	35,373	29,309	-21%
9	41,187	46,191	11%
10	23,061	38,329	40%
11 (Screen line)	19,589	24,993	22%
12	23,017	18,007	-28%
13 (Screen line)	26,039	28,000	7%
14(Screen line)	139,531	111,752	-25%
Average Difference of Absolute Value = 29%			

The first initial 2015 model assignment results showed a significant difference between modeled counts and observed counts, even when considering the approximately one year difference between the two time periods and an average absolute difference of 49%. After the network and zonal refinements, the average absolute difference was decreased by almost 41%, down to 29%.

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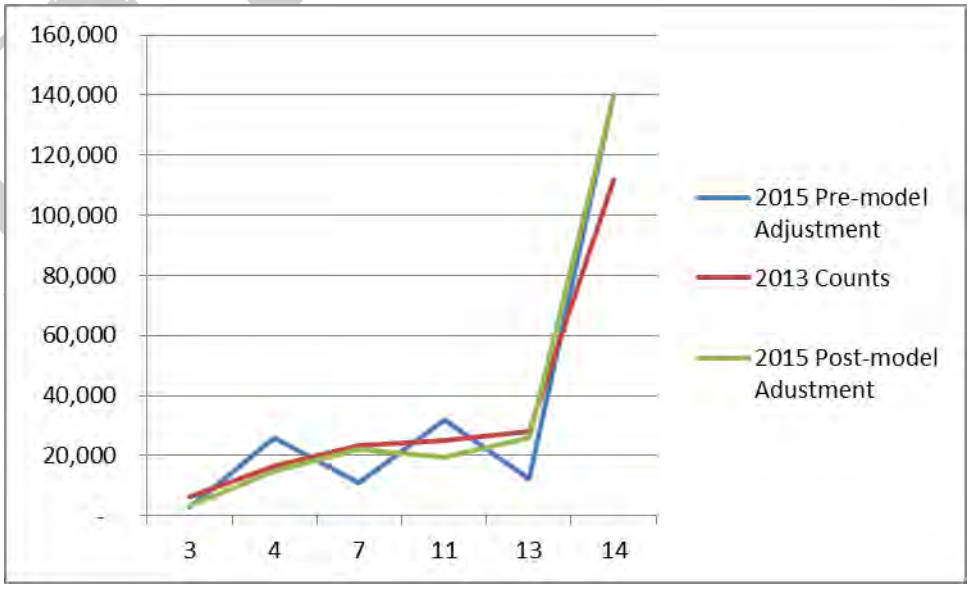
Shown in **Table 8**, the screen line analysis from the refined 2015 model study area shows that the total screen line volumes are within 7% of each other, an acceptable margin.

Table 8: Counts and Screenline Results for Refined 2015 Model			
Location	**2015 Modeled Volumes**	**2013 Counts**	**Percent Difference**
3	3,400	6,222	45%
4	15,077	16,638	9%
7	21,923	23,385	6%
11	19,589	24,993	22%
13	26,039	28,000	7%
14	139,531	111,752	-25%
Total Screen Line Volume	225,559	210,990	**7%**
Average Difference of Absolute Value = 19%			

It is important to note that the total screen line volumes are within 7% of each other while having an approximately 13 month time difference. The 2015 total screen line volume is approximately 14,500 vehicles higher than the late 2013 total screen line volume. A year of traffic growth ranging from 3% to 5% a year from 2014 to 2015 would bring the total screen line volumes even closer. This fact provides assurance that the 2015 model is representing the 2013 demand conditions across the study area screen line. After the network and zonal refinements, the average absolute difference for the screen line was decreased from 45% down to 19%, a 58% improvement. The screen line data does show that the distribution of demand across the facilities is more closely matching the observed distribution patterns with the refinements. The graph below illustrates an improved fit to the observed screen line location counts after the model sub-area refinement. The R^2 value from the linear regression of the 2013 screen line counts equals .61, the R^2 value from the linear regression of the pre-model adjustment equals .47, and the R^2 value from the linear regression of the post-model adjustments equals .57.

Screen Line Regression Comparison



Traffic Forecasting for Future No Project and Recommended Alternative

The model refinements developed to calibrate the 2015 model were incorporated into the 2035 model. The capacity expansion project was included in the CAMPO Model network and traffic assignments were developed for both the no-build and build conditions for 2035.

Network Assumptions

Existing and Committed Roadway Improvements

Several existing and committed roadway improvements to the existing transportation system were identified as part of the future 2035 no-build and build network models. These projects were already included in the future year 2035 model network provided by CAMPO.

There are several relevant improvements related to the study area facilities for 2035:

1. US 290 @ Mopac Interchange - Construct direct connects from NB Mopac to EB US 290 and WB US 290 to SB Mopac
2. Mopac Managed Lanes (Phase 1) – Construct one managed lane in each direction from Cesar Chavez to north of Slaughter Lane
3. Mopac Grade Separations - @ Slaughter and Mopac and @ La Crosse and Mopac
4. FM 1626 – Widen 2-lane arterial to 4-lane major divided arterial from Bliss Spillar Road to Manchaca Road
5. Manchaca Road - Widen 2-lane to 4-lane major divided arterial from FM 1626 to Ravenscroft Road.
6. FM 1626 – Widen to 4-lane divided highway from RM 967 to FM 2770
7. FM 1626 – Widen to 4-lane divided highway from Brodie Lane to RM 967

Toll Assumptions

Toll parameter assumptions contained in the 2035 CAMPO travel demand model are shown below in **Table 9**. In order to maintain the integrity of the regionally adopted model, these toll assumptions were applied to this forecast. Changes to these values can have a significant impact to toll diversions.

Table 9: 2035 Toll Parameters for SH45SW

2035 Toll Parameters for SH45SW	Passenger Car	Truck
Value of Time (hour)	$ 12.00	$ 42.00
Operating Cost (per mile)	$ 0.17	$ 0.57
Toll Cost (per mile)	$ 0.33	$ 1.14

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Traffic Assignment Assumptions

The 2035 CAMPO five-county assignment of 24-hour trips to the 2035 network was performed by the Multi-Modal Multi-Class User (MMA) Equilibrium Capacity Restraint Assignment residing within the TransCAD package. MMA Equilibrium assignment algorithms weigh the volume dependence of travel times among numerous routes which results in the calculation of link volumes and travel times that are mutually consistent. The program iterates between assigning volumes and recalculating loaded travel times such that a state of equilibrium is reached. The key behavioral assumption is that in the equilibrium state, no traveler can improve their travel time by changing to another route. The MMA portion allows the program to assign multiple classes during the assignment run. For the base year model, those classes are: SOV, HOV2, HOV3+, Auto External and Others, and Truck External and Others. The 2035 equilibrium assignments were run using a convergence factor of 0.0001 for a maximum number of iterations of 100.

Bureau of Public Roads (BPR Curve) Adjustments

The equilibrium traffic assignment procedure is dependent upon the BPR volume-delay function to estimate travel speeds under congested conditions. The function used for the TransCAD CAMPO model is $T(f) = T(0) * [1+\alpha*(v/c)^\beta]$ where $\alpha = 0.15$ and $\beta = 4.0$. These parameters cause the speeds to begin to decay at about the time that assigned volumes reach 85% of capacity. Because so many of the base year network links were experiencing volumes in excess of LOS E capacities and observed counts, the resulting 2005 assignments were over assigned because of the diversions from the BPR curves. To improve assignment results, CAMPO made the decision to adjust the delay function by roadway functional class (FC). This result of this process is as follows:

Alpha	Beta	Functional Classification
0.15	4.00	FC's 1 – 5 and 10 – 12
1.00	5.30	FC's 6 – 9

In order to maintain the integrity of the regionally adopted travel demand model, CAMPO's adjustment to the BRP curve was included in the traffic assignment for forecast development.

No-build Forecast

Model Assignment Results and Growth Rate Assumptions

FM 1626 serves as the eastern connection to the proposed SH45SW facility. FM 1626 is primarily a north-south route serving the cities of Kyle and Buda, and portions of Hays County. FM 1626 parallels IH-35 to the west and provides access from Hays County to southwest Travis County. FM 1626 is proposed to be expanded from a 2-lane facility to a 4-lane divided highway from FM 2770 just north of Kyle to Manchaca Road in Travis County.

Historic traffic data and recently collected traffic data for FM 1626 was reviewed and compared to model outputs. Average Annual Growth Rates (AAGR) were calculated for 10 year and 5 year increments. Historic traffic counts were not available for FM 1626 just south of Brodie Lane. However, historic traffic counts were available just north and south of this location – (west of FM 2304 and north of the

Travis/Hays County line). **Table 10** provides the historical trends, 2013 estimated daily volume, and the unadjusted (raw) model output for 2015, 2035 no build, and 2035 build conditions. The highlighted row in Table 10 is the approximate location on FM 1626 where the proposed SH45SW will tie into FM 1626. The only location where observed 2013 traffic count data was available was the South of Brodie Lane location. The 2013 estimated count data for the other locations was calculated by applying the 5-year AAGR to the 2012 count.

Table 10: FM 1626 Traffic Volumes, Growth Rates and Model Output

County	Location	Historic Data						Unadjusted Model Counts		
		2002	2007	2012	10 year AAGR	5 year AAGR	Estimated 2013	2015	2035 No build	2035 Build
Travis	West of FM 2304	11,500	12,700	13,000	1.23%	0.47%	13,061	17,578	38,516	18,030
Travis	South of Brodie Ln.	N/A	N/A	N/A	N/A	N/A	*18,000	23,017	42,231	22,379
Travis	North of Hays C/L	11,300	14,100	14,300	2.38%	0.28%	14,340	22,339	42,446	53,869
Hays	North of RM 967	7,200	8,000	11,900	5.15%	8.27%	12,884	14,074	30,589	42,439
Hays	South of RM 967	5,400	6,500	13,300	9.43%	15.40%	15,348	18,276	39,928	47,933

*Observed traffic count

Comparisons between historic and model growth rates were developed based on the data contained in **Table 10**. Growth rates for the 5 year trend, 2013 to 2015, and model growth rate from 2015 to 2035 no build condition are provided below in **Table 11**.

Table 11: FM 1626 No build Forecast Growth Rates

County	Location	Forecast Growth Rate Comparison			Adjusted Forecast
		2007 - 2012 AAGR	2013 - 2015 AAGR	2015 - 2035 No build Model AAGR	2035 No Build
Travis	0.1 miles west of FM 2304	0.47%	22%	4.00%	30,954
Travis	**0.1 miles south of Brodie Lane**	**N/A**	**18%**	**3.08%**	**35,000**
Travis	0.05 miles north of Hays County Line	0.28%	34%	3.26%	29,054
Hays	0.35 miles north of RM 967	8.27%	6%	3.96%	30,262
Hays	0.2 miles south of RM 967	15.40%	12%	3.98%	36,256

The 2015 model assignment is significantly over-forecasting demand on FM 1626 in Travis County. During the last five years at this location, traffic has increased at an annual rate of less than .5% per year. The 2015 model assignment shows an AAGR of traffic on FM 1626 in Travis County to increase at an annual rate between 18% and 34% between 2013 and 2015. To adjust for this over estimation, the 20 year model growth rate of 3.08% per year was applied to the observed 2013 traffic count. The result is a

reduction from the unadjusted 2035 daily forecast of 42, 231 to 35,000 vehicles per day, as shown in **Table 11** under the *Adjusted Forecast* column. Mopac south of La Crosse and Existing SH45 west of Mopac serve as the western connection to the proposed SH45SW facility. These facilities are 4-lane divided highways with at-grade intersections with local streets. SH45 has a posted speed of 70 mph and Mopac south of La Crosse has a posted speed of 65mph. Mopac is planned for intersection upgrades for La Crosse and Slaughter Lane. These intersection upgrades will provide for controlled access at La Cross and Slaughter Lane and eliminates the at-grade crossings.

Historic traffic data and recently collected traffic data for Mopac and SH45 was reviewed and compared to model outputs. Average Annual Growth Rates (AAGR) were calculated for 10 year, 5 year, and 4 year increments. Historic traffic counts were not available for Mopac south of La Crosse and for SH45 west of Mopac. However, historic traffic counts were available west and north of those locations. **Table 12** below, provides the historical trends, 2013 observed daily volumes, and the unadjusted (raw) model output for 2015, 2035 no build, and 2035 build conditions. The highlighted rows in **Table 12** are the approximate locations on Mopac and SH45 where the proposed SH45SW will tie into from FM 1626.

Table 12: Mopac and SH45 Traffic Volumes, Growth Rates and Model Output

County	Location	Historic Data								Unadjusted Model Counts		
		2002	2007	2008	2012	10 year AAGR	5 year AAGR	4 year AAGR	Observed 2013	2015	2035 No build	2035 Build
Travis	Mopac, s. of Slaughter	12,300	24,000	19,700	21,000	5.49%	-2.64%	1.61%	23,385	21,923	21,086	46,817
Travis	Mopac, s. of La Crosse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14,866	16,821	15,849	43,917
Travis	SH45, w. of Mopac	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14,866	16,821	15,849	13,471
Travis	SH45, e. of RM1826	5,000	5,600	12,200	13,500	10.44%	19.24%	2.56%	16,250	13,512	12,823	12,045

Comparisons between historic and model growth rates were developed based on the data contained in **Table 12**. Growth rates for the 5 year and 4 year trend, 2013 to 2015 trend, and model growth rate from 2015 to 2035 no build condition are provided below in **Table 13**.

The 2015 model assignment is under-forecasting demand on Mopac south of Slaughter and on SH45 east of FM 1826 in Travis County. During the last four years at these locations, traffic has increased at an annual rate of 1.61% and 2.56% per year, respectively. The 2015 model assignment shows an AAGR of traffic on Mopac south of Slaughter and SH45 east of FM 1826 in Travis County to decrease at an annual rate between 3% and 9% between 2013 and 2015. Furthermore, 20 year average annual growth rate from the model also shows negative growth along this corridor.

Table 13: Mopac & SH45 No build Forecast Growth Rates

County	Location	Forecast Growth Rate Comparison				2035 No Build Adjusted Forecast
		2007 - 2012 AAGR	2008 - 2012 AAGR	2013 - 2015 AAGR	2015 - 2035 No Build Model AAGR	
Travis	Mopac, s. of Slaughter	-2.64%	1.61%	-3%	-0.19%	**33,234**
Travis	Mopac, s. of La Crosse	N/A	N/A	6%	-0.30%	**26,600**
Travis	SH45, w. of Mopac	N/A	N/A	6%	-0.30%	**26,600**
Travis	SH45, e. of FM1826	19.24%	**2.56%**	-9%	-0.26%	**23,563**

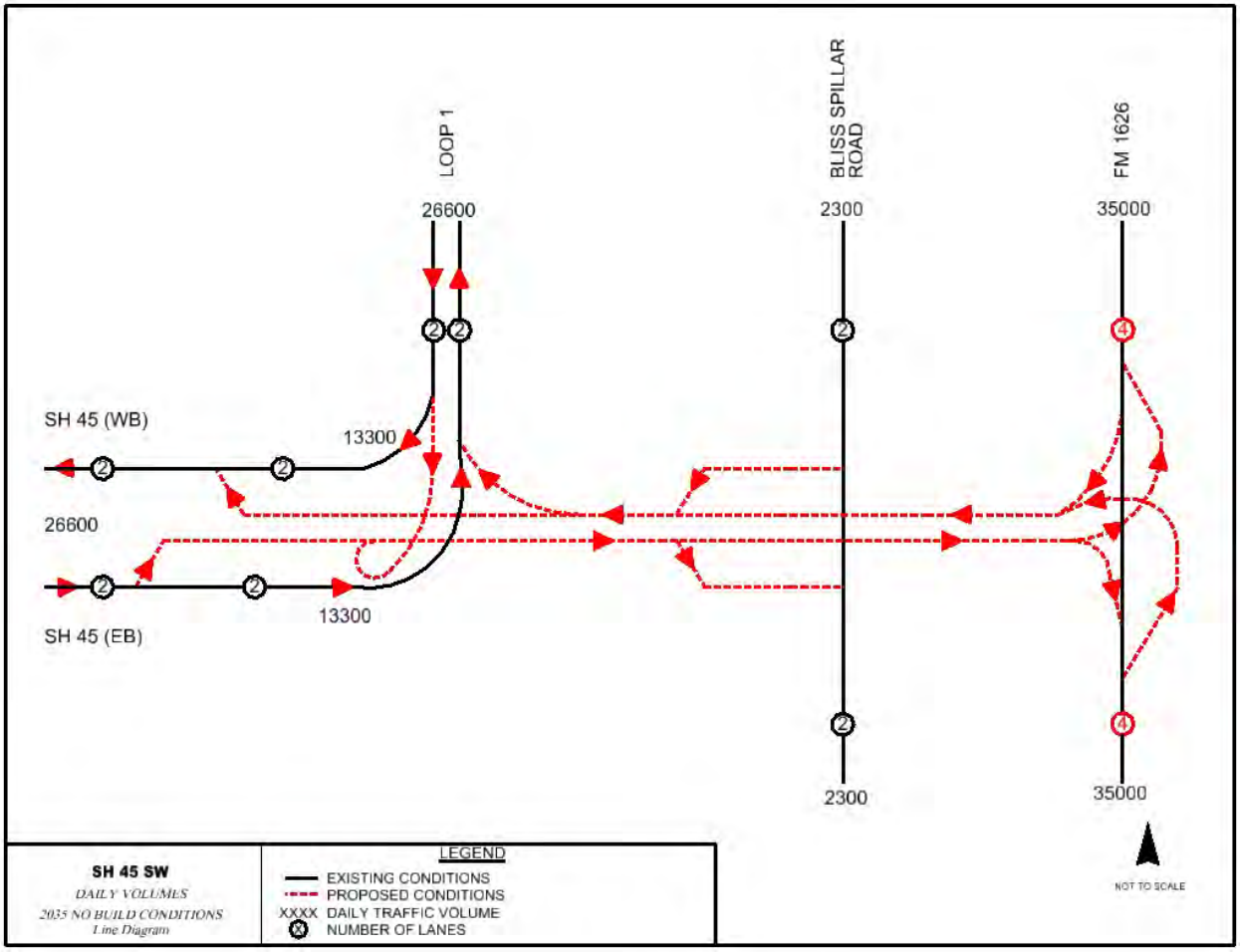
A further review of the demographics in the model study area show that significant development currently underway are not included in the model forecast demographics. Two large scale residential developments are currently being developed just south of SH45 and west of Mopac. These residential areas include Avana and Grey Rock Ridge. A field visit to these developments was conducted. The findings from the Avana site visit show that Escarpment Blvd has been extended south of SH45 and serves a large newly constructed local street network. Within this recently constructed network, several hundred acres are being cleared and sub-divided. Similar development patterns are also underway at Grey Rock Ridge. These two developing residential areas could potentially contain anywhere from 2,000 to 4,000 additional houses upon build out.

To adjust for this under estimation, the 4 year growth rate of 2.56% per year was applied to the observed 2013 traffic counts. The result is an increase from the unadjusted 2035 daily forecast of 15,849 to 26,600 vehicles per day, as shown in **Table 13** under the *2035 No Build Adjusted Forecast* column.

Bliss Spillar Road serves a small residential neighborhood and provides access to FM 1626. Demographics remain constant in the model from 2015 to 2035.

Figure 9 shows number of lanes and forecast daily traffic volumes for the 2035 no-build condition.

Figure 9: Line Diagram and Forecast Daily Traffic Volumes for 2035 No-build Condition



Build Forecast

The forecast for FM 1626 Build option was developed by calculating the percent difference between the 2035 model assignment for the build option and no-build options and applying the difference to the 2035 no-build forecast developed in the previous section. **Table 14** shows the 26% percent increase in traffic on FM-1626 just south of the proposed connection with the proposed SH45 facility.

Table 14: FM 1626 Model Diversion for Build Scenario

County	Location	2035 No build	2035 Build	Model Diversion
Travis	0.1 miles west of FM 2304	38,516	18,030	-53%
Travis	0.1 miles south of Brodie Lane	42,231	22,379	-47%
Travis	**0.05 miles north of Hays County Line**	**42,446**	**53,869**	26%
Hays	0.35 miles north of RM 967	30,589	42,439	39%
Hays	0.2 miles south of RM 967	39,928	47,933	20%

Table 15 below provides a summary of the 2035 No-build and 2035 Build scenarios for FM 1626 in the study area.

Table 15: FM 1626 Adjusted Build Forecast

County	Location	2035 No Build Adjusted Forecast	2035 Build Model Diversion	2035 Adjusted Build Forecast
Travis	**South of Bliss Spillar Road**	**35,000**	**26% increase**	**44,200**
Travis	**North of Prop. SH45SW**	**35,000**	**N/A**	**24,800**

The 2035 forecast for Mopac and SH45 Build option was developed by calculating the percent difference between the 2035 model assignment for the build option and no-build options and applying the difference to the 2035 no-build forecast developed in the previous section. **Table 16** shows an increase in traffic on Mopac north of proposed SH45SW and a decrease of traffic on SH45, west of proposed SH45SW.

Table 16: Mopac & SH45 Model Diversion for Build Scenario

County	Location	2035 No build	2035 Build	Model Diversion
Travis	**Mopac, 0.1 miles south of La Crosse**	**26,600**	**43,917**	**66%**
Travis	**SH45, west of Mopac**	**15,849**	**13,471**	**-15%**

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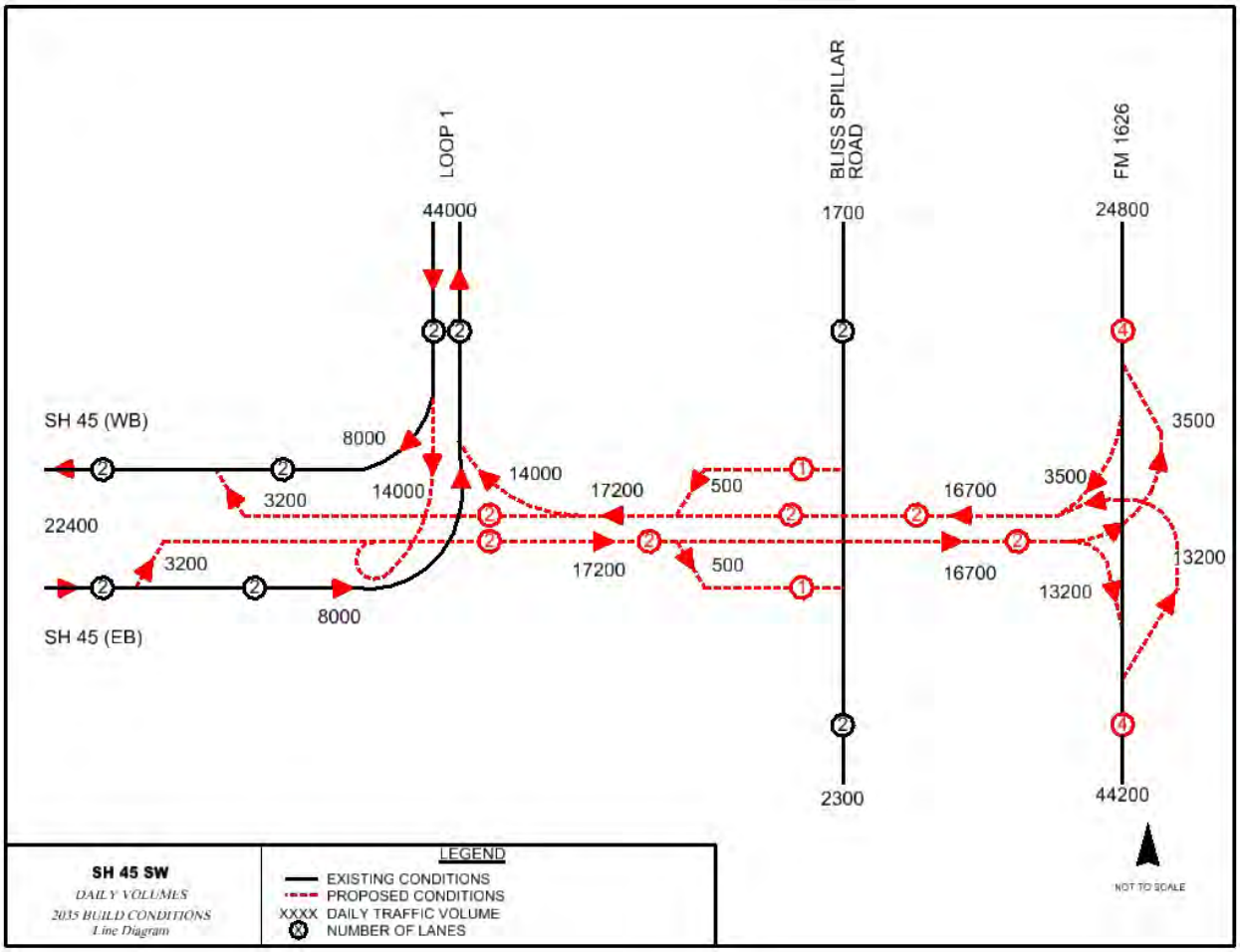
Table 17 below provides a summary of the 2035 No-build and 2035 Build scenarios for Mopac and SH45 in the study area.

Table 17: Mopac & SH45 Adjusted Build Forecast				
County	**Location**	**2035 No Build Adjusted Forecast**	**2035 Build Model Diversion**	**2035 Adjusted Build Forecast**
Travis	Mopac south of La Crosse Ave.	26,600	1.66 Factor	44,000
Travis	SH45, west of Mopac	26,600	.85 Factor	22,400

2035 daily forecast volumes for the proposed SH45SWwere taken from the 2035 demand model and balanced to the 2035 forecast build volumes described in the above sections. The resulting forecast for SH45SW is between 33, 400 and 34,400 vehicles per day. **Figure 10** shows number of lanes and forecast daily traffic volumes for the 2035 build condition.

Figure 10: Line Diagram and Daily Traffic Volumes for 2035 Tolled Build Condition



Conclusion

This memorandum provides an overview of the data collection efforts, data analysis and the traffic forecasting methodology used to develop traffic forecasts for the SH45SW new location project.

The memo also provided existing (2013) and future year (2035) daily traffic forecasts for various facilities within the study area including general purpose lanes, tolled lanes, ramps and local roads for the No Project and Build Tolled scenario.

Summary statistics for the study area network, as defined by the highlighted network shown below in **Figure 11**, are provided for in **Table 18**.

Figure 11: Study Area Network

Vehicle miles of travel (VMT), vehicle hours of travel (VHT), and study area speeds are summarized below in **Table 18**. The proposed project increases VMT by 15% over the no build option. This is due to the diversion of traffic from lower functionally classified roadways to the expressways of SH45, proposed SH45SW, and Mopac due to their available capacity and higher speeds. VHT increases by 11% within the study area but provides an overall increase in average area-wide speeds of 4% over the no-build.

Table 18: 2035 Study Area Results

Scenario	VMT	VHT	Average Study Area Speed
2035 No Build	776,736	18,915	41.06
2035 Build	893,801	20,924	42.72
Percent Difference	15%	11%	4%

Appendix A – CTRMA Traffic Data

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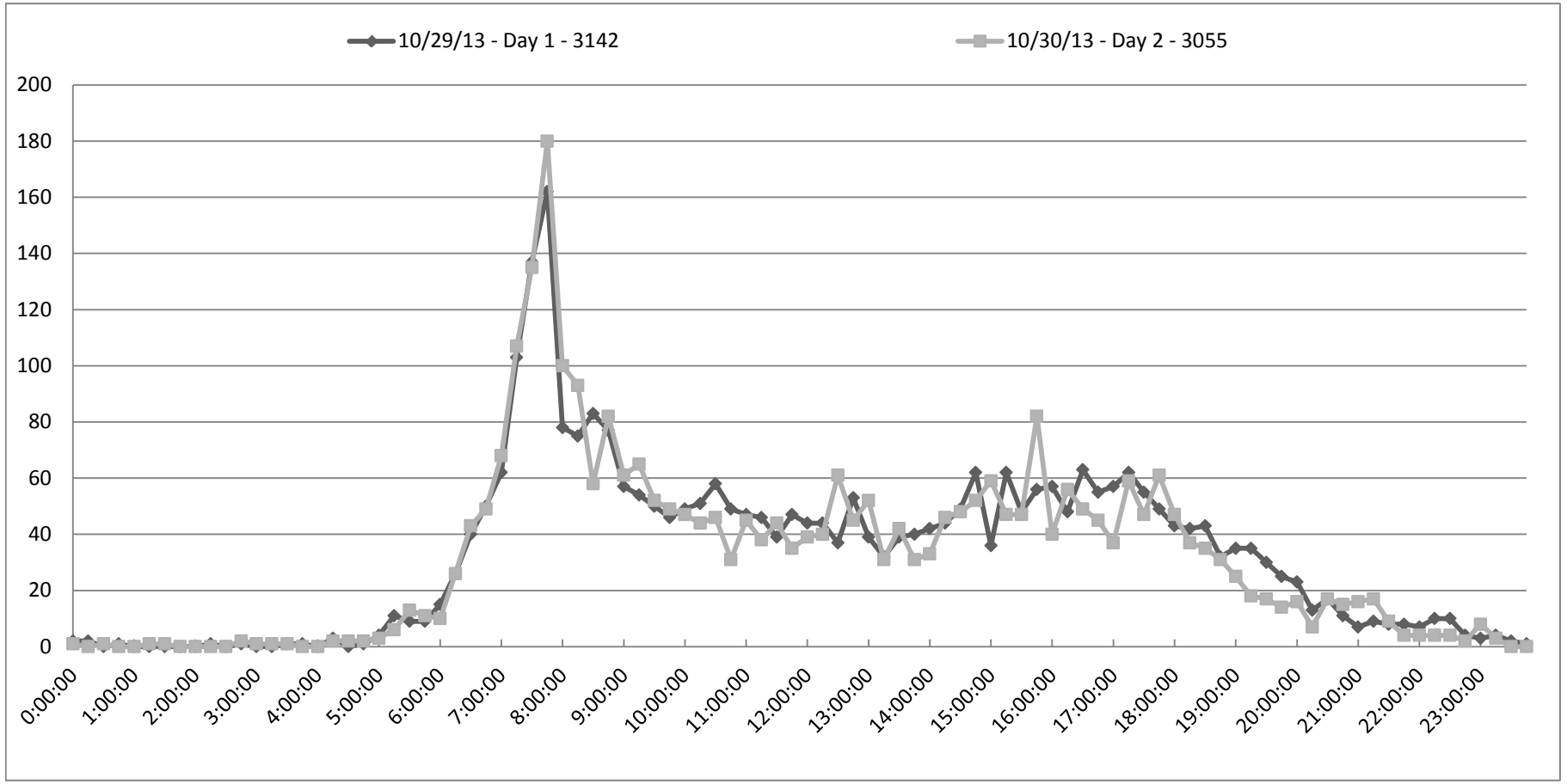
RM 1826 North of Lewis Mountain Drive

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	5	0	2	2	4	33	131	464	313	207	207	179
10/30/13 - Day 2	2	0	5	4	24	90	359	431	260	186	158	175
Diff	3	0	-3	-2	-20	-57	-228	33	53	21	49	4
% of Diff	60.0%	#DIV/0!	-150.0%	-100.0%	-500.0%	-172.7%	-174.0%	7.1%	16.9%	10.1%	23.7%	2.2%

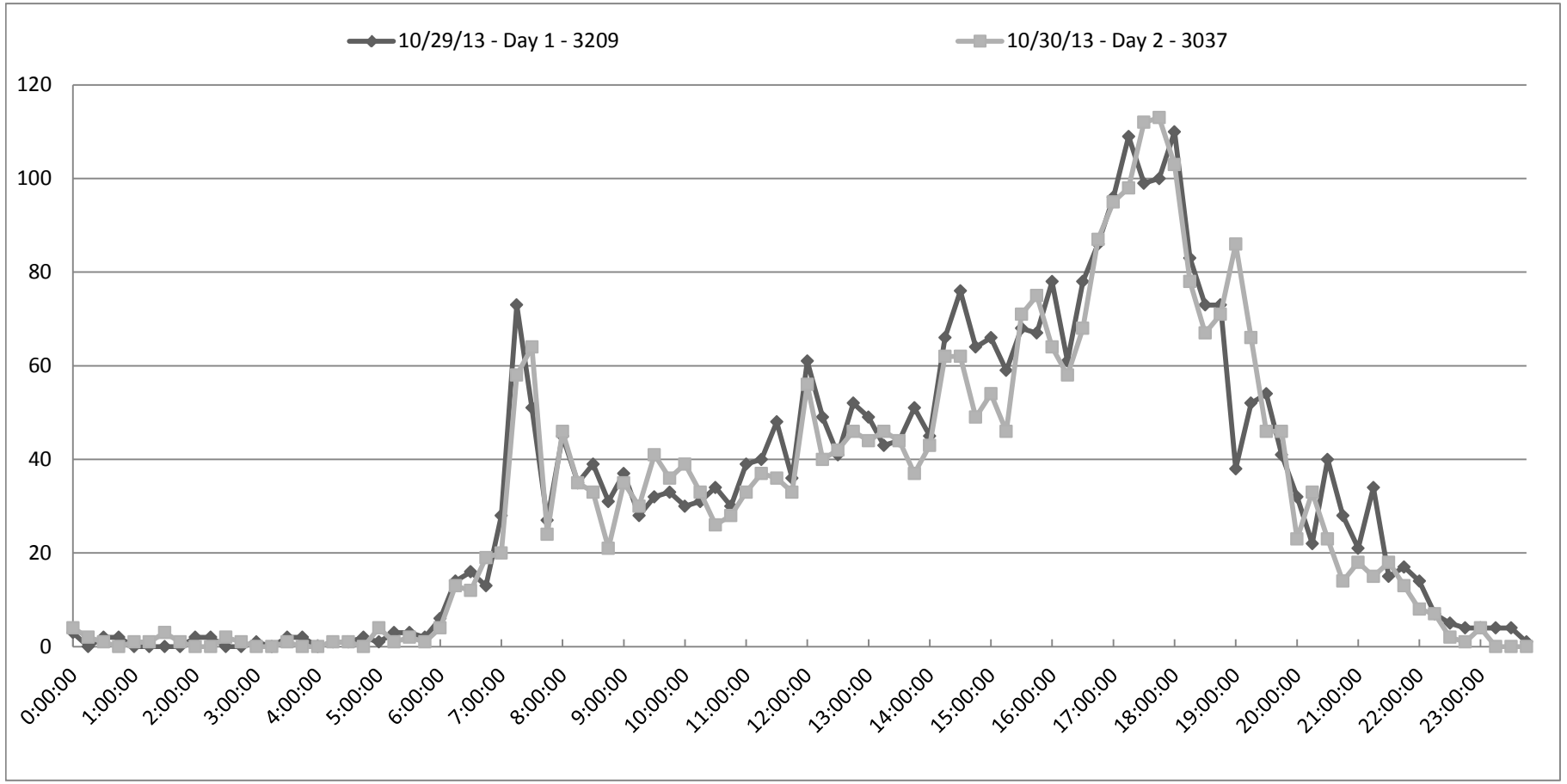
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	178	150	197	202	223	223	160	125	64	32	31	10
10/30/13 - Day 2	170	158	205	227	188	180	91	54	57	16	13	0
Diff	8	-8	-8	-25	35	43	69	71	7	16	18	10
% of Diff	4.5%	-5.3%	-4.1%	-12.4%	15.7%	19.3%	43.1%	56.8%	10.9%	50.0%	58.1%	100.0%



RM 1826 North of Lewis Mountain Drive

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	7	0	4	5	4	9	49	179	150	130	125	163
10/30/13 - Day 2	5	3	2	2	7	30	161	138	127	134	134	171
Diff	2	-3	2	3	-3	-21	-112	41	23	-4	-9	-8
% of Diff	28.6%	#DIV/0!	50.0%	60.0%	-75.0%	-233.3%	-228.6%	22.9%	15.3%	-3.1%	-7.2%	-4.9%

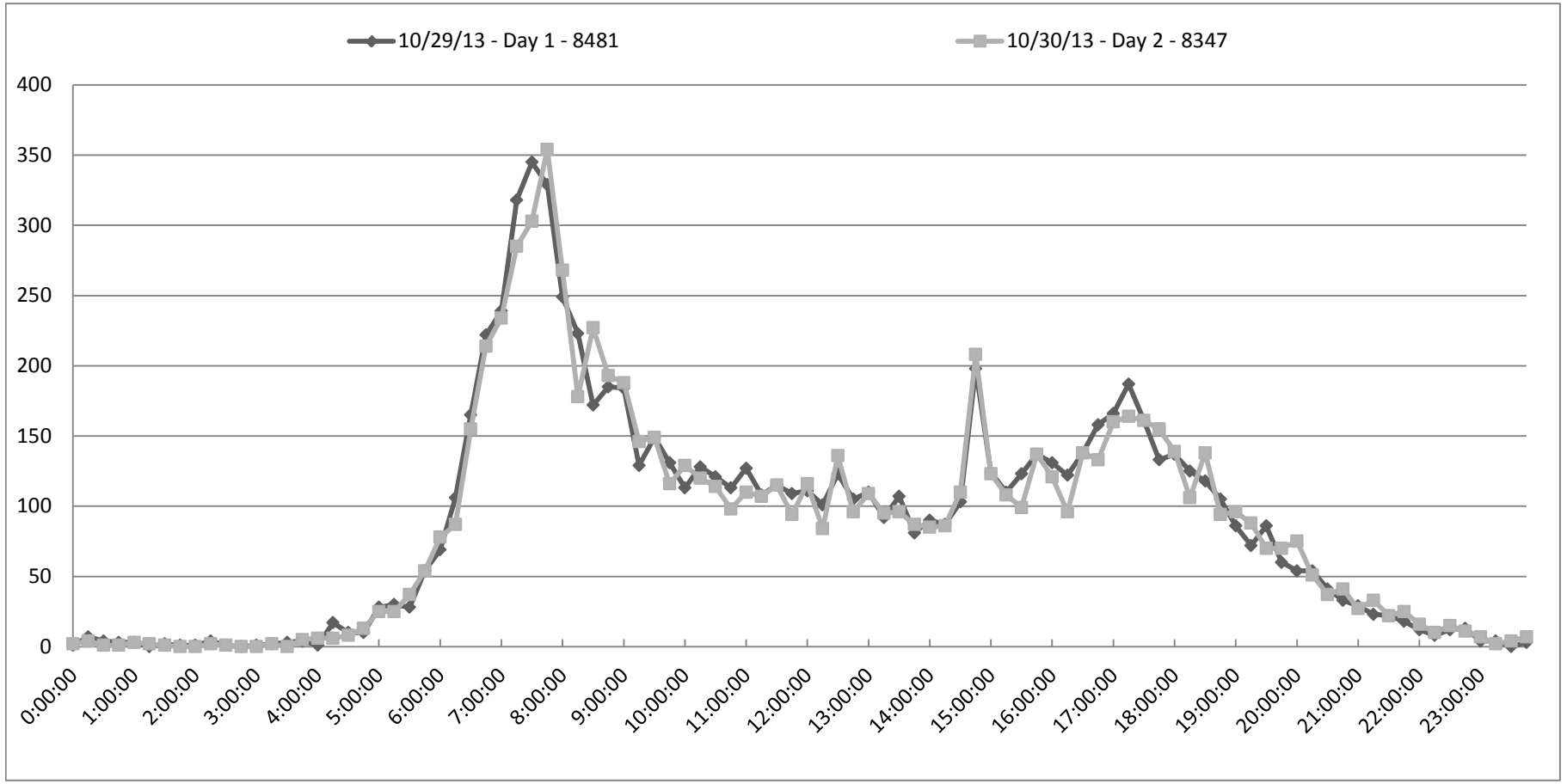
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	203	187	251	260	303	404	339	185	122	87	30	13
10/30/13 - Day 2	180	204	220	265	392	361	269	125	65	30	5	0
Diff	23	-17	31	-5	-89	43	70	60	57	57	25	13
% of Diff	11.3%	-9.1%	12.4%	-1.9%	-29.4%	10.6%	20.6%	32.4%	46.7%	65.5%	83.3%	100.0%



Escarpment Boulevard South of Slaughter Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	15	6	6	10	38	140	562	1231	829	593	475	459
10/30/13 - Day 2	7	3	2	25	100	374	1036	1027	676	479	430	430
Diff	8	3	4	-15	-62	-234	-474	204	153	114	45	29
% of Diff	53.3%	50.0%	66.7%	-150.0%	-163.2%	-167.1%	-84.3%	16.6%	18.5%	19.2%	9.5%	6.3%

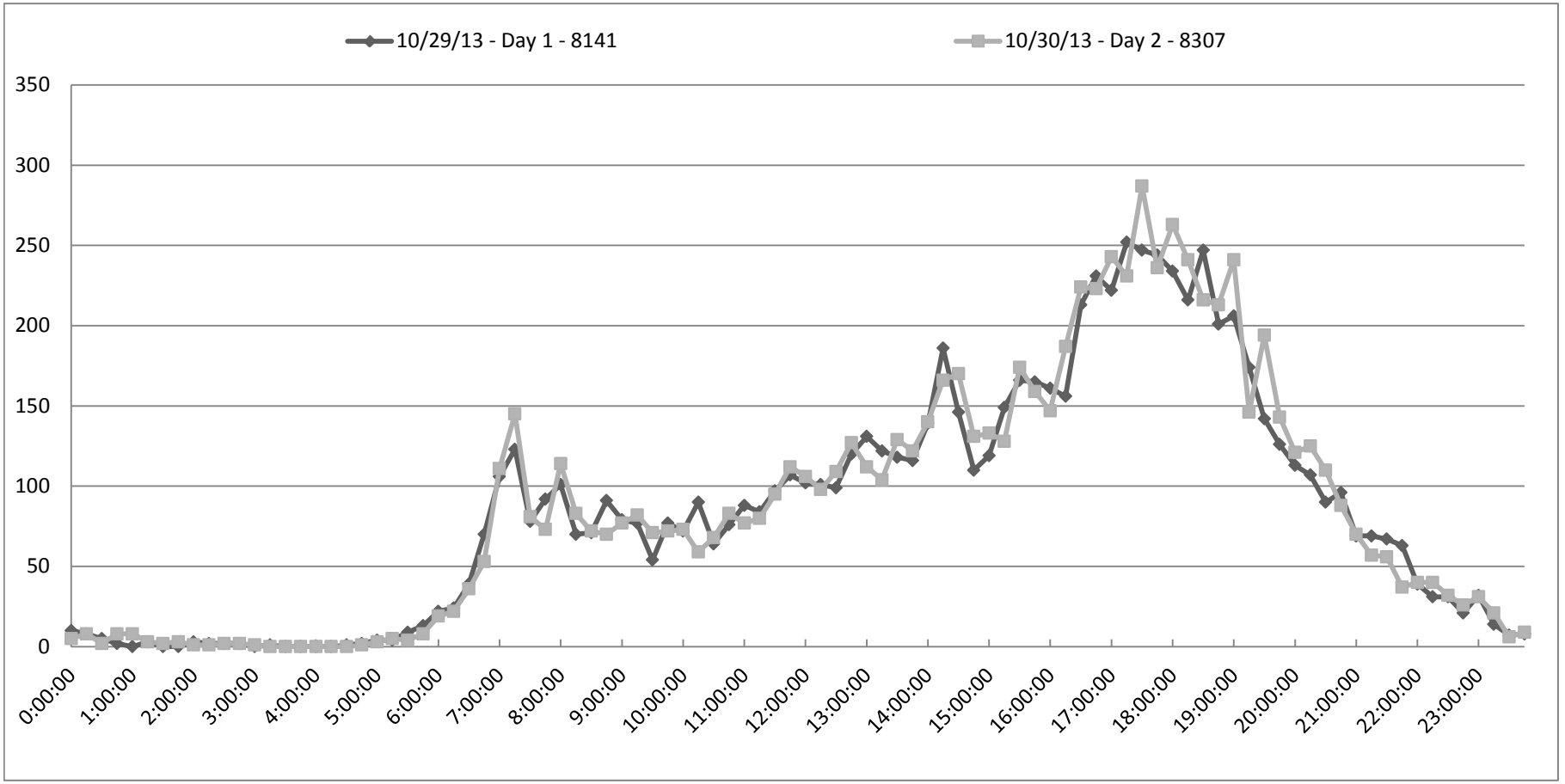
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	440	390	478	494	549	647	485	304	182	92	45	11
10/30/13 - Day 2	396	368	538	492	618	538	348	233	123	66	24	7
Diff	44	22	-60	2	-69	109	137	71	59	26	21	4
% of Diff	10.0%	5.6%	-12.6%	0.4%	-12.6%	16.8%	28.2%	23.4%	32.4%	28.3%	46.7%	36.4%

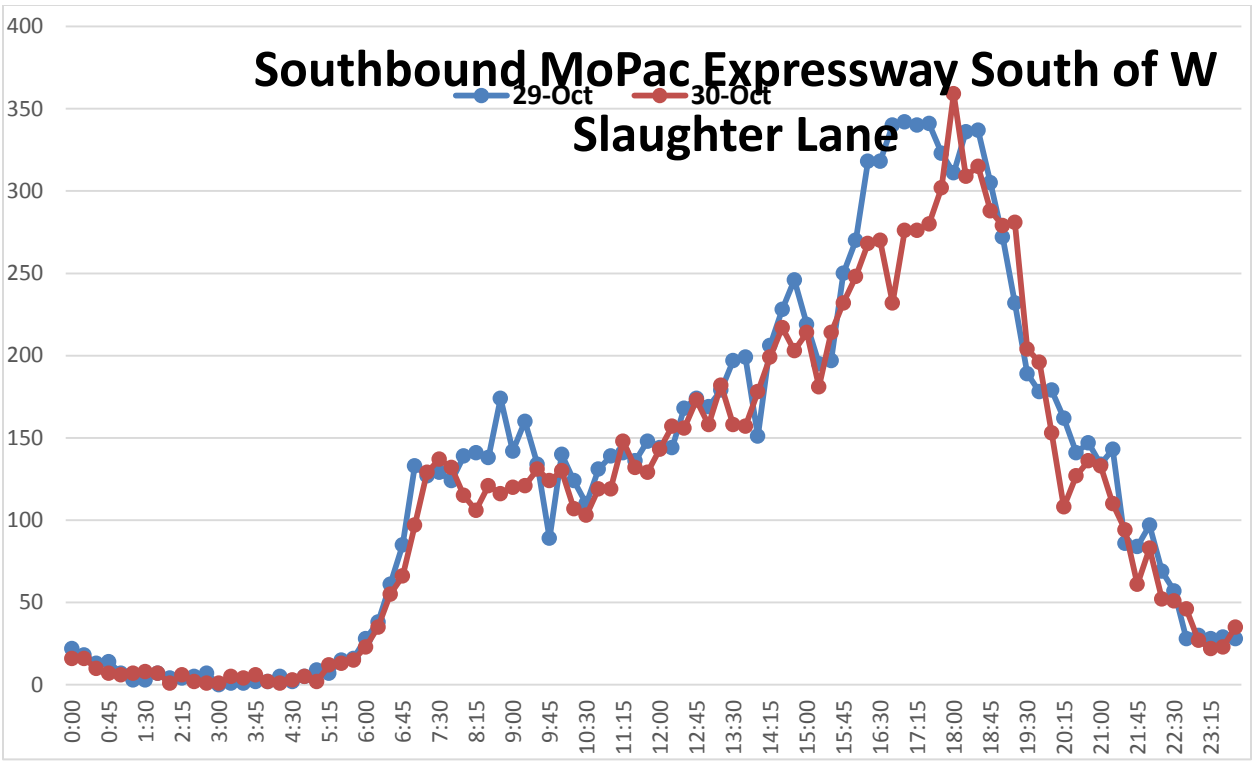


Escarpment Boulevard South of Slaughter Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	25	3	9	1	3	30	155	399	333	287	302	376
10/30/13 - Day 2	21	7	3	0	13	85	390	342	300	272	335	425
Diff	4	-4	6	1	-10	-55	-235	57	33	15	-33	-49
% of Diff	16.0%	-133.3%	66.7%	100.0%	-333.3%	-183.3%	-151.6%	14.3%	9.9%	5.2%	-10.9%	-13.0%

	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	422	487	581	599	761	965	898	648	406	268	122	61
10/30/13 - Day 2	472	598	566	717	984	956	794	499	271	149	84	9
Diff	-50	-111	15	-118	-223	9	104	149	135	119	38	52
% of Diff	-11.8%	-22.8%	2.6%	-19.7%	-29.3%	0.9%	11.6%	23.0%	33.3%	44.4%	31.1%	85.2%




Southbound MoPac Expressway South of W Slaughter Lane
29-Oct
30-Oct
400
350
300
250
200
150
100
50
0
0:00
0:45
1:30
2:15
3:00
3:45
4:30
5:15
6:00
6:45
7:30
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9:00
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14:15
15:00
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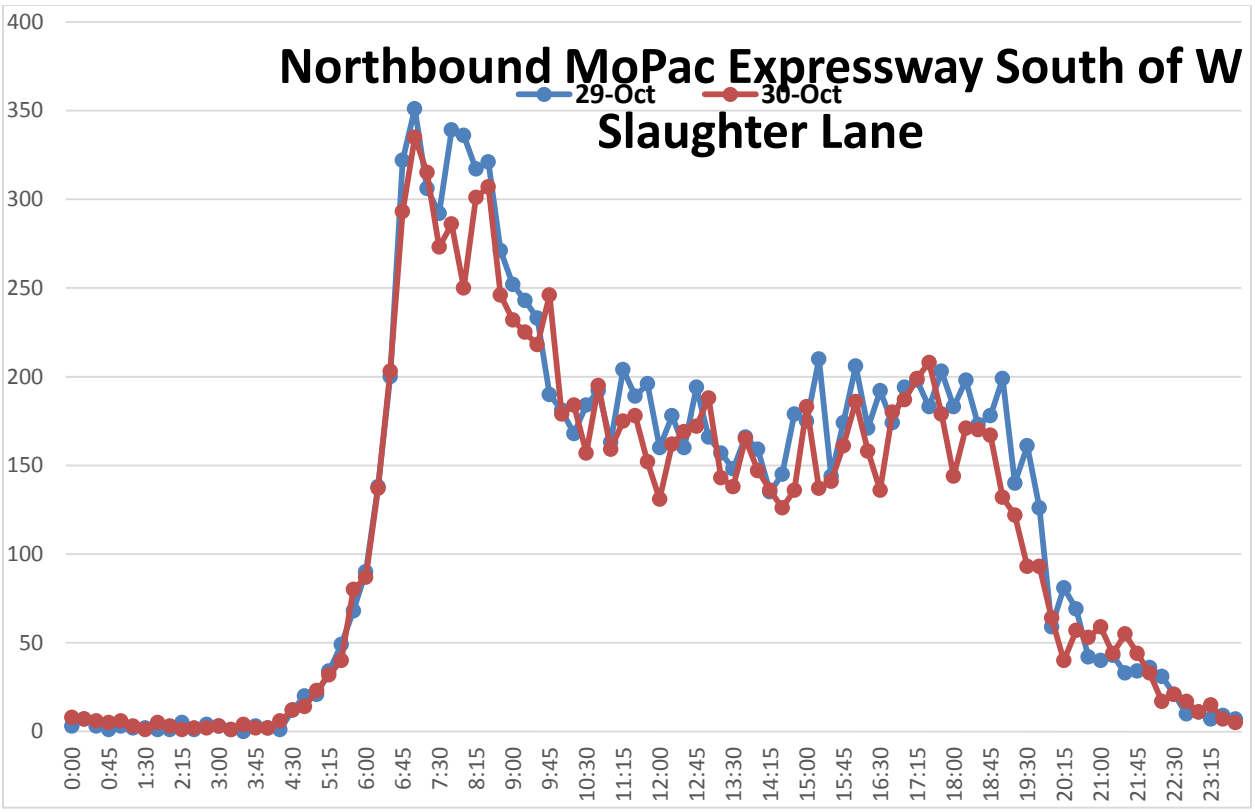
20:15
21:00
21:45
22:30
23:15


Northbound MoPac Expressway South of W Slaughter Lane
29-Oct
30-Oct
400
350
300
250
200
150
100
50
0
0:00
0:45
1:30
2:15
3:00
3:45
4:30
5:15
6:00
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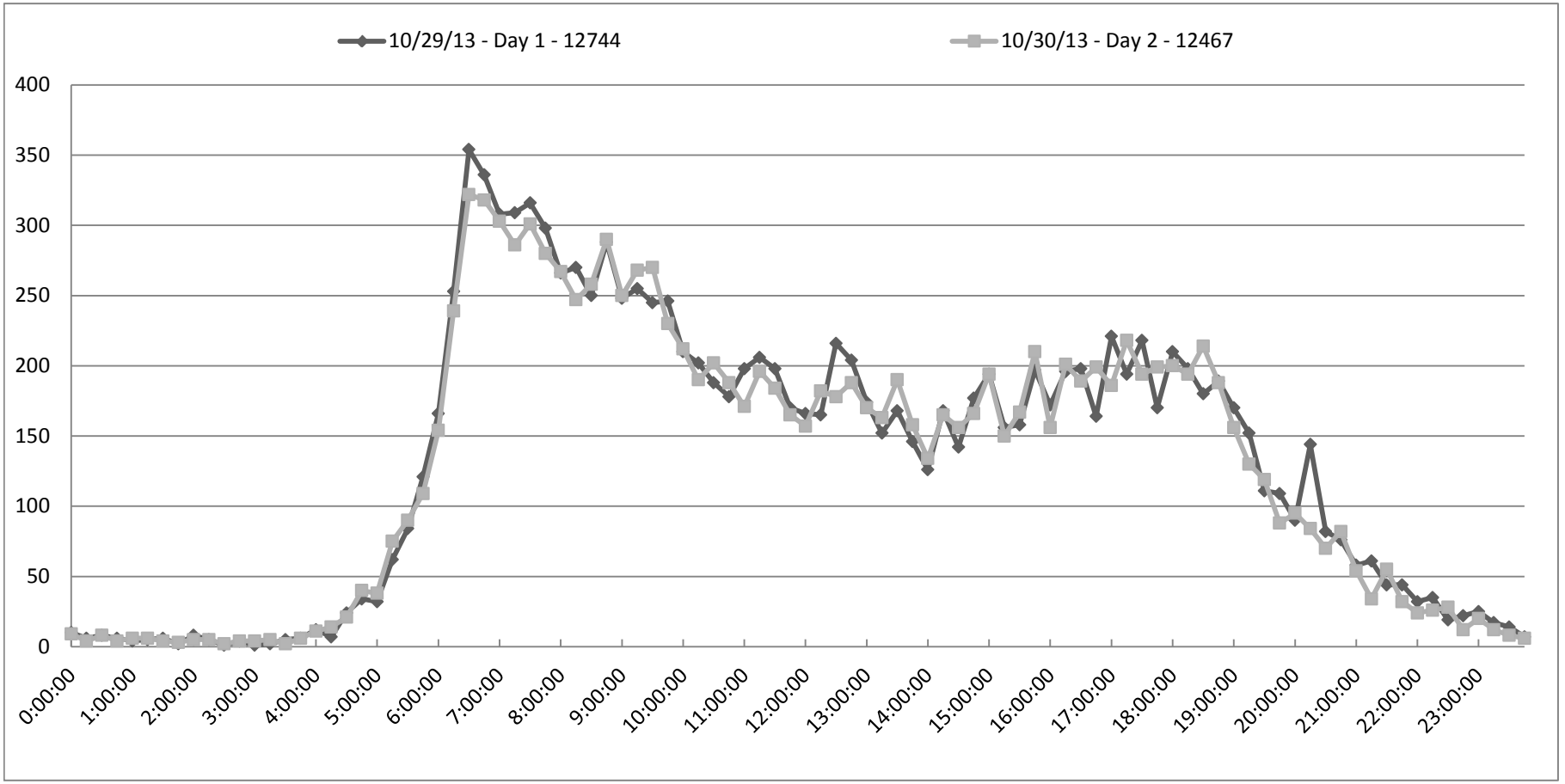
15:00
15:45
16:30
17:15
18:00
18:45
19:30
20:15
21:00
21:45
22:30
23:15

Brodie Lane South of Slaughter Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	30	17	18	14	77	299	1109	1231	1074	994	778	772
10/30/13 - Day 2	20	15	15	52	243	824	1208	1052	1078	834	739	682
Diff	10	2	3	-38	-166	-525	-99	179	-4	160	39	90
% of Diff	33.3%	11.8%	16.7%	-271.4%	-215.6%	-175.6%	-8.9%	14.5%	-0.4%	16.1%	5.0%	11.7%

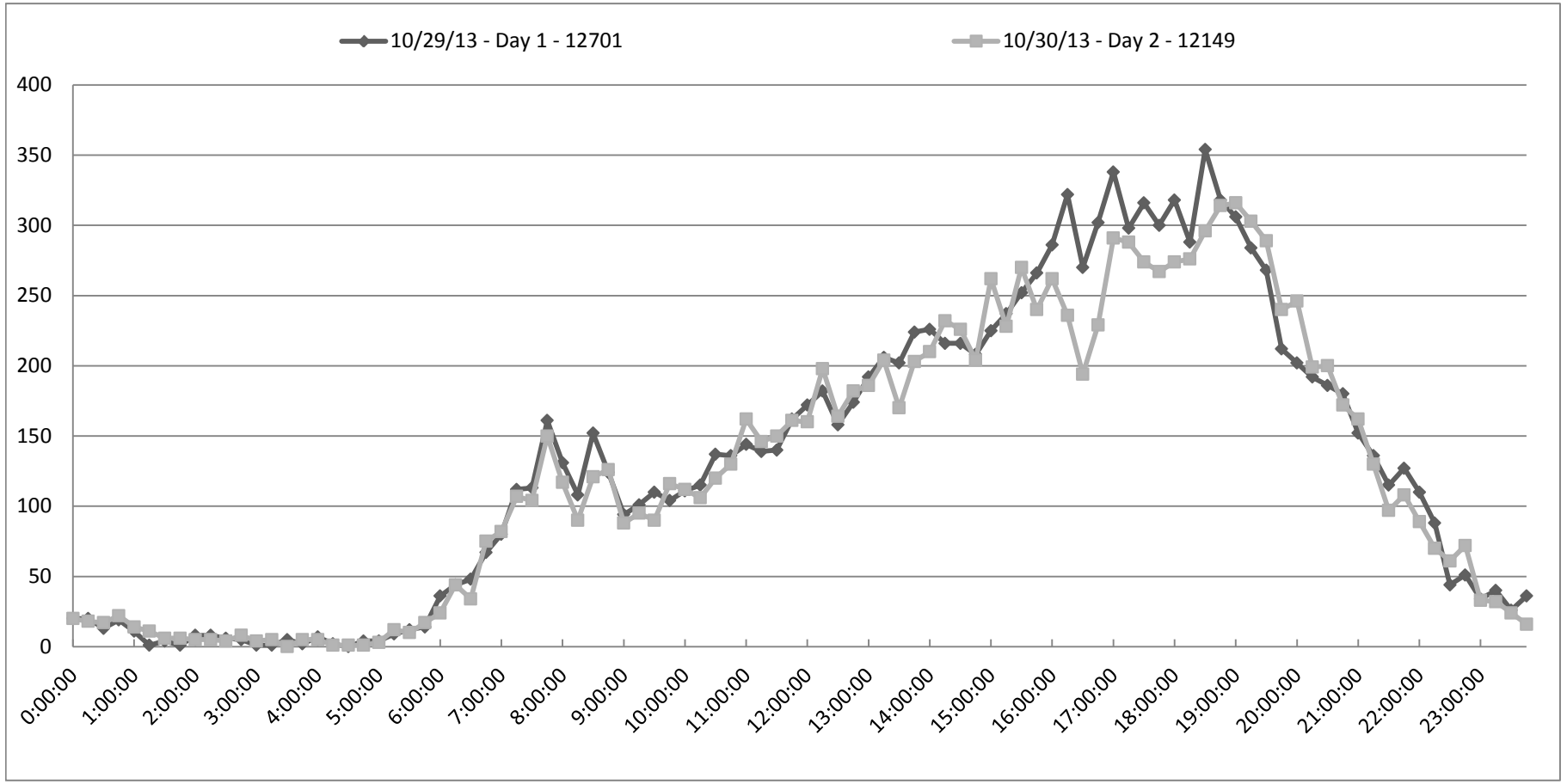
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	751	640	613	705	730	803	777	542	392	207	108	63
10/30/13 - Day 2	711	613	677	756	797	807	593	337	225	110	52	6
Diff	40	27	-64	-51	-67	-4	184	205	167	97	56	57
% of Diff	5.3%	4.2%	-10.4%	-7.2%	-9.2%	-0.5%	23.7%	37.8%	42.6%	46.9%	51.9%	90.5%



Brodie Lane South of Slaughter Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	72	17	27	9	13	39	195	466	515	409	499	585
10/30/13 - Day 2	53	20	17	12	26	119	368	478	399	454	588	683
Diff	19	-3	10	-3	-13	-80	-173	-12	116	-45	-89	-98
% of Diff	26.4%	-17.6%	37.0%	-33.3%	-100.0%	-205.1%	-88.7%	-2.6%	22.5%	-11.0%	-17.8%	-16.8%

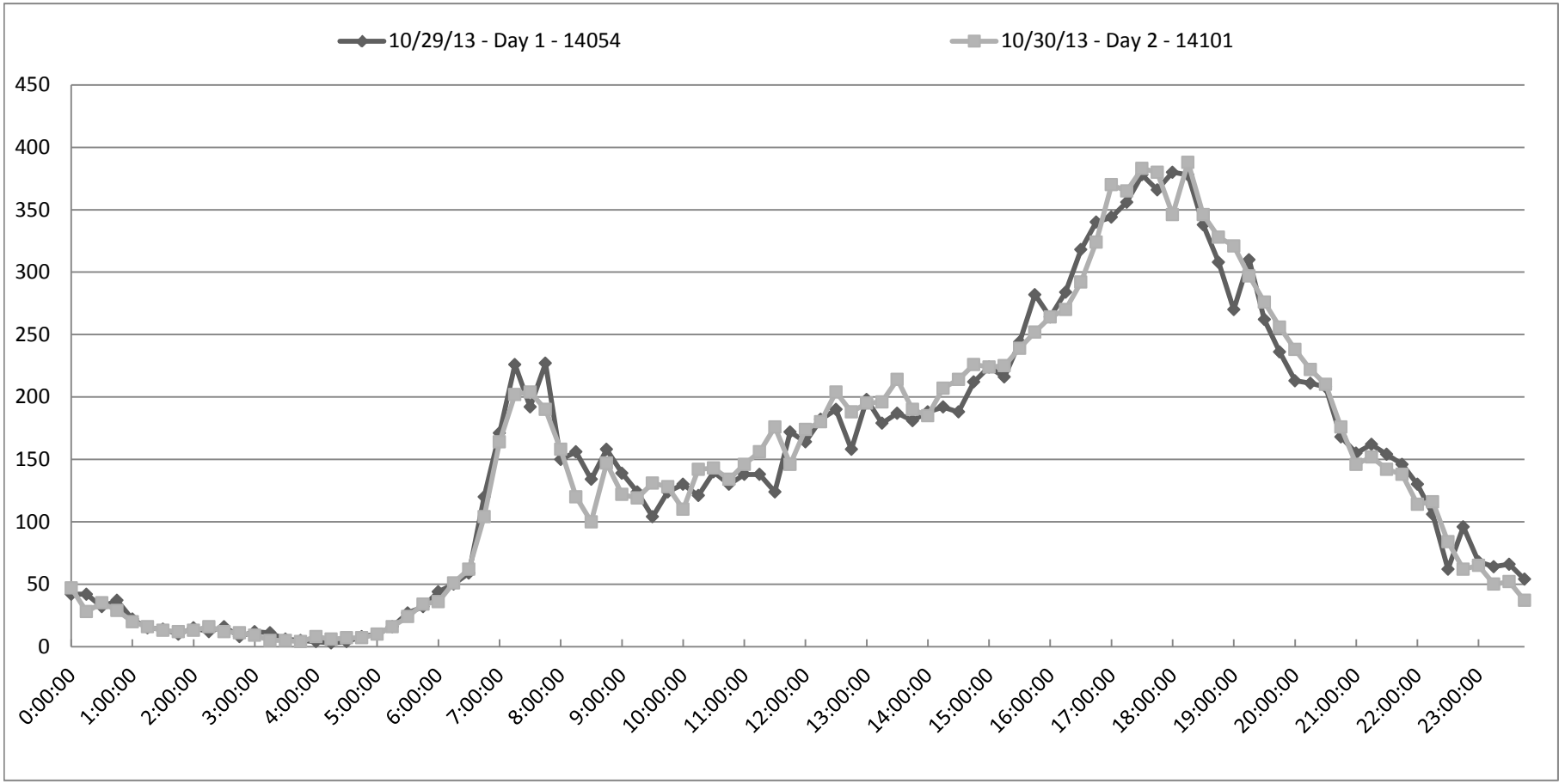
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	686	824	866	980	1180	1252	1278	1070	760	530	293	136
10/30/13 - Day 2	742	871	964	932	1082	1113	1222	885	561	328	161	16
Diff	-56	-47	-98	48	98	139	56	185	199	202	132	120
% of Diff	-8.2%	-5.7%	-11.3%	4.9%	8.3%	11.1%	4.4%	17.3%	26.2%	38.1%	45.1%	88.2%

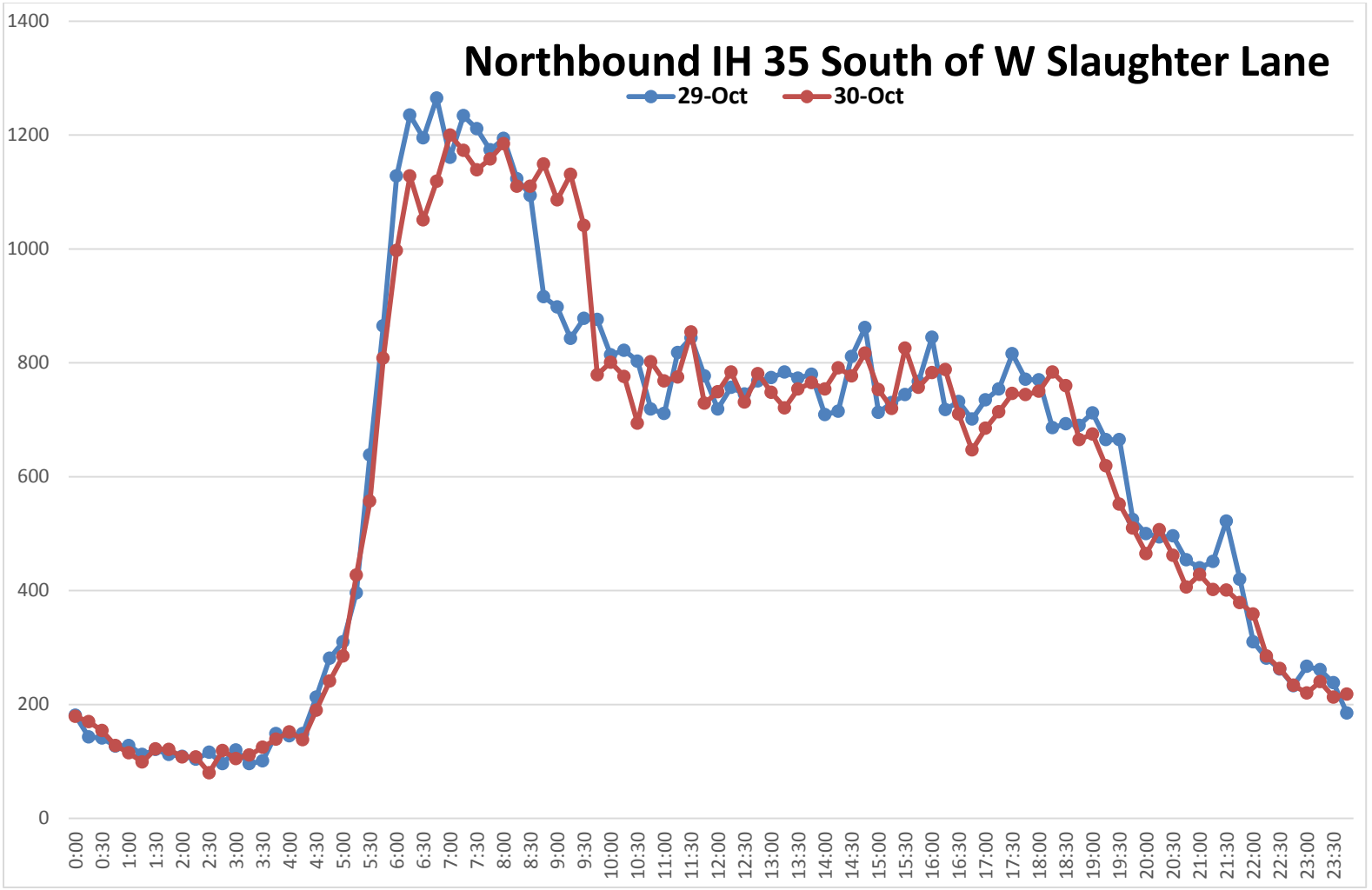


Manchaca Road South of Slaughter Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	153	61	51	34	19	85	273	816	598	491	521	572
10/30/13 - Day 2	78	53	30	25	57	183	674	568	519	523	612	704
Diff	75	8	21	9	-38	-98	-401	248	79	-32	-91	-132
% of Diff	49.0%	13.1%	41.2%	26.5%	-200.0%	-115.3%	-146.9%	30.4%	13.2%	-6.5%	-17.5%	-23.1%

	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	694	745	780	966	1206	1444	1404	1078	800	617	394	252
10/30/13 - Day 2	793	796	914	1078	1442	1460	1222	926	616	452	229	37
Diff	-99	-51	-134	-112	-236	-16	182	152	184	165	165	215
% of Diff	-14.3%	-6.8%	-17.2%	-11.6%	-19.6%	-1.1%	13.0%	14.1%	23.0%	26.7%	41.9%	85.3%




Northbound IH 35 South of W Slaughter Lane
29-Oct
30-Oct
1400
1200
1000
800
600
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200
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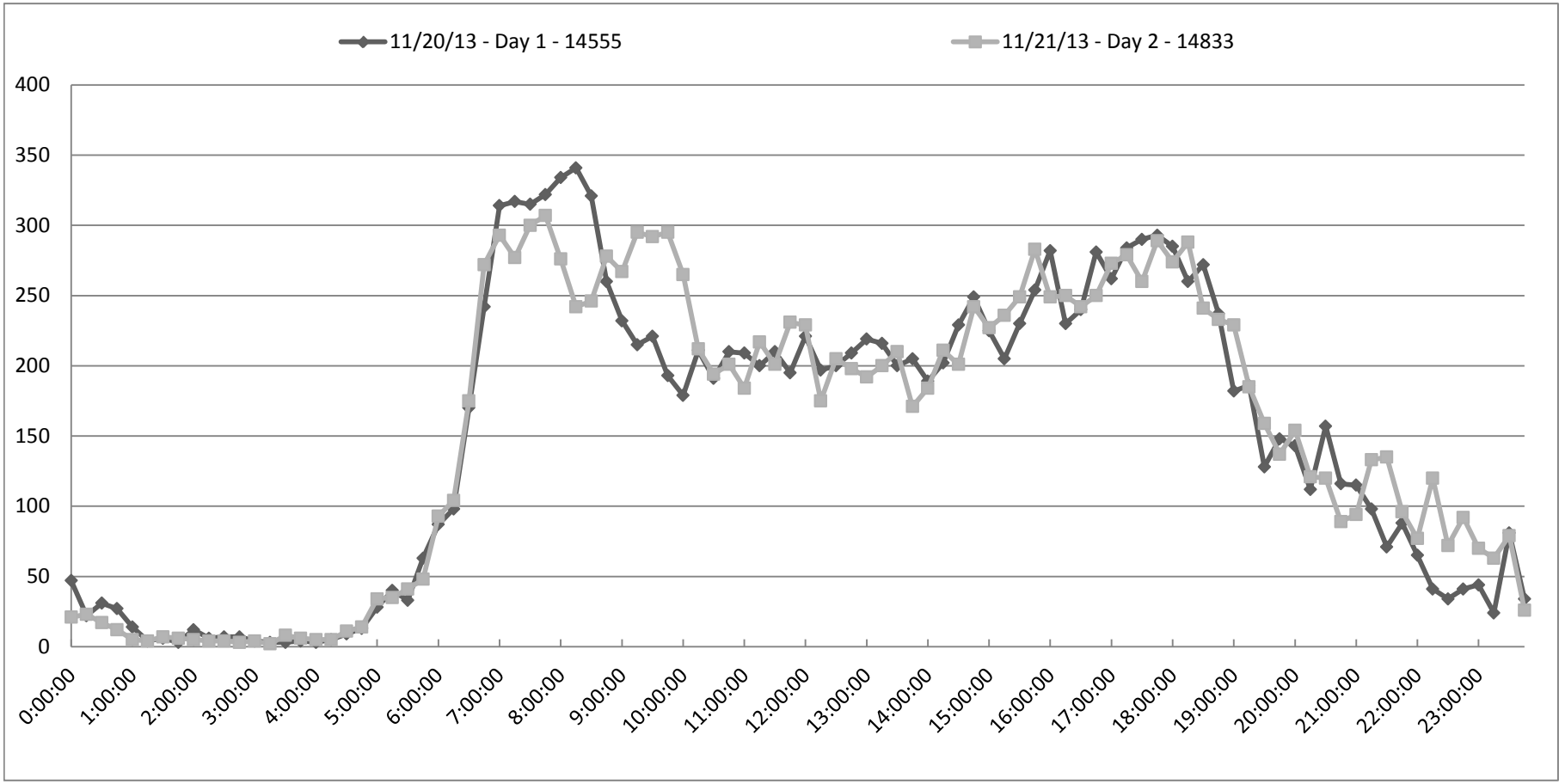
23:30

Slaughter Lane West of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
11/20/13 - Day 1	127	27	32	14	30	164	597	1268	1256	861	791	814
11/21/13 - Day 2	73	22	16	20	35	158	644	1177	1042	1149	872	833
Diff	54	5	16	-6	-5	6	-47	91	214	-288	-81	-19
% of Diff	42.5%	18.5%	50.0%	-42.9%	-16.7%	3.7%	-7.9%	7.2%	17.0%	-33.4%	-10.2%	-2.3%

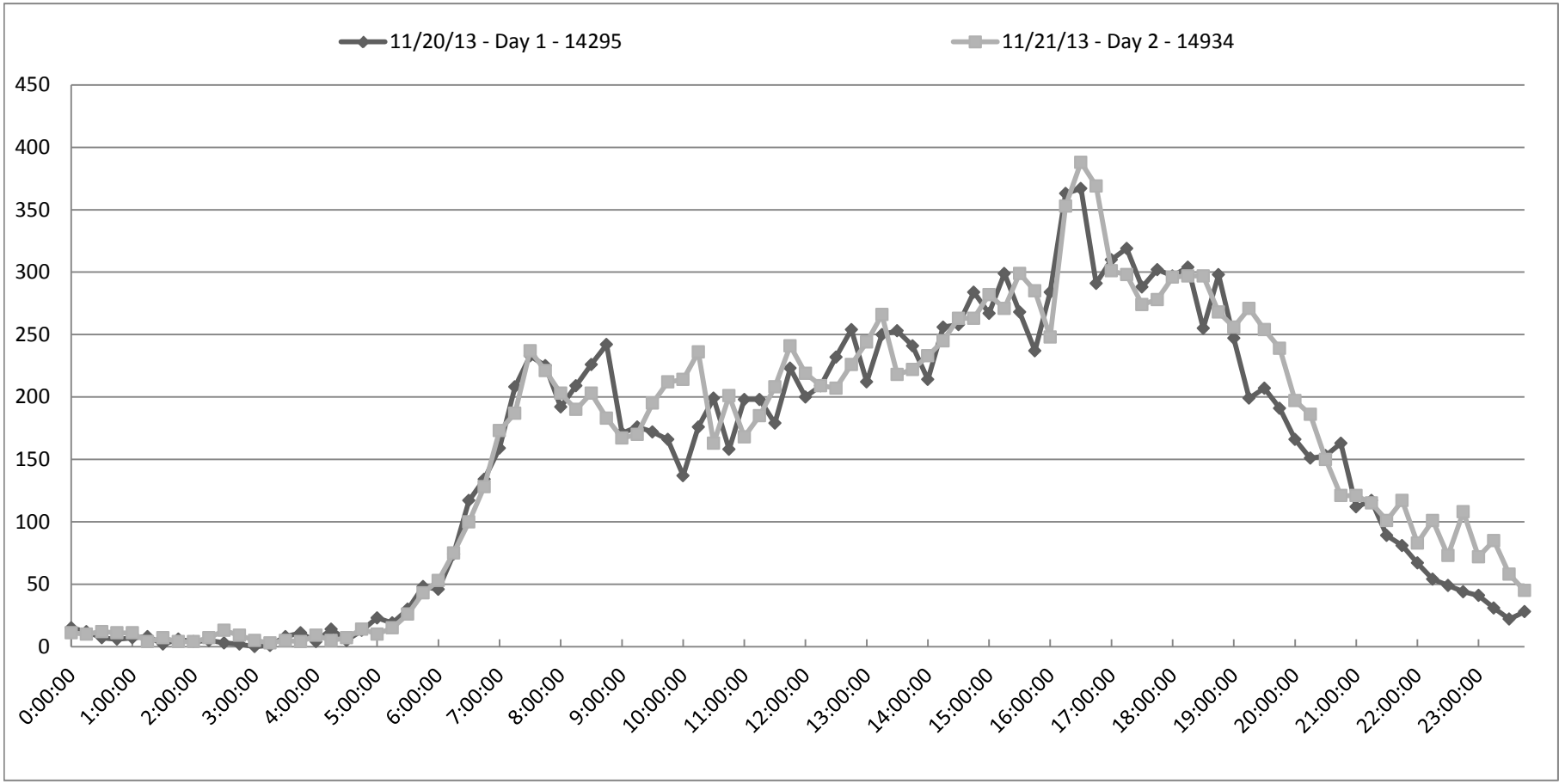
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
11/20/13 - Day 1	827	840	869	914	1033	1129	1054	644	528	372	181	183
11/21/13 - Day 2	807	773	838	995	991	1101	1036	710	484	458	361	238
Diff	20	67	31	-81	42	28	18	-66	44	-86	-180	-55
% of Diff	2.4%	8.0%	3.6%	-8.9%	4.1%	2.5%	1.7%	-10.2%	8.3%	-23.1%	-99.4%	-30.1%



Slaughter Lane West of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
11/20/13 - Day 1	40	23	14	20	36	120	371	825	869	685	670	798
11/21/13 - Day 2	44	26	33	17	35	94	356	818	779	744	814	802
Diff	-4	-3	-19	3	1	26	15	7	90	-59	-144	-4
% of Diff	-10.0%	-13.0%	-135.7%	15.0%	2.8%	21.7%	4.0%	0.8%	10.4%	-8.6%	-21.5%	-0.5%

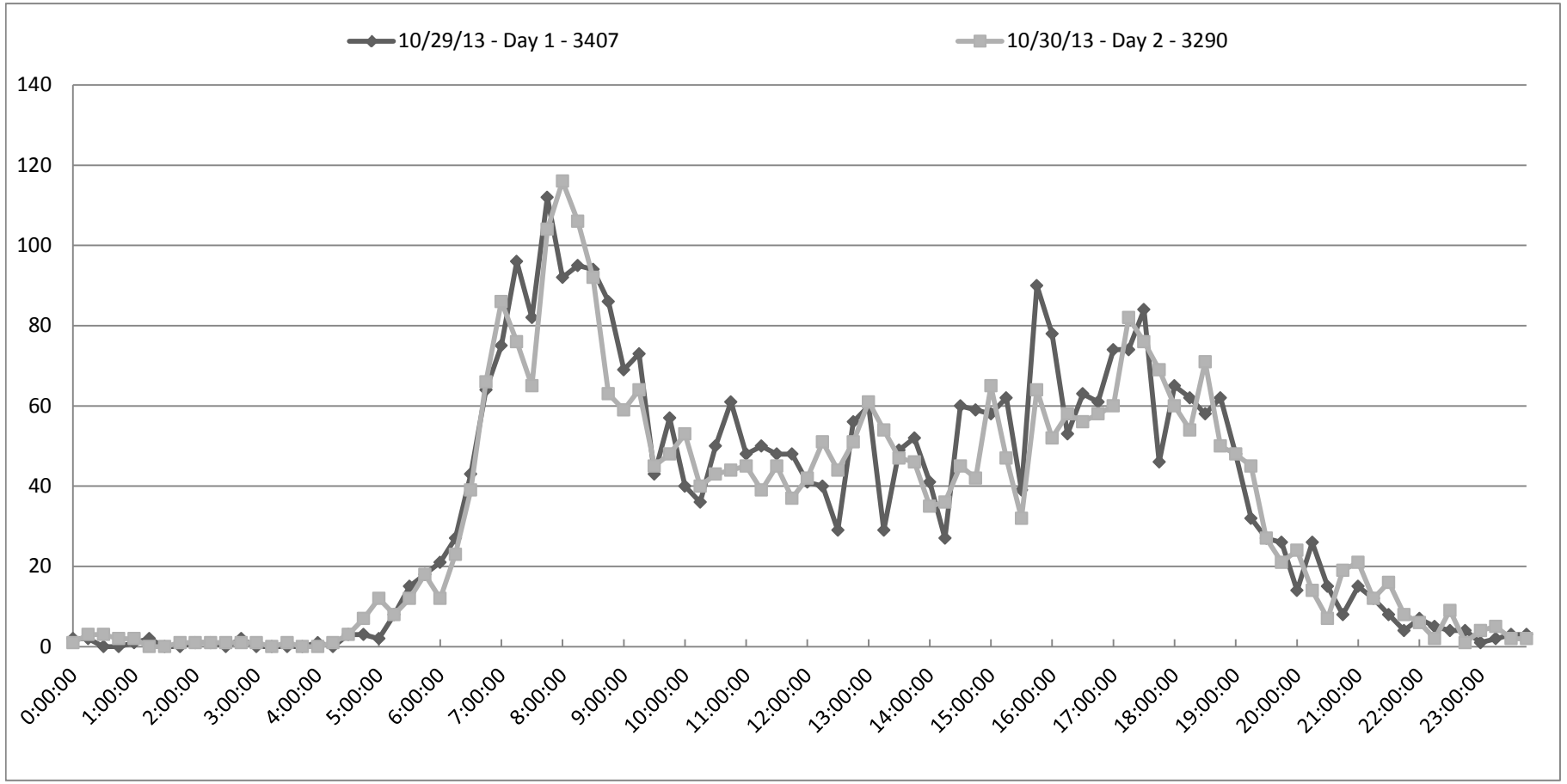
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
11/20/13 - Day 1	895	956	1012	1071	1305	1219	1154	844	633	399	214	122
11/21/13 - Day 2	861	950	1004	1137	1358	1151	1158	1020	654	454	365	260
Diff	34	6	8	-66	-53	68	-4	-176	-21	-55	-151	-138
% of Diff	3.8%	0.6%	0.8%	-6.2%	-4.1%	5.6%	-0.3%	-20.9%	-3.3%	-13.8%	-70.6%	-113.1%



EB La Cross Avenue West of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	4	3	4	0	7	43	155	365	367	242	187	194
10/30/13 - Day 2	4	4	3	4	39	92	293	418	231	184	173	174
Diff	0	-1	1	-4	-32	-49	-138	-53	136	58	14	20
% of Diff	0.0%	-33.3%	25.0%	#DIV/0!	-457.1%	-114.0%	-89.0%	-14.5%	37.1%	24.0%	7.5%	10.3%

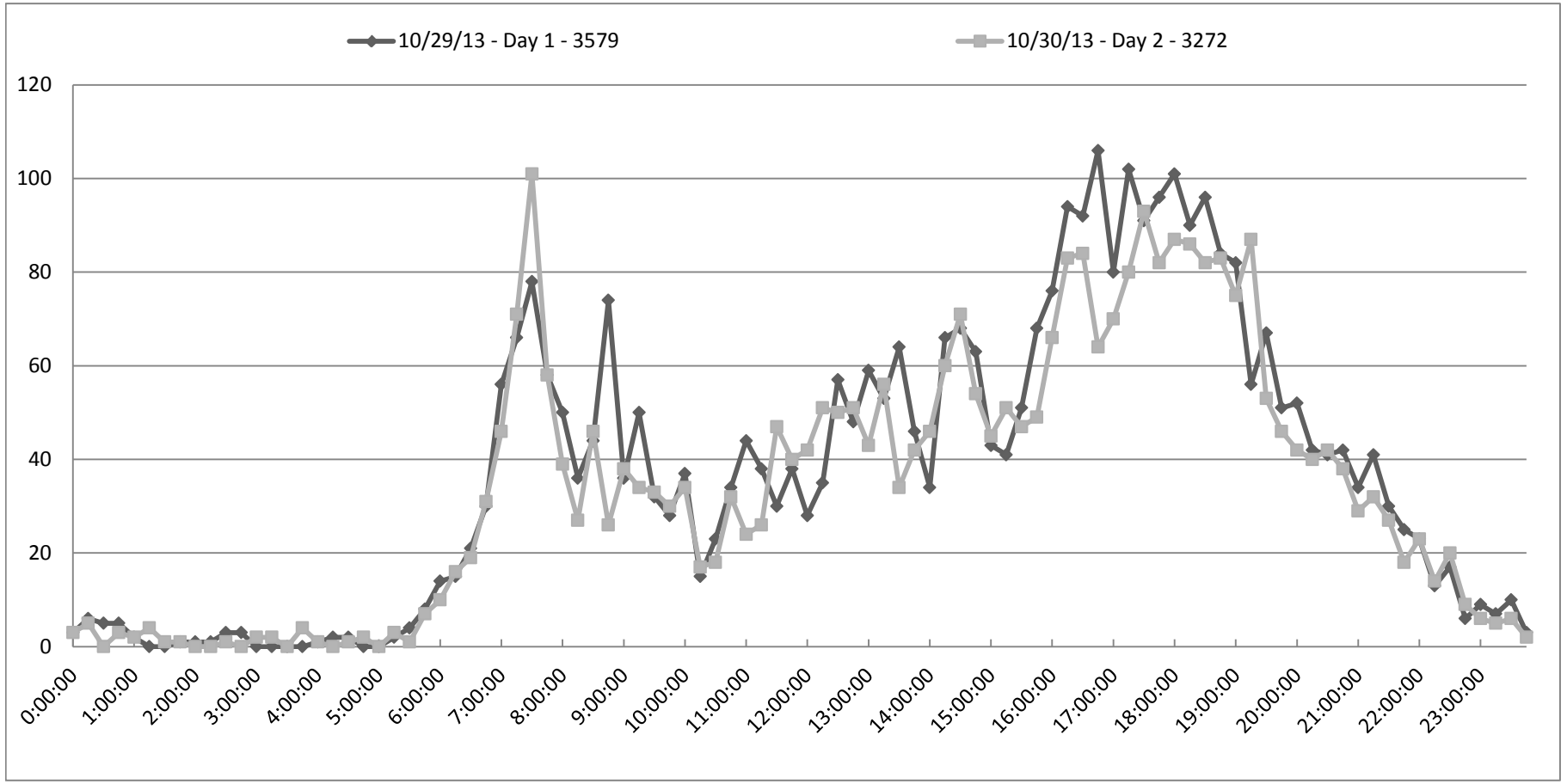
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	166	190	187	249	255	278	247	133	63	39	20	9
10/30/13 - Day 2	213	162	186	230	276	254	170	66	68	25	12	2
Diff	-47	28	1	19	-21	24	77	67	-5	14	8	7
% of Diff	-28.3%	14.7%	0.5%	7.6%	-8.2%	8.6%	31.2%	50.4%	-7.9%	35.9%	40.0%	77.8%



WB La Cross Avenue West of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	19	3	8	0	5	14	80	258	204	146	109	150
10/30/13 - Day 2	10	2	4	6	6	52	249	170	131	99	129	183
Diff	9	1	4	-6	-1	-38	-169	88	73	47	-20	-33
% of Diff	47.4%	33.3%	50.0%	#DIV/0!	-20.0%	-271.4%	-211.3%	34.1%	35.8%	32.2%	-18.3%	-22.0%

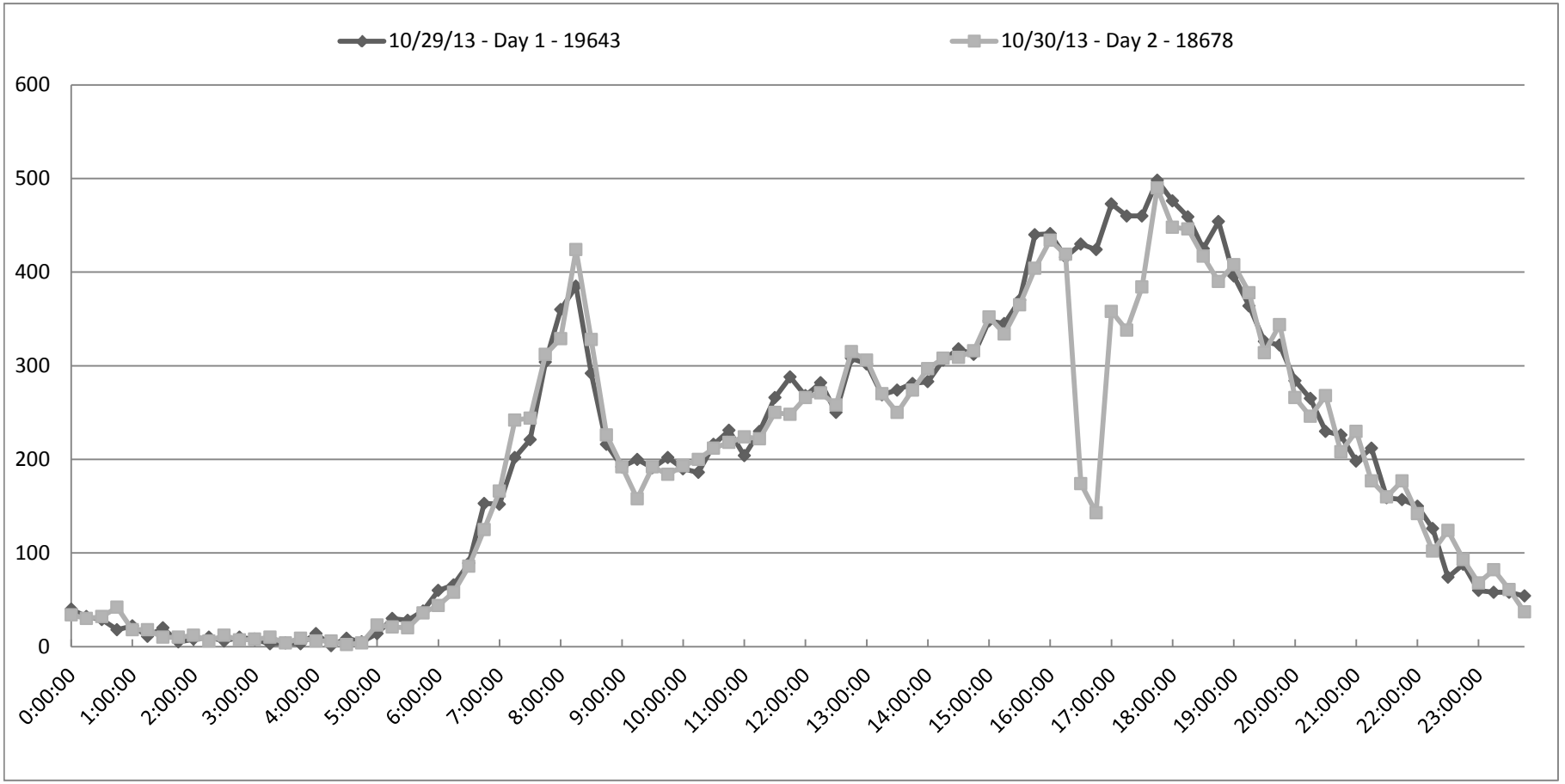
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	168	222	231	203	368	369	371	256	177	130	59	29
10/30/13 - Day 2	184	219	197	282	307	337	298	170	126	75	26	2
Diff	-16	3	34	-79	61	32	73	86	51	55	33	27
% of Diff	-9.5%	1.4%	14.7%	-38.9%	16.6%	8.7%	19.7%	33.6%	28.8%	42.3%	55.9%	93.1%



EB Slaughter Lane East of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	119	58	34	18	29	110	368	879	1253	785	823	988
10/30/13 - Day 2	88	40	29	23	68	224	777	1393	768	789	914	1043
Diff	31	18	5	-5	-39	-114	-409	-514	485	-4	-91	-55
% of Diff	26.1%	31.0%	14.7%	-27.8%	-134.5%	-103.6%	-111.1%	-58.5%	38.7%	-0.5%	-11.1%	-5.6%

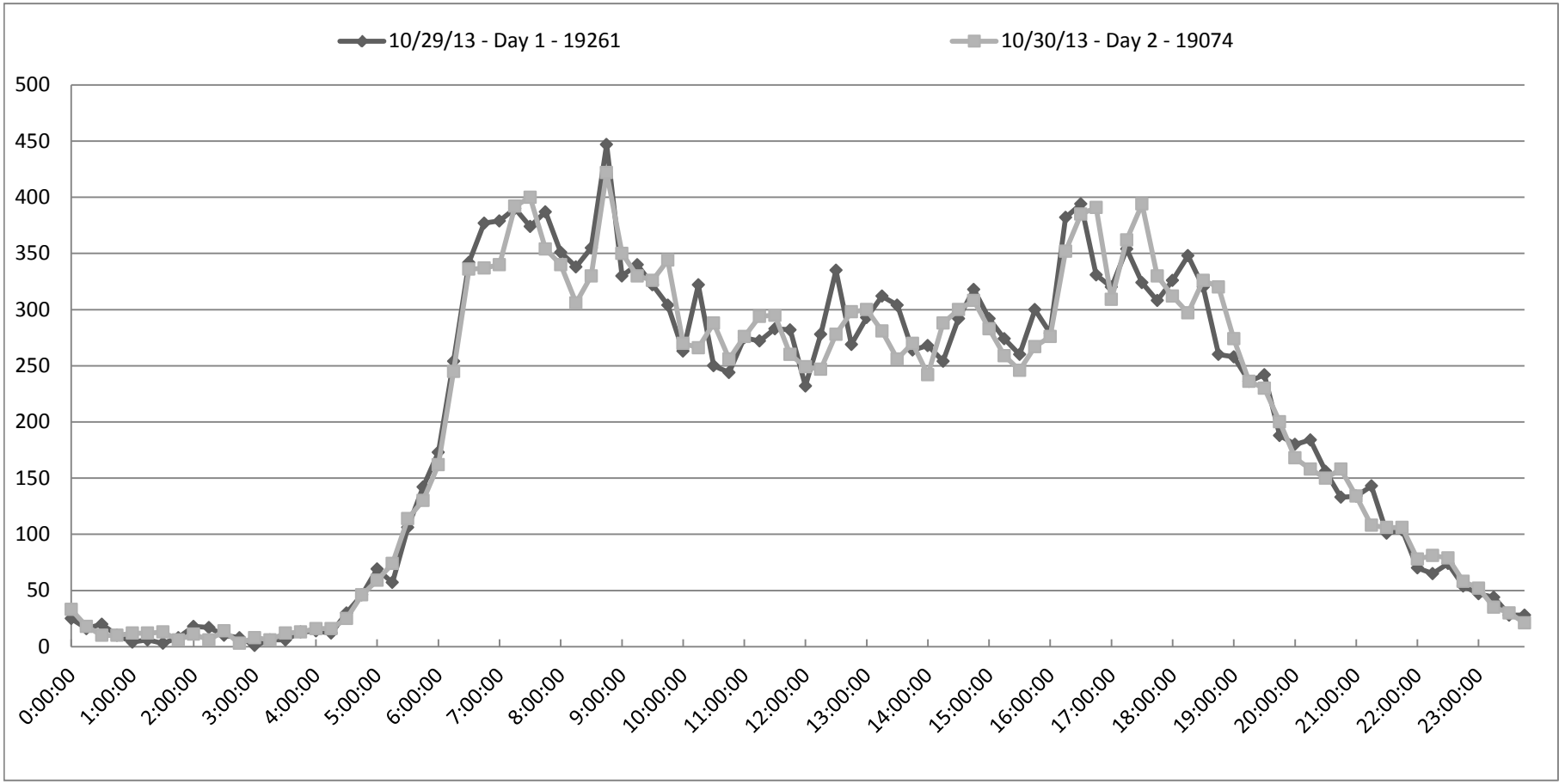
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	1108	1126	1219	1503	1711	1891	1814	1408	1005	726	438	230
10/30/13 - Day 2	1141	1188	1367	1431	1223	1801	1490	1124	775	545	304	37
Diff	-33	-62	-148	72	488	90	324	284	230	181	134	193
% of Diff	-3.0%	-5.5%	-12.1%	4.8%	28.5%	4.8%	17.9%	20.2%	22.9%	24.9%	30.6%	83.9%



WB Slaughter Lane East of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	71	21	53	26	102	374	1146	1530	1491	1296	1079	1112
10/30/13 - Day 2	47	37	29	70	293	873	1469	1330	1428	1168	1121	1034
Diff	24	-16	24	-44	-191	-499	-323	200	63	128	-42	78
% of Diff	33.8%	-76.2%	45.3%	-169.2%	-187.3%	-133.4%	-28.2%	13.1%	4.2%	9.9%	-3.9%	7.0%

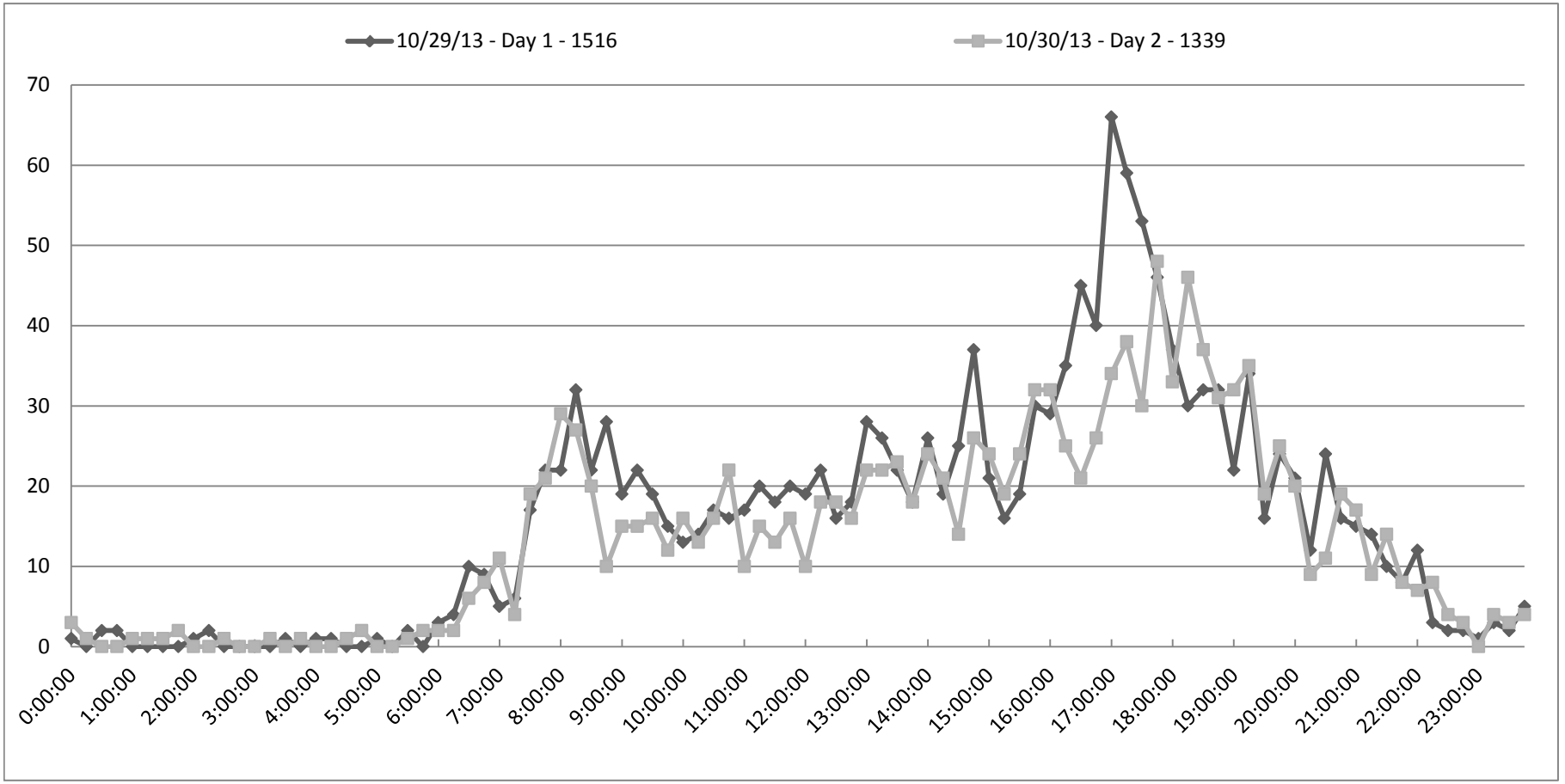
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	1114	1173	1132	1126	1386	1306	1254	924	653	482	263	147
10/30/13 - Day 2	1135	1100	1096	1280	1456	1265	1060	676	506	344	175	21
Diff	-21	73	36	-154	-70	41	194	248	147	138	88	126
% of Diff	-1.9%	6.2%	3.2%	-13.7%	-5.1%	3.1%	15.5%	26.8%	22.5%	28.6%	33.5%	85.7%



EB La Cross Avenue East of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	5	0	3	1	2	3	26	50	104	75	60	75
10/30/13 - Day 2	3	3	1	2	3	12	42	97	56	57	60	62
Diff	2	-3	2	-1	-1	-9	-16	-47	48	18	0	13
% of Diff	40.0%	#DIV/0!	66.7%	-100.0%	-50.0%	-300.0%	-61.5%	-94.0%	46.2%	24.0%	0.0%	17.3%

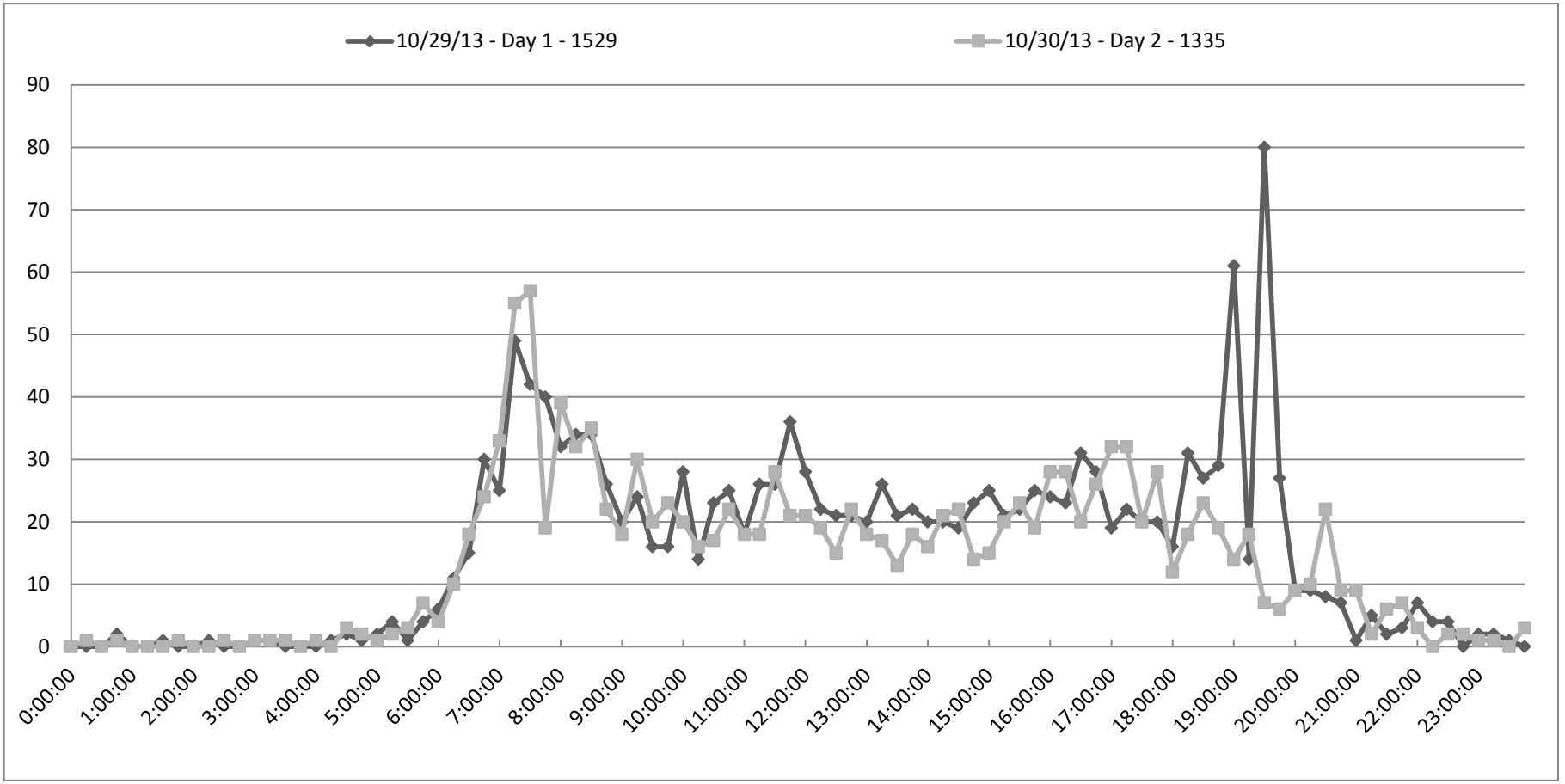
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	75	94	107	86	149	224	131	96	73	47	19	11
10/30/13 - Day 2	83	77	93	110	128	164	117	65	59	27	10	4
Diff	-8	17	14	-24	21	60	14	31	14	20	9	7
% of Diff	-10.7%	18.1%	13.1%	-27.9%	14.1%	26.8%	10.7%	32.3%	19.2%	42.6%	47.4%	63.6%



WB La Cross Avenue East of MoPac Expressway

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	2	1	1	2	4	11	62	156	126	76	90	106
10/30/13 - Day 2	1	2	3	4	8	39	169	125	90	76	86	76
Diff	1	-1	-2	-2	-4	-28	-107	31	36	0	4	30
% of Diff	50.0%	-100.0%	-200.0%	-100.0%	-100.0%	-254.5%	-172.6%	19.9%	28.6%	0.0%	4.4%	28.3%

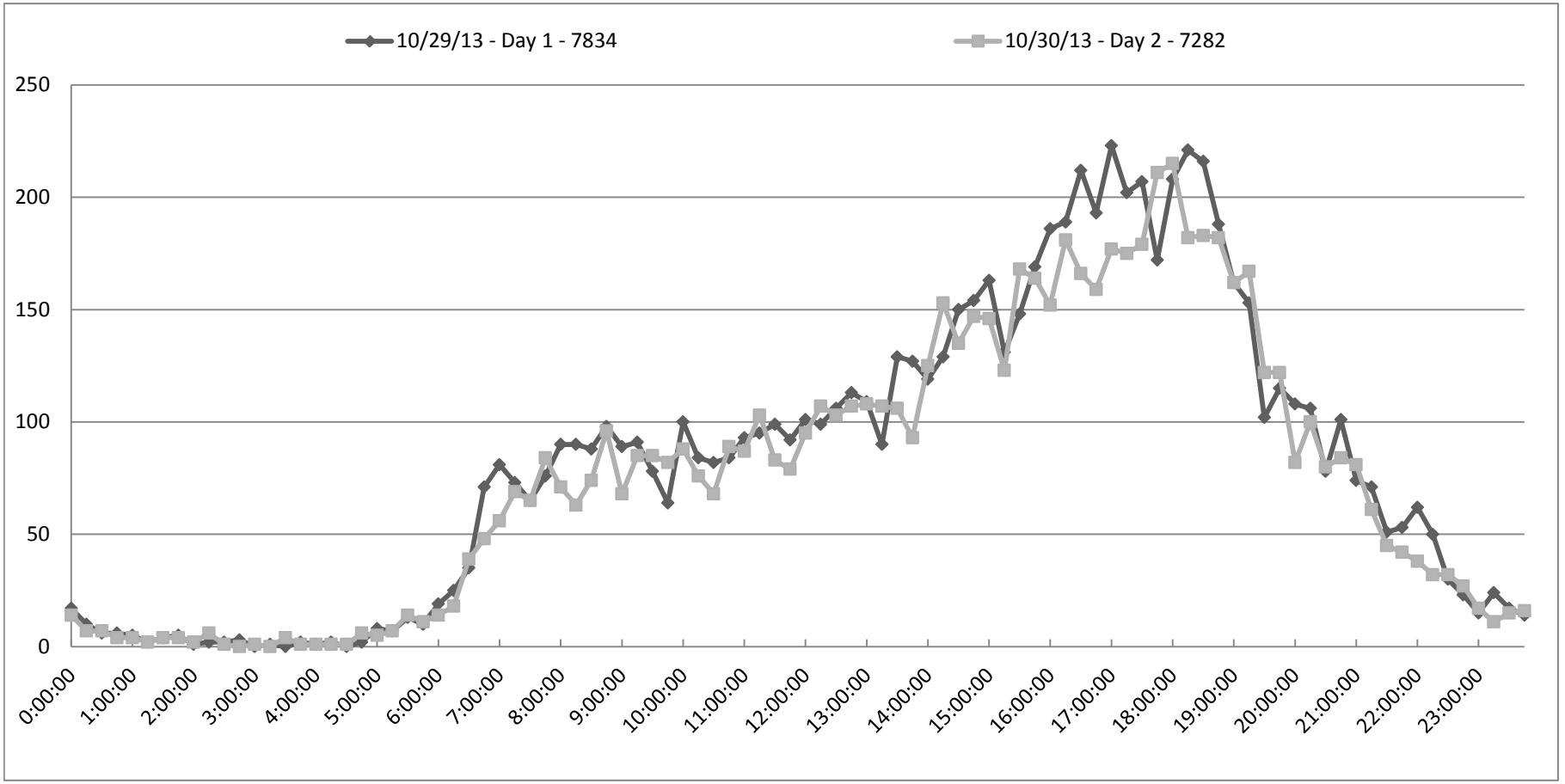
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	92	89	82	93	106	81	103	182	33	11	15	5
10/30/13 - Day 2	70	77	72	95	110	81	58	47	26	12	4	3
Diff	22	12	10	-2	-4	0	45	135	7	-1	11	2
% of Diff	23.9%	13.5%	12.2%	-2.2%	-3.8%	0.0%	43.7%	74.2%	21.2%	-9.1%	73.3%	40.0%



MoPac Expressway SB South of La Cross Avenue

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	39	16	8	3	5	38	150	295	366	322	350	379
10/30/13 - Day 2	14	13	5	4	32	82	238	292	334	314	362	384
Diff	25	3	3	-1	-27	-44	-88	3	32	8	-12	-5
% of Diff	64.1%	18.8%	37.5%	-33.3%	-540.0%	-115.8%	-58.7%	1.0%	8.7%	2.5%	-3.4%	-1.3%

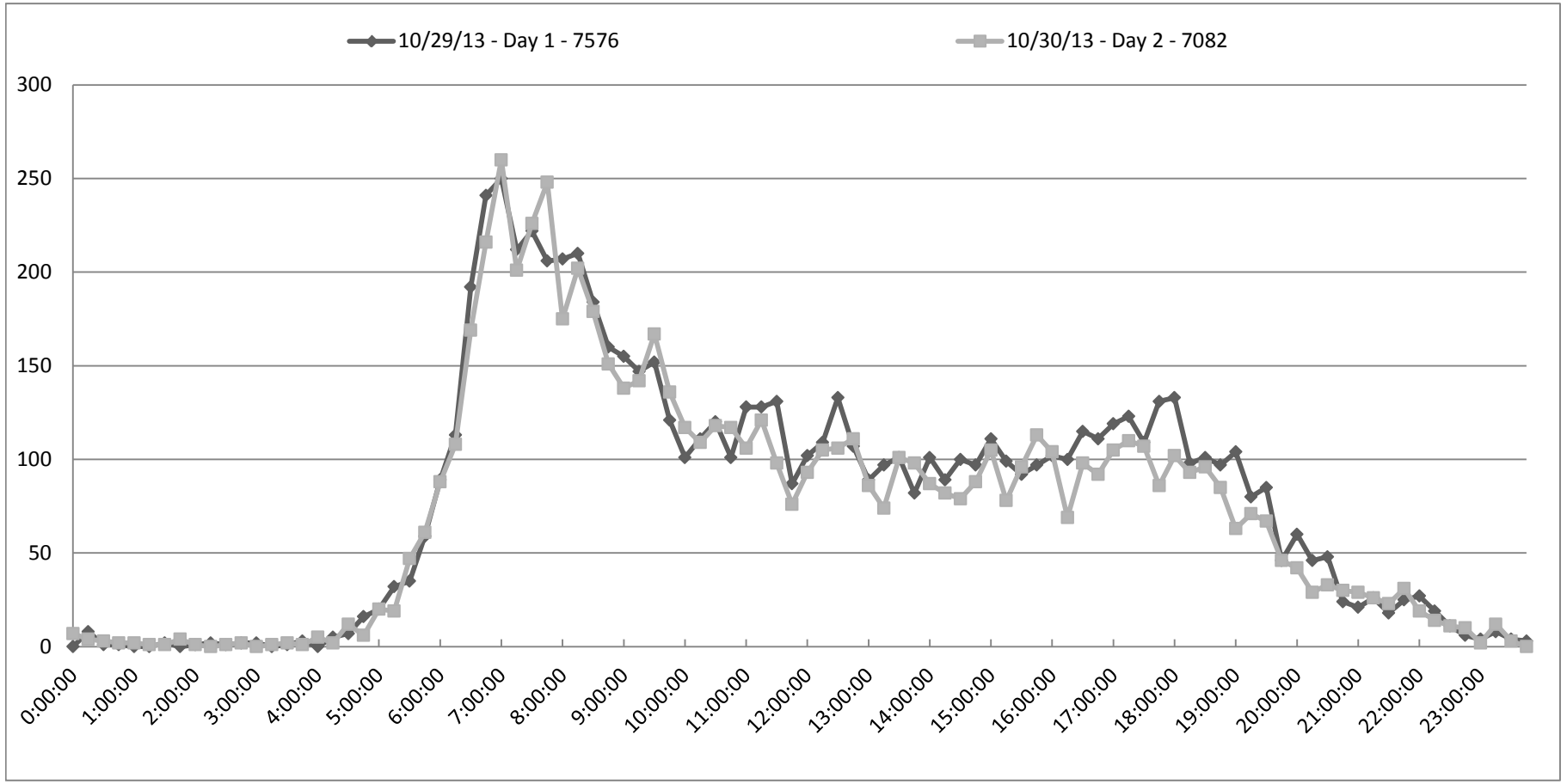
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	419	455	552	611	780	804	833	532	393	249	165	70
10/30/13 - Day 2	428	506	584	663	690	791	633	384	271	144	70	16
Diff	-9	-51	-32	-52	90	13	200	148	122	105	95	54
% of Diff	-2.1%	-11.2%	-5.8%	-8.5%	11.5%	1.6%	24.0%	27.8%	31.0%	42.2%	57.6%	77.1%



MoPac Expressway NB South of La Cross Avenue

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	10	2	6	6	28	146	635	890	761	575	433	474
10/30/13 - Day 2	6	6	5	20	92	426	903	804	598	480	442	380
Diff	4	-4	1	-14	-64	-280	-268	86	163	95	-9	94
% of Diff	40.0%	-200.0%	16.7%	-233.3%	-228.6%	-191.8%	-42.2%	9.7%	21.4%	16.5%	-2.1%	19.8%

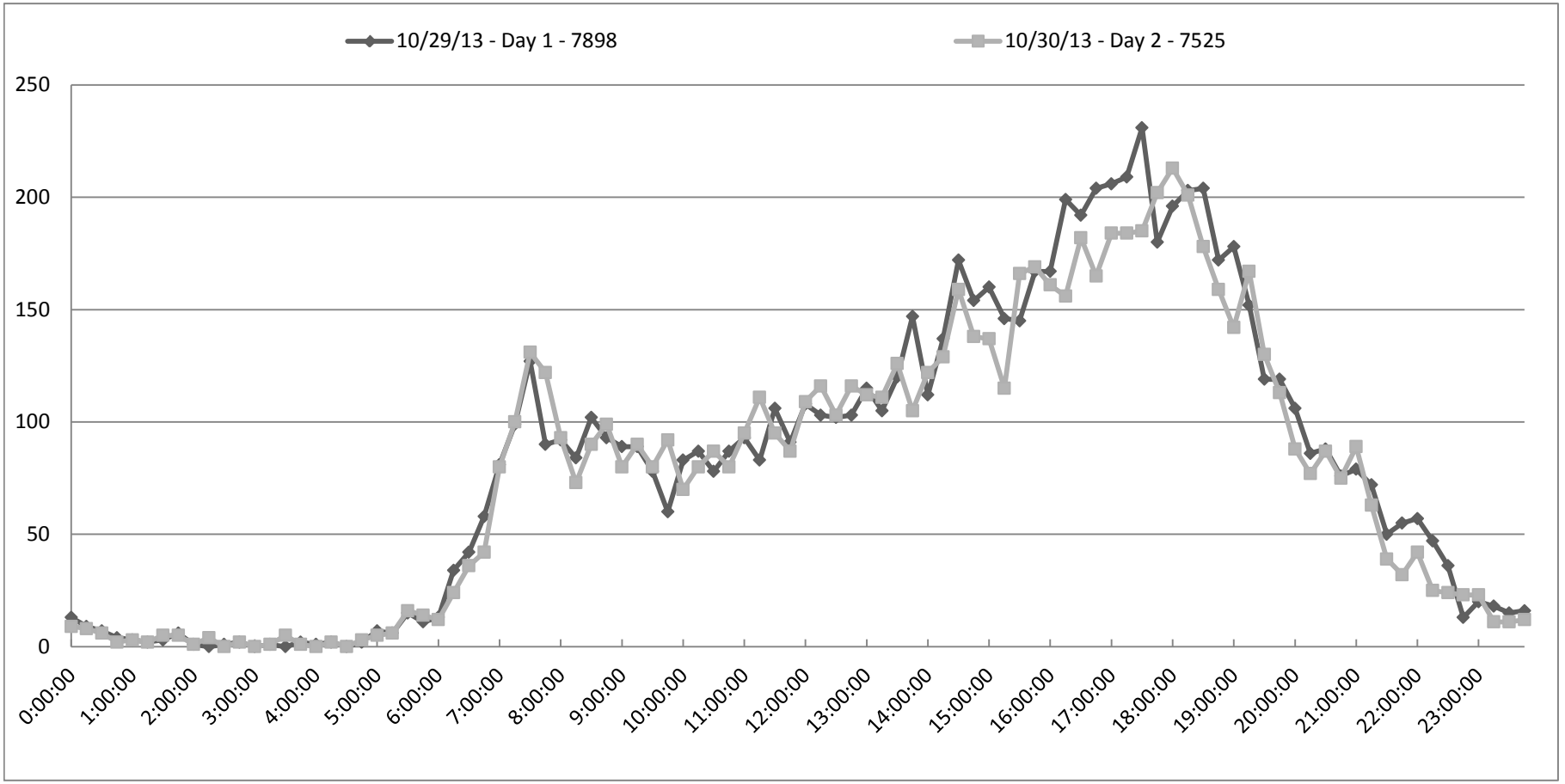
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	451	369	387	399	428	482	429	315	178	90	63	19
10/30/13 - Day 2	372	346	367	384	414	377	286	150	108	75	27	0
Diff	79	23	20	15	14	105	143	165	70	15	36	19
% of Diff	17.5%	6.2%	5.2%	3.8%	3.3%	21.8%	33.3%	52.4%	39.3%	16.7%	57.1%	100.0%



SH 45 WB East of FM 1826

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	33	14	4	3	5	39	147	397	371	316	335	373
10/30/13 - Day 2	12	10	8	3	30	86	353	378	349	329	381	415
Diff	21	4	-4	0	-25	-47	-206	19	22	-13	-46	-42
% of Diff	63.6%	28.6%	-100.0%	0.0%	-500.0%	-120.5%	-140.1%	4.8%	5.9%	-4.1%	-13.7%	-11.3%

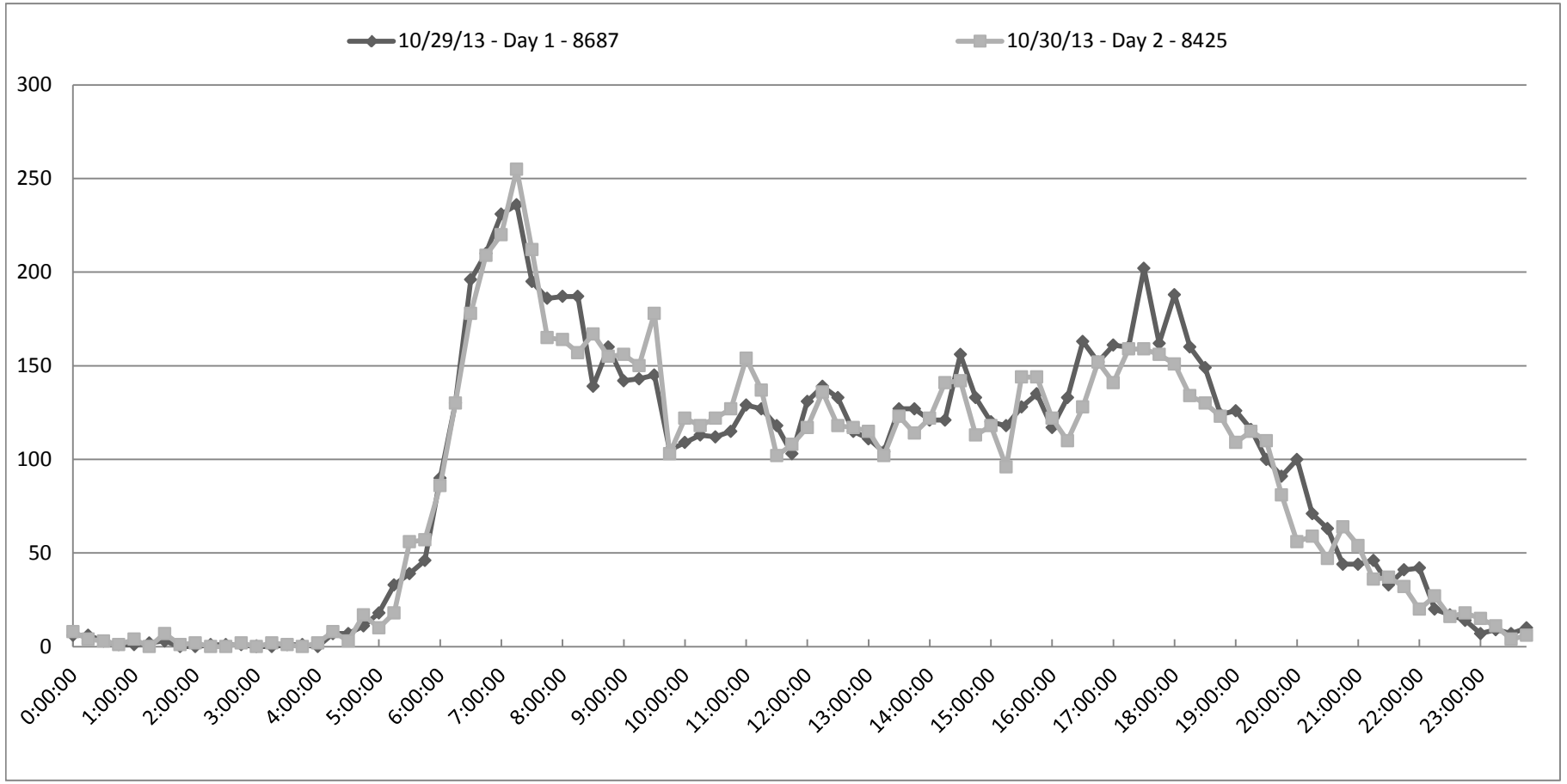
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	416	487	575	618	762	826	775	568	356	256	153	69
10/30/13 - Day 2	465	515	556	668	718	794	598	365	266	123	68	12
Diff	-49	-28	19	-50	44	32	177	203	90	133	85	57
% of Diff	-11.8%	-5.7%	3.3%	-8.1%	5.8%	3.9%	22.8%	35.7%	25.3%	52.0%	55.6%	82.6%



SH 45 EB East of FM 1826

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	16	6	3	2	25	136	626	848	673	535	449	477
10/30/13 - Day 2	12	3	5	13	101	451	896	653	639	465	520	479
Diff	4	3	-2	-11	-76	-315	-270	195	34	70	-71	-2
% of Diff	25.0%	50.0%	-66.7%	-550.0%	-304.0%	-231.6%	-43.1%	23.0%	5.1%	13.1%	-15.8%	-0.4%

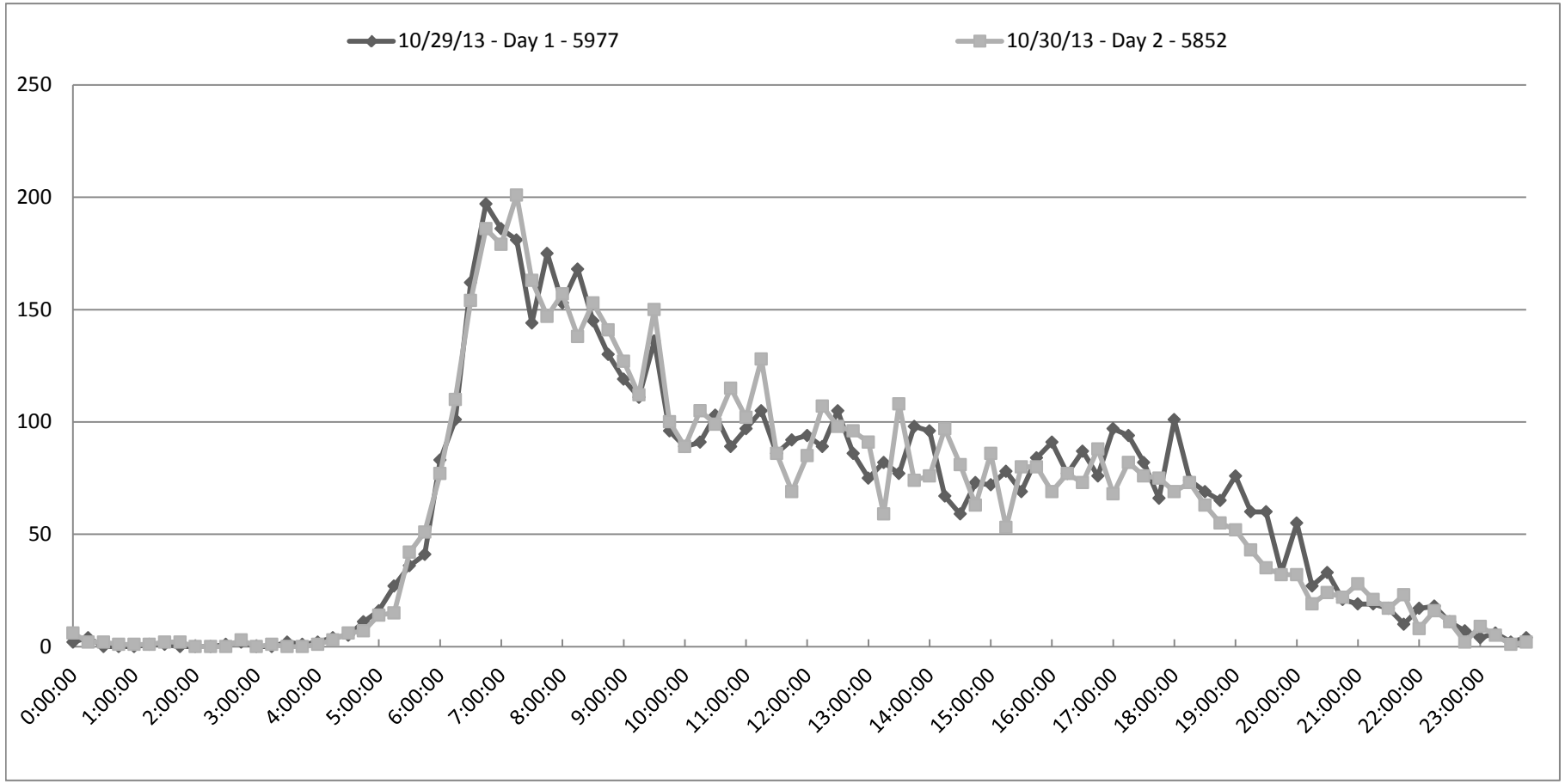
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	518	469	531	501	565	685	621	433	278	164	93	33
10/30/13 - Day 2	457	519	471	504	611	571	457	243	191	95	48	6
Diff	61	-50	60	-3	-46	114	164	190	87	69	45	27
% of Diff	11.8%	-10.7%	11.3%	-0.6%	-8.1%	16.6%	26.4%	43.9%	31.3%	42.1%	48.4%	81.8%



RM 1826 South of Dalea Drive

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	6	2	3	3	22	120	543	686	596	462	372	380
10/30/13 - Day 2	5	2	4	10	78	392	729	595	530	393	431	359
Diff	1	0	-1	-7	-56	-272	-186	91	66	69	-59	21
% of Diff	16.7%	0.0%	-33.3%	-233.3%	-254.5%	-226.7%	-34.3%	13.3%	11.1%	14.9%	-15.9%	5.5%

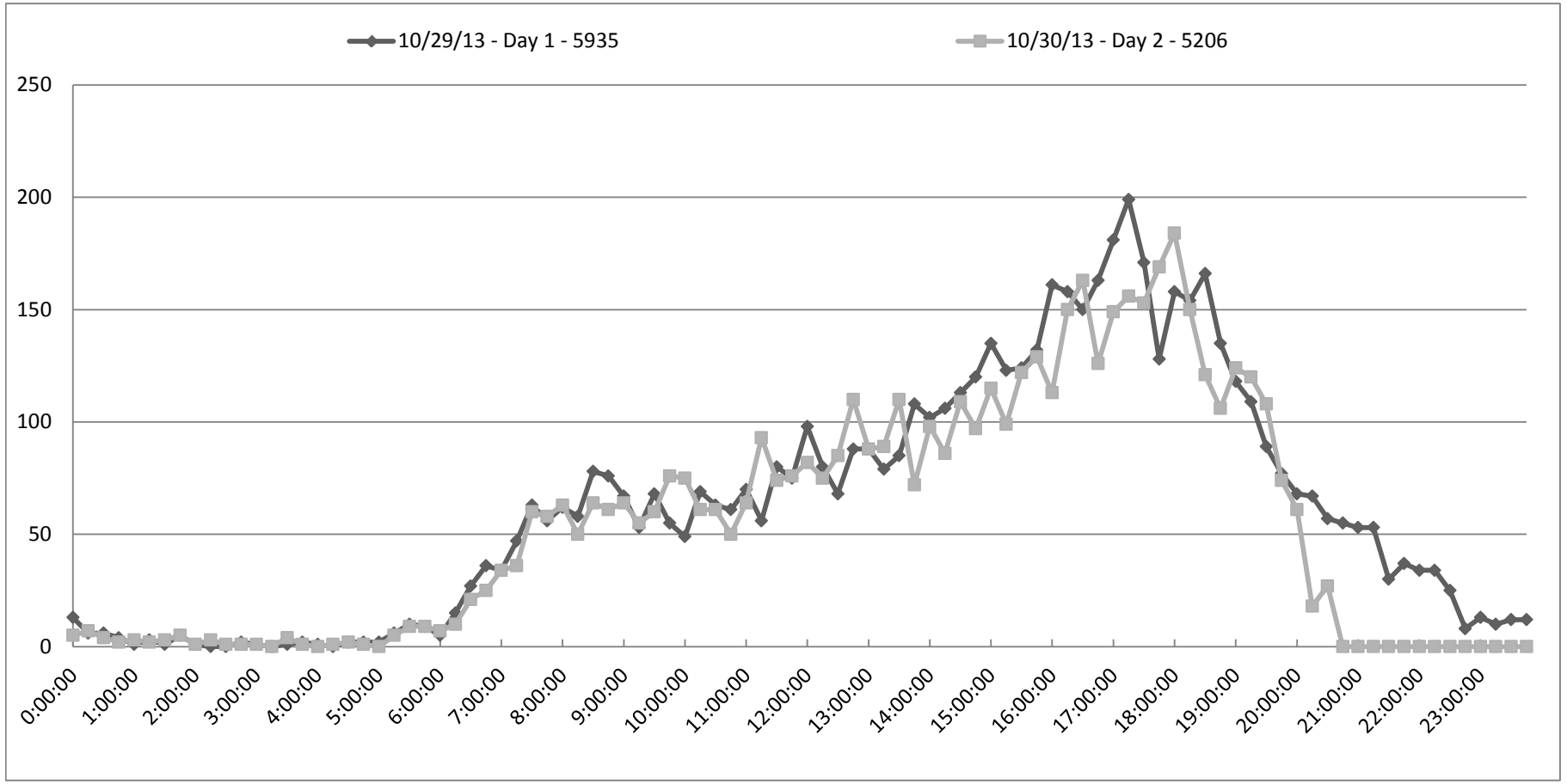
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	374	332	295	303	331	339	309	229	136	65	53	16
10/30/13 - Day 2	354	328	282	299	314	280	185	107	88	58	17	2
Diff	20	4	13	4	17	59	124	122	48	7	36	14
% of Diff	5.3%	1.2%	4.4%	1.3%	5.1%	17.4%	40.1%	53.3%	35.3%	10.8%	67.9%	87.5%



RM 1826 South of Dalea Drive

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	29	10	3	4	5	27	83	200	274	243	242	281
10/30/13 - Day 2	10	10	6	4	15	47	155	235	240	273	281	318
Diff	19	0	-3	0	-10	-20	-72	-35	34	-30	-39	-37
% of Diff	65.5%	0.0%	-100.0%	0.0%	-200.0%	-74.1%	-86.7%	-17.5%	12.4%	-12.3%	-16.1%	-13.2%

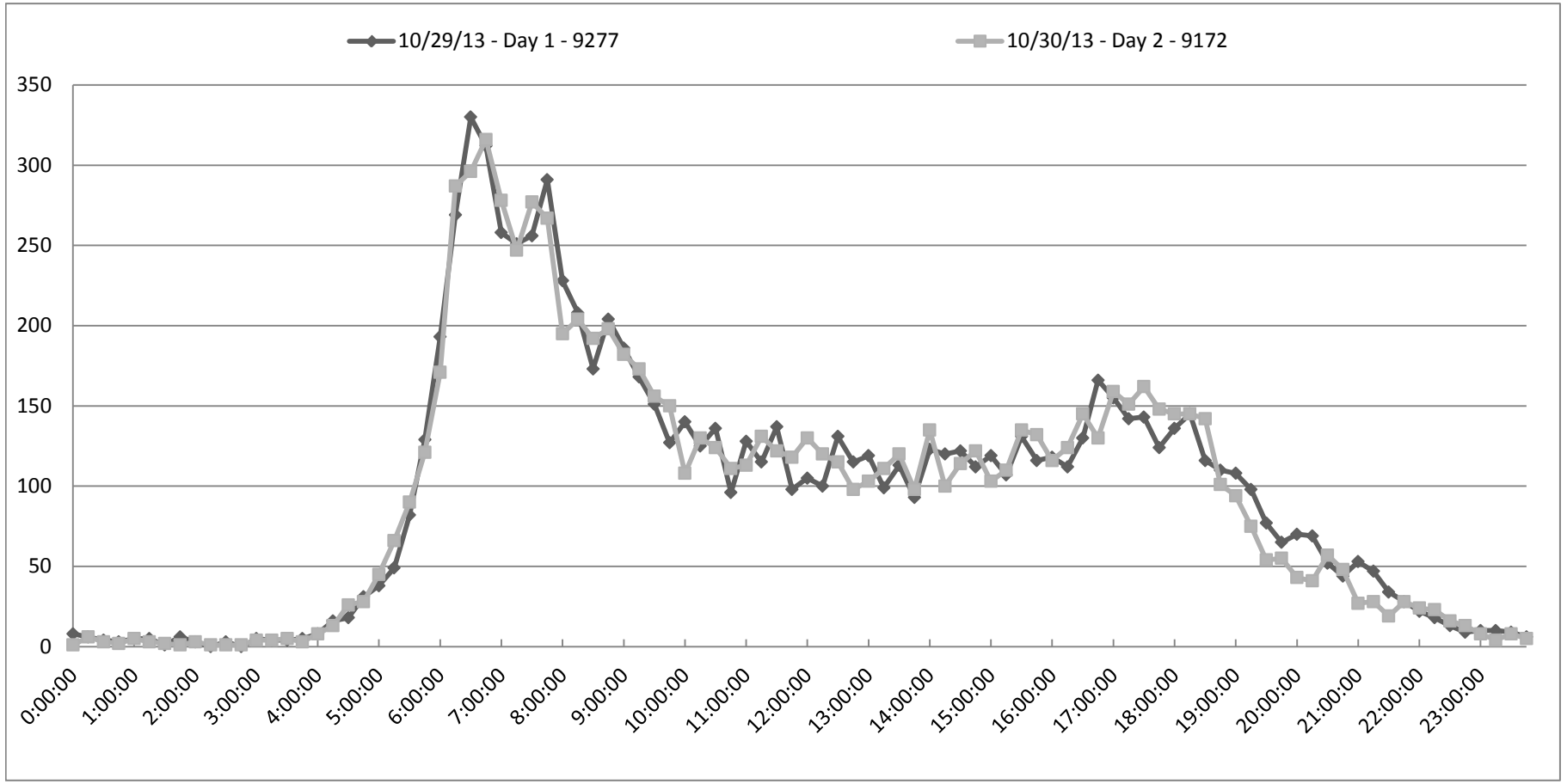
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	334	360	441	514	632	679	613	393	247	173	101	47
10/30/13 - Day 2	397	365	433	555	584	624	458	180	0	0	0	0
Diff	-63	-5	8	-41	48	55	155	213	247	173	101	47
% of Diff	-18.9%	-1.4%	1.8%	-8.0%	7.6%	8.1%	25.3%	54.2%	100.0%	100.0%	100.0%	100.0%



FM 1626 - NB South of Brodie Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	21	17	6	18	73	298	1104	1056	813	632	497	478
10/30/13 - Day 2	12	6	14	50	229	875	1118	858	709	512	477	483
Diff	9	11	-8	-32	-156	-577	-14	198	104	120	20	-5
% of Diff	42.9%	64.7%	-133.3%	-177.8%	-213.7%	-193.6%	-1.3%	18.8%	12.8%	19.0%	4.0%	-1.0%

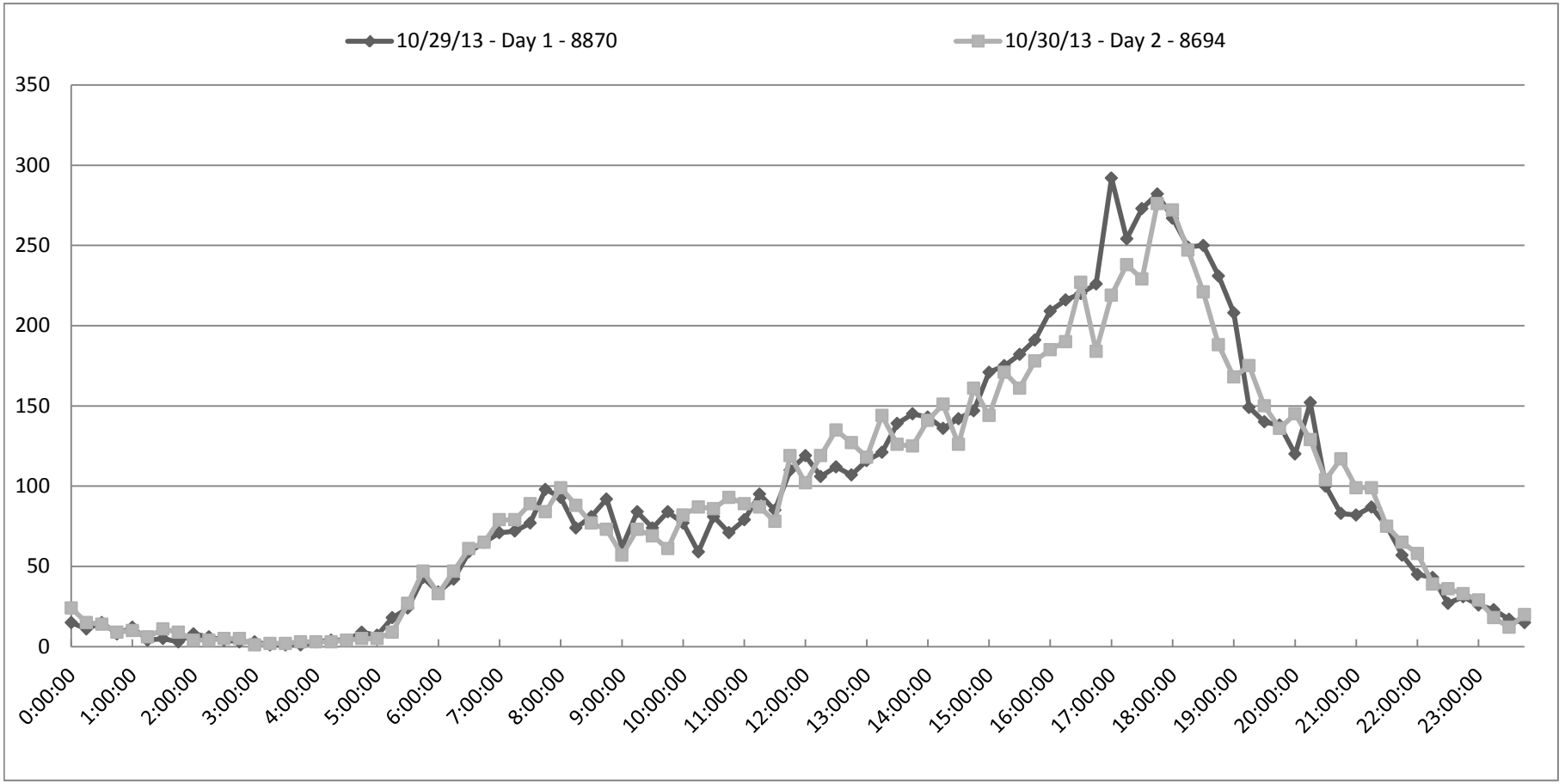
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	451	424	477	473	526	564	507	348	235	162	62	35
10/30/13 - Day 2	432	447	470	517	602	580	324	196	122	91	33	5
Diff	19	-23	7	-44	-76	-16	183	152	113	71	29	30
% of Diff	4.2%	-5.4%	1.5%	-9.3%	-14.4%	-2.8%	36.1%	43.7%	48.1%	43.8%	46.8%	85.7%

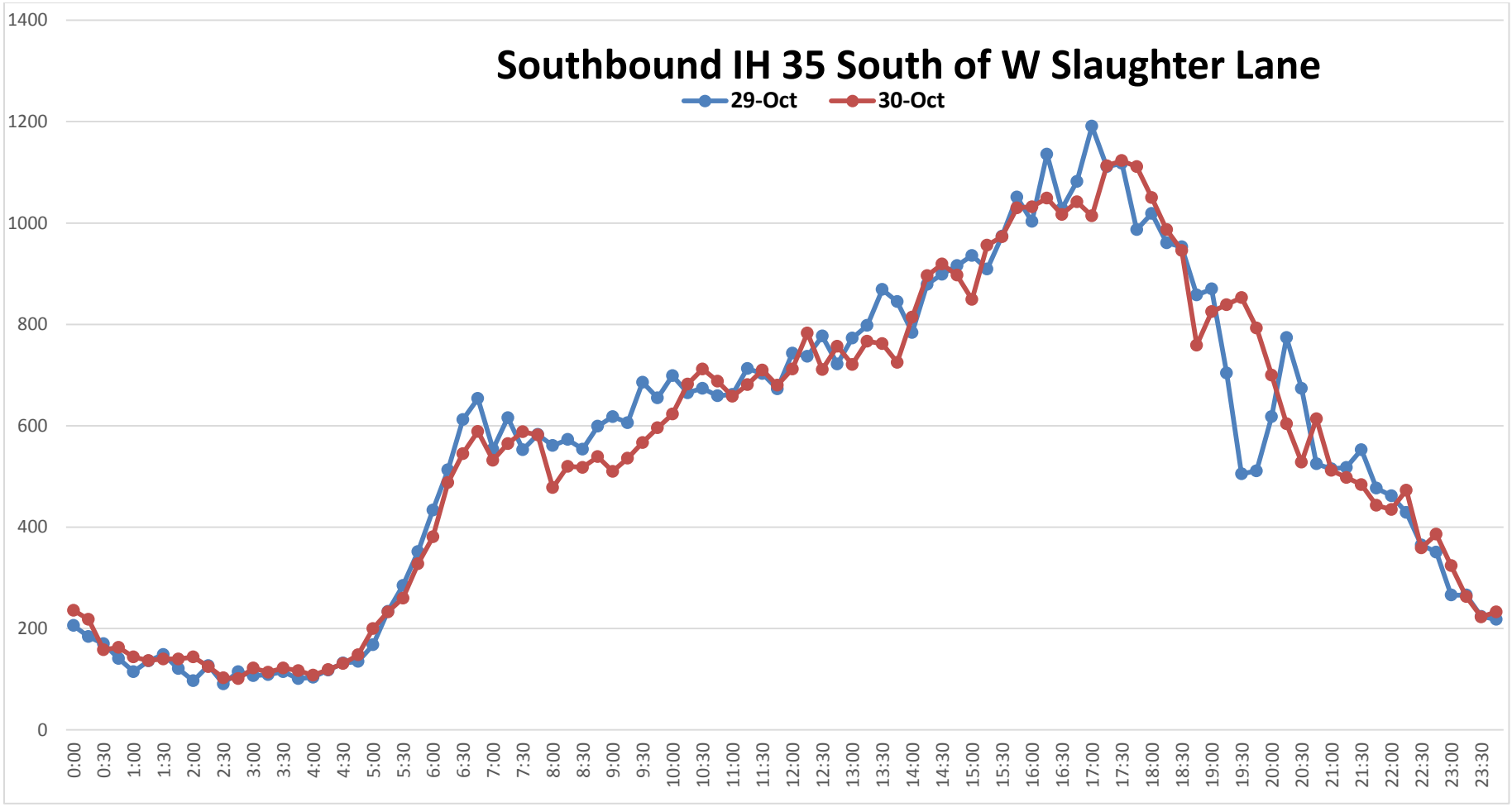


FM 1626 - SB South of Brodie Lane

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
10/29/13 - Day 1	49	24	21	6	20	92	200	318	340	304	288	369
10/30/13 - Day 2	36	22	10	13	46	188	312	348	272	316	347	475
Diff	13	2	11	-7	-26	-96	-112	-30	68	-12	-59	-106
% of Diff	26.5%	8.3%	52.4%	-116.7%	-130.0%	-104.3%	-56.0%	-9.4%	20.0%	-3.9%	-20.5%	-28.7%

	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
10/29/13 - Day 1	444	521	568	719	871	1101	997	635	455	301	146	81
10/30/13 - Day 2	515	543	637	780	870	1016	681	514	390	198	92	20
Diff	-71	-22	-69	-61	1	85	316	121	65	103	54	61
% of Diff	-16.0%	-4.2%	-12.1%	-8.5%	0.1%	7.7%	31.7%	19.1%	14.3%	34.2%	37.0%	75.3%




Southbound IH 35 South of W Slaughter Lane
29-Oct
30-Oct
1400
1200
1000
800
600
400
200
0
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1:00
1:30
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23:30

Appendix B –SH45SW/BRODIE LANE AREA

Video License Plate Capture

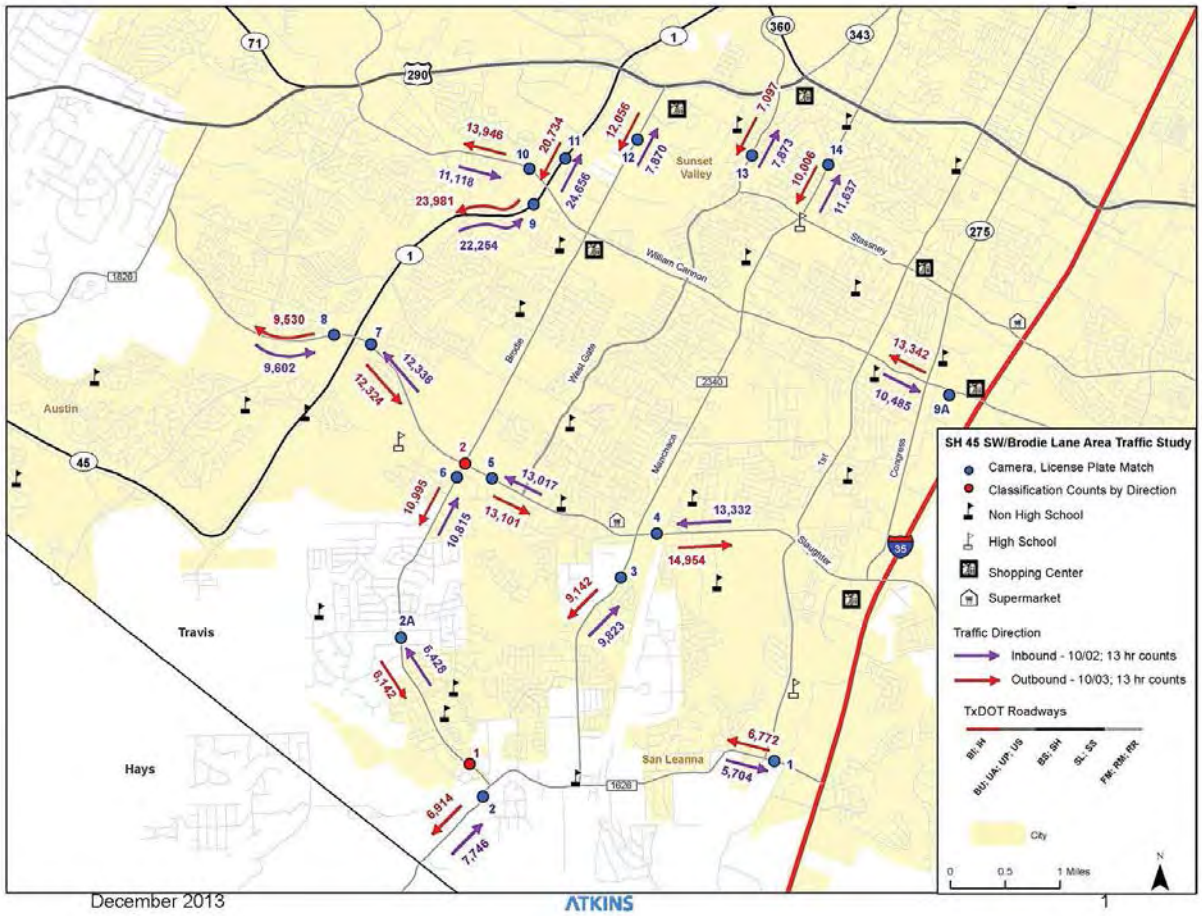
DRAFT

SH-45SW and Brodie Lane License Plate Survey Summary

In October 2013 TTI conducted a vehicle license plate capture survey for the Brodie Lane and SH-45/Mopac area in southwest Austin. Video cameras were placed at strategic locations throughout the study area to gain insight of traffic distribution patterns throughout the study area. This summary provides the distribution results only for the FM 1626 facility with respect to Brodie Lane, Slaughter Lane, and Mopac. The complete survey results are contained in the report following this summary.

At the time of the video survey the traffic volume on FM 1626 just south of Brodie Lane was approximately 18,000 vehicles per day. The video survey lasted 13 hours (6:00am to 7:00pm) and recorded 14,660 license plates, approximately 81% of the daily traffic (14,660/18,000). Of the 14,660 vehicles surveyed, approximately 2,700 vehicles recorded a license plate match with some other video site in the study area. These matches represent through trips from the FM 1626 site location for both inbound and outbound traffic. Dividing 2,700 by 14,660 results in approximately 18.5% of the recorded vehicle license plates at FM 1626 being categorized as "through" trips – meaning the vehicle was seen at some other video location site.

The figure below provides the location of the FM 1626 video site (#2) as well as the other video sites.



The table below summarizes the distribution (by percentage) to/from FM 1626 to/from the following video sites:

- #2A – Brodie Lane between Slaughter Lane and FM 1626
- #6 – Brodie Lane just south of Slaughter Lane
- #7 – Slaughter Lane just east of Mopac
- #9 – Mopac just south of William Cannon Drive
- #11 – Mopac just north of William Cannon

FM 1626 Distribution Percentages of Through Trips						
Location	**Site #2A**	**Site #6**	**Site #7**	**Site #9**	**Site #11**	**Total**
Site #2, From/To FM 1626 to	15%	22%	8%	10%	6%	61%

- **Site 2A -** 15% of the FM 1626 through trips were made between Site #2 and Site #2a. This is likely from school drop off and pick up activity and after-school activities.
- **Site #6 -** 22% of the FM 1626 through trips were made between Site #2 and Site #6. These trips either proceeded north on Brodie Lane or turned left onto Slaughter to head east.
- **Site #7 -** 8% of the FM 1626 through trips were made between Site #2 and Site #7. These trips either continued west on Slaughter, turned left on Mopac to head south or turned right on Mopac to head north but exited Mopac at Davis Lane.
- **Site #9 -** 10% of the FM 1626 through trips were made between Site #2 and Site #9. These trips utilized Brodie Lane and Slaughter Lane to access William Cannon via Mopac.
- **Site #11 -** 6% of the FM 1626 through trips were made between Site #2 and Site #11. These trips utilized Brodie Lane and Slaughter to access all points north of William Cannon via Mopac.

Approximately 61% of the total through trips from/to FM 1626 at Site #2 utilized Brodie Lane to conduct their travel. Sites #7, #9, and #11 are likely candidates to utilize the proposed SH45SW facility – approximately 24% of the through trips currently utilizing Brodie Lane. The 24% of the FM 1626 through trips equate to approximately 7% to 12% of the current traffic volume on Brodie lane.

SH 45 SW/BRODIE LANE AREA

TRAFFIC ENGINEERING STUDY

AUSTIN, TEXAS

Prepared For:

Texas Department of Transportation

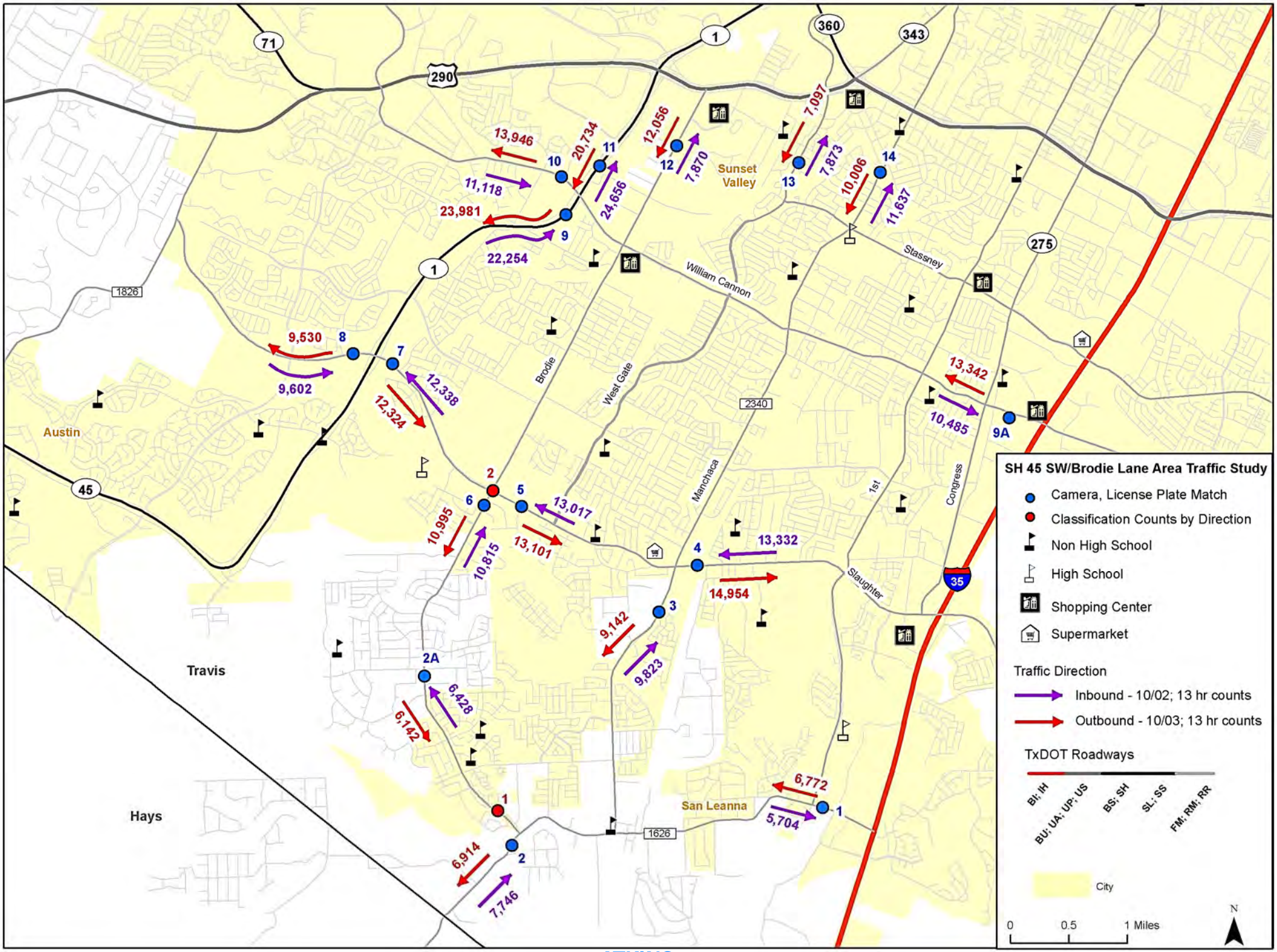
Prepared by:

ATKINS

6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

DRAFT

December 2013


SH 45 SW/Brodie Lane Area Traffic Study
Camera, License Plate Match
Classification Counts by Direction
Non High School
High School
Shopping Center
Supermarket
Traffic Direction
Inbound - 10/02; 13 hr counts
Outbound - 10/03; 13 hr counts
TxDOT Roadways
BI; IH
BU; UA; UP; US
BS; SH
SL; SS
FM; RM; RR
City
0
0.5
1 Miles
N
Austin
Travis
Hays
Sunset Valley
San Leanna
William Cannon
Stassney
Brodie
West Gate
Manchaca
1st
Congress
Slaughter
71
290
1
360
343
275
35
45
1826
2340
1626
13,946
20,734
11,118
24,656
23,981
22,254
12,056
7,870
7,097
7,873
10,006
11,637
9,530
9,602
12,324
12,338
13,342
10,485
10,995
10,815
13,017
13,101
13,332
14,954
9,142
9,823
6,428
6,142
6,772
5,704
6,914
7,746

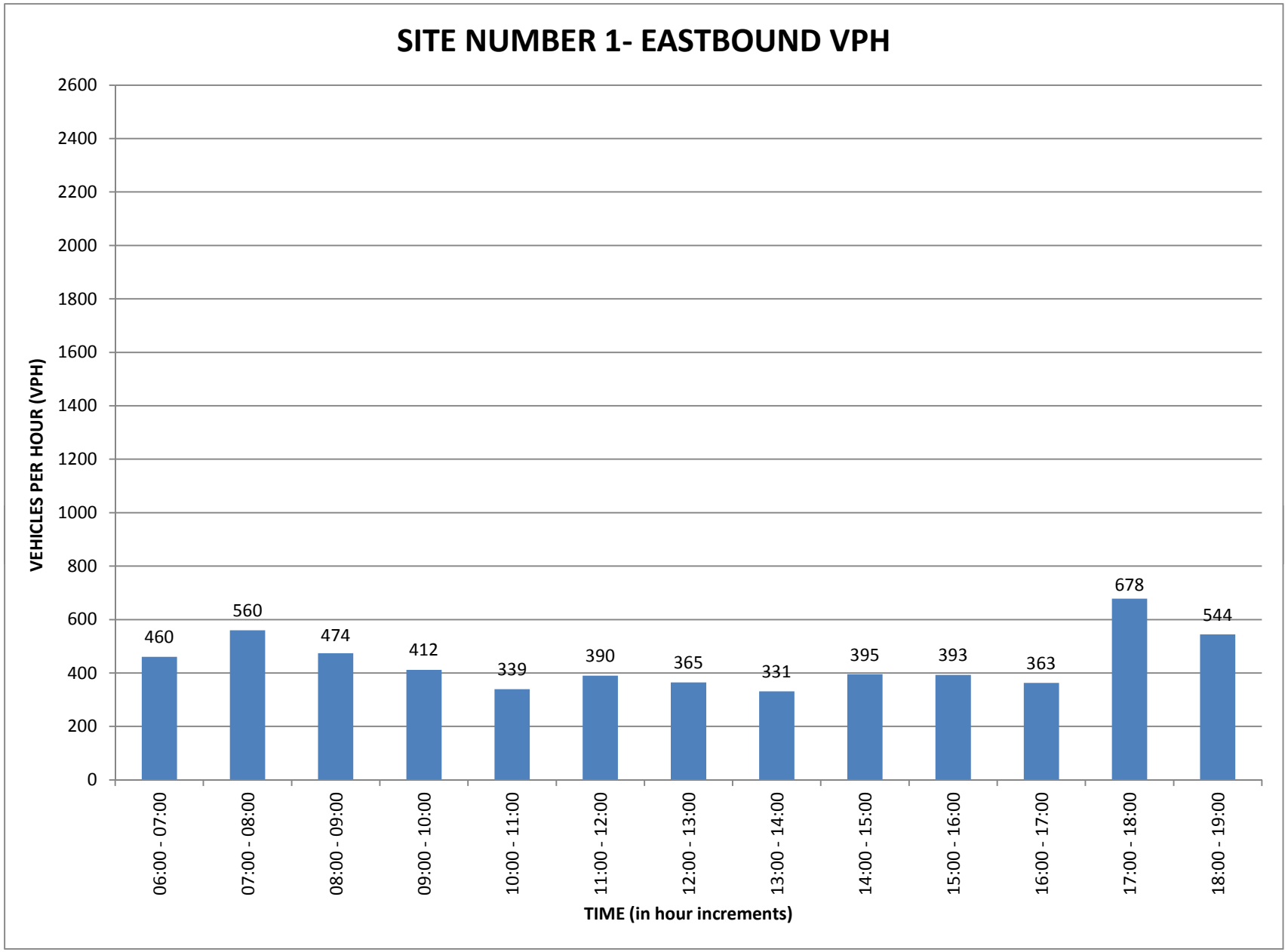
ATKINS

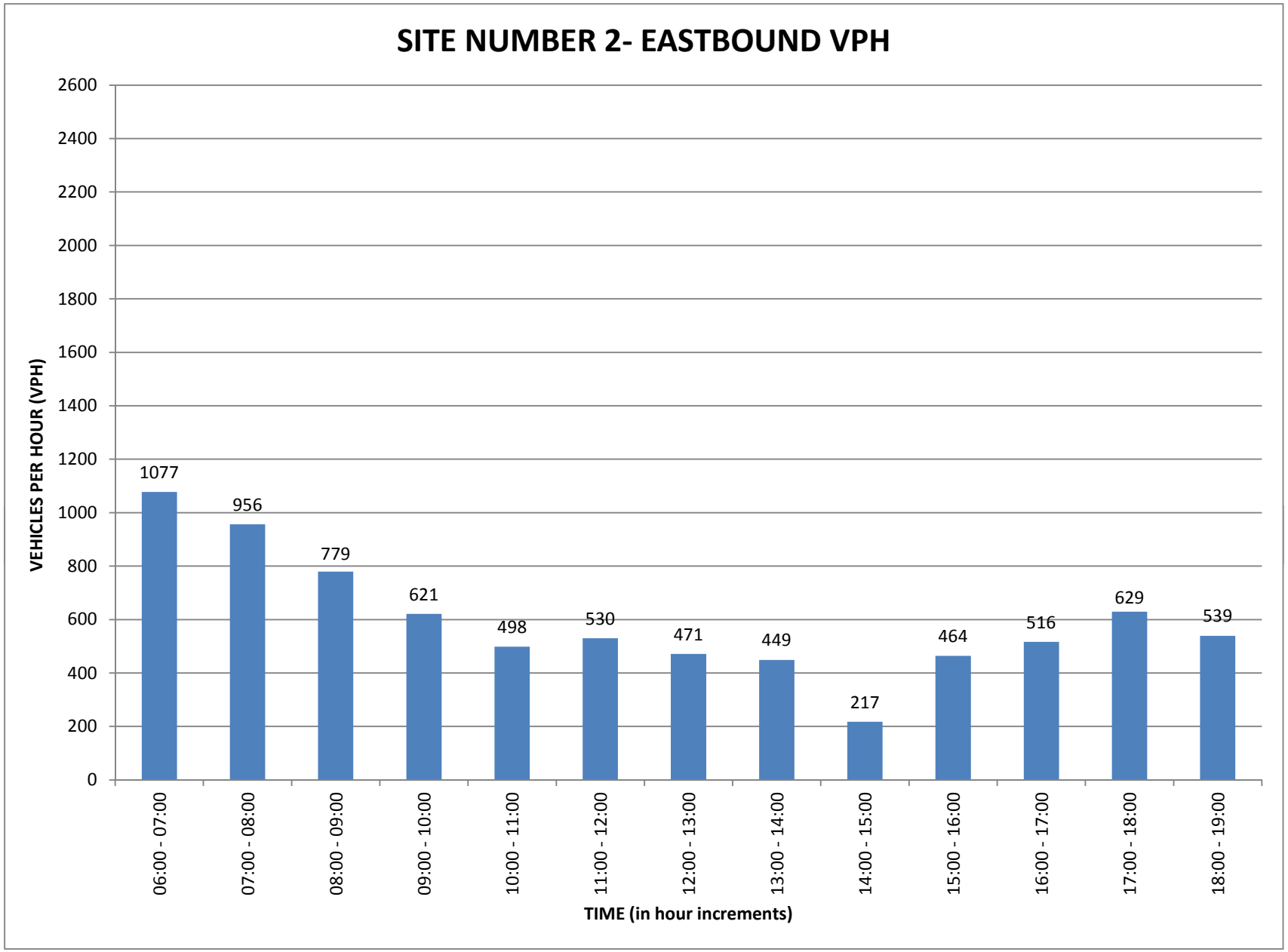
Inbound 13 Hour ALPR O-D Matrix Table (10/02/2013 Plate Collection Commenced at 6 am)																		
		Destination Location																Total
		1	2	2A	3	4	5	6	7	8	9	9A	10	11	12	13	14	
Origin Location	1	0	2	0	6	11	7	3	1	2	0	2	0	1	2	1	0	38
	2	134	0	356	18	23	34	434	169	21	160	7	13	98	75	11	35	1,588
	2A	4	3	0	4	3	10	214	79	15	70	2	4	39	27	3	3	480
	3	14	216	9	0	145	270	13	124	23	83	20	14	55	29	50	178	1,243
	4	22	9	10	68	0	932	26	411	53	200	38	26	152	55	37	78	2,117
	5	5	6	7	15	14	0	26	426	52	278	5	22	165	37	16	10	1,084
	6	5	13	25	3	16	59	0	175	34	226	5	22	157	116	13	11	880
	7	0	4	6	2	2	4	19	0	54	290	0	20	198	8	3	0	610
	8	5	5	16	13	18	61	23	174	0	748	7	31	424	37	6	0	1,568
	9	0	4	3	5	8	13	9	23	10	0	7	66	1,263	33	21	0	1,465
	9A	0	0	1	6	18	9	0	1	0	0	0	5	5	2	3	0	50
	10	6	2	3	6	5	9	5	18	8	19	70	0	548	65	22	0	786
	11	0	1	0	2	1	1	1	2	1	8	0	9	0	6	2	0	34
	12	1	1	2	5	4	12	2	5	3	8	4	4	11	0	9	0	71
	13	1	0	0	4	4	6	2	2	1	4	8	4	10	2	0	0	48
	14	3	1	0	9	11	6	0	4	3	3	16	6	6	3	13	0	84
Total		200	267	438	166	283	1,433	777	1,614	280	2,097	191	246	3,132	497	210	315	12,146

Outbound 13 Hour ALPR O-D Matrix Table (10/03/2013 Plate Collection Commenced at 6 am)																		
		Destination Location																Total
		1	2	2A	3	4	5	6	7	8	9	9A	10	11	12	13	14	
Origin Location	1	0	141	12	17	41	12	8	3	14	3	7	5	3	7	4	1	278
	2	16	0	13	2	4	0	4	2	2	0	1	1	0	3	0	1	49
	2A	2	44	0	2	6	5	40	4	2	5	0	2	1	2	0	0	115
	3	4	111	7	0	131	118	8	55	20	41	7	8	26	5	11	34	586
	4	19	11	6	66	0	16	16	9	8	6	13	5	4	2	3	6	190
	5	11	9	13	52	420	0	54	19	21	12	8	10	7	10	2	7	655
	6	2	172	377	5	22	44	0	36	23	12	0	4	7	8	2	0	714
	7	4	53	120	50	246	471	164	0	134	33	1	14	18	12	3	0	1,323
	8	2	12	23	15	49	82	52	131	0	18	1	7	8	2	4	1	407
	9	3	107	224	75	176	403	345	732	533	0	2	31	16	14	3	2	2,666
	9A	9	12	8	28	43	14	16	3	9	23	0	78	5	8	7	0	263
	10	4	5	12	17	22	41	19	37	18	89	3	0	17	6	8	0	298
	11	3	53	110	38	104	201	193	325	396	1,551	10	680	0	42	10	0	3,716
	12	1	54	129	19	72	97	175	19	63	83	5	128	11	0	7	0	863
	13	2	16	18	40	41	22	31	4	16	12	6	48	2	7	0	0	265
	14	5	18	8	85	90	20	15	2	10	13	5	20	5	15	34	0	345
Total		87	818	1,080	511	1,467	1,546	1,140	1,381	1,269	1,901	69	1,041	130	143	98	52	12,733

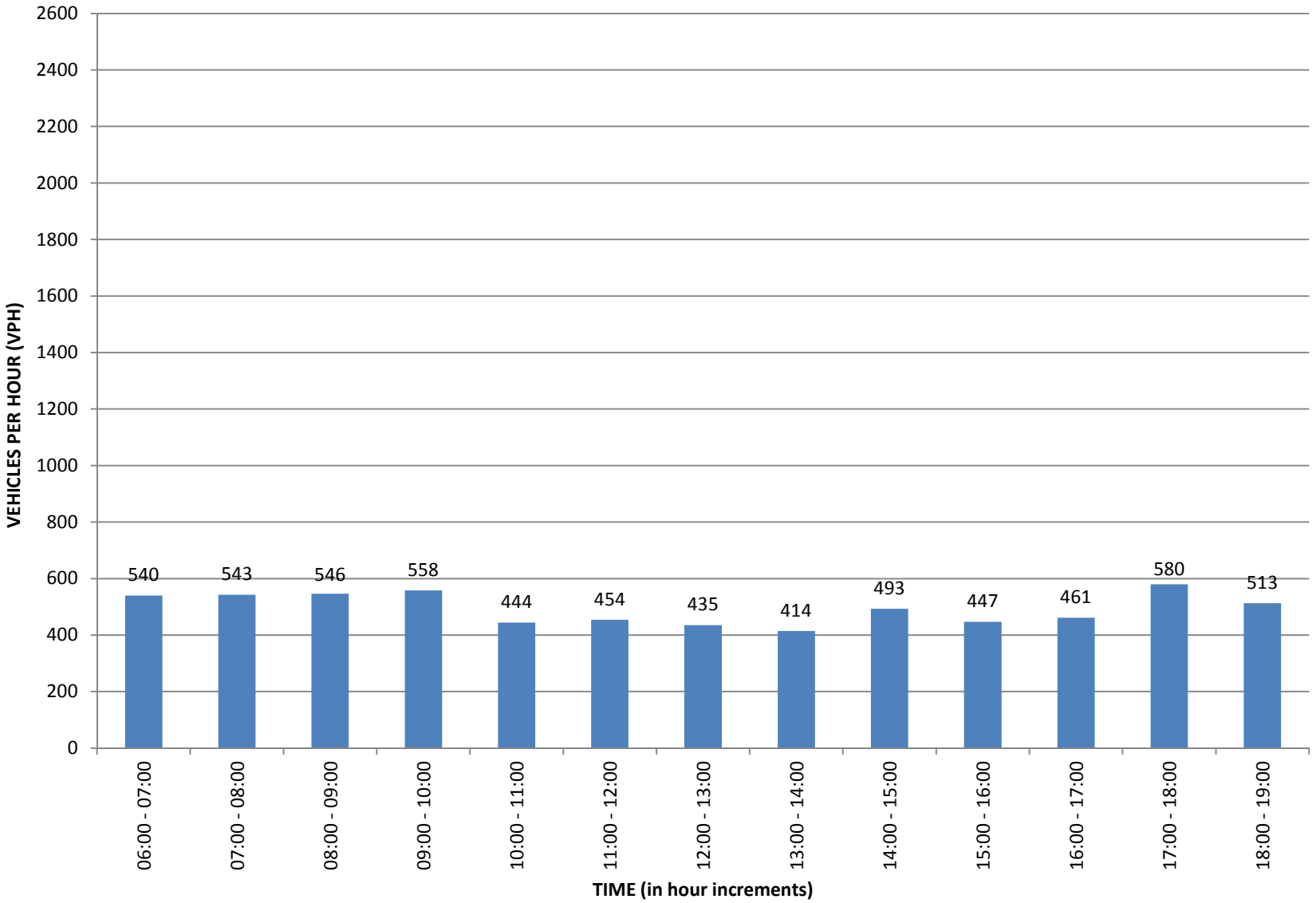
Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						
				6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13
1	FM 1626 between S. 1st Street and Old San Antonio Road	E	10-02	460	560	474	412	339	390	365
2	FM 1626 between Brodie Ln and Johnson Ln (south)	E	10-02	1077	956	779	621	498	530	471
2A	Brodie Ln between Green Emerald and Twilight	N	10-02	540	543	546	558	444	454	435
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	N	10-02	1098	1197	697	504	701	624	601
4	Slaughter Ln just east of Manchaca Rd/FM 2304	W	10-02	697	1266	1015	885	859	865	890
5	Slaughter Ln just east of Brodie Ln	W	10-02	782	1375	1158	952	797	779	944
6	Brodie Ln just south of Slaughter Ln	N	10-02	1003	1241	1070	991	811	688	666
7	Slaughter Ln just east of Loop 1 (MoPac)	W	10-02	975	1229	1091	664	722	849	957
8	Slaughter Ln just west of Loop 1 (MoPac)	E	10-02	471	1017	966	719	621	668	674
9	Loop 1 (MoPac) just south of William Cannon	N	10-02	1595	2340	2262	2156	1696	1518	1511
9A	William Cannon just west of IH 34	E	10-02	566	864	641	611	615	727	824
10	William Cannon just west of Loop 1 (Mopac)	E	10-02	493	674	722	773	599	642	1013
11	Loop 1 (MoPac) just north of William Cannon	N	10-02	2090	1924	1992	2545	1991	1833	1654
12	Brodie Ln between US 290/71/Ben White & William Cannon	N	10-02	445	987	721	572	305	349	1035
13	Westgate between Jones Rd and West Stasney Ln	N	10-02	455	1292	1095	586	472	453	536
14	Manchaca Rd just north of Jones Rd	N	10-02	1329	1691	1310	839	715	750	808

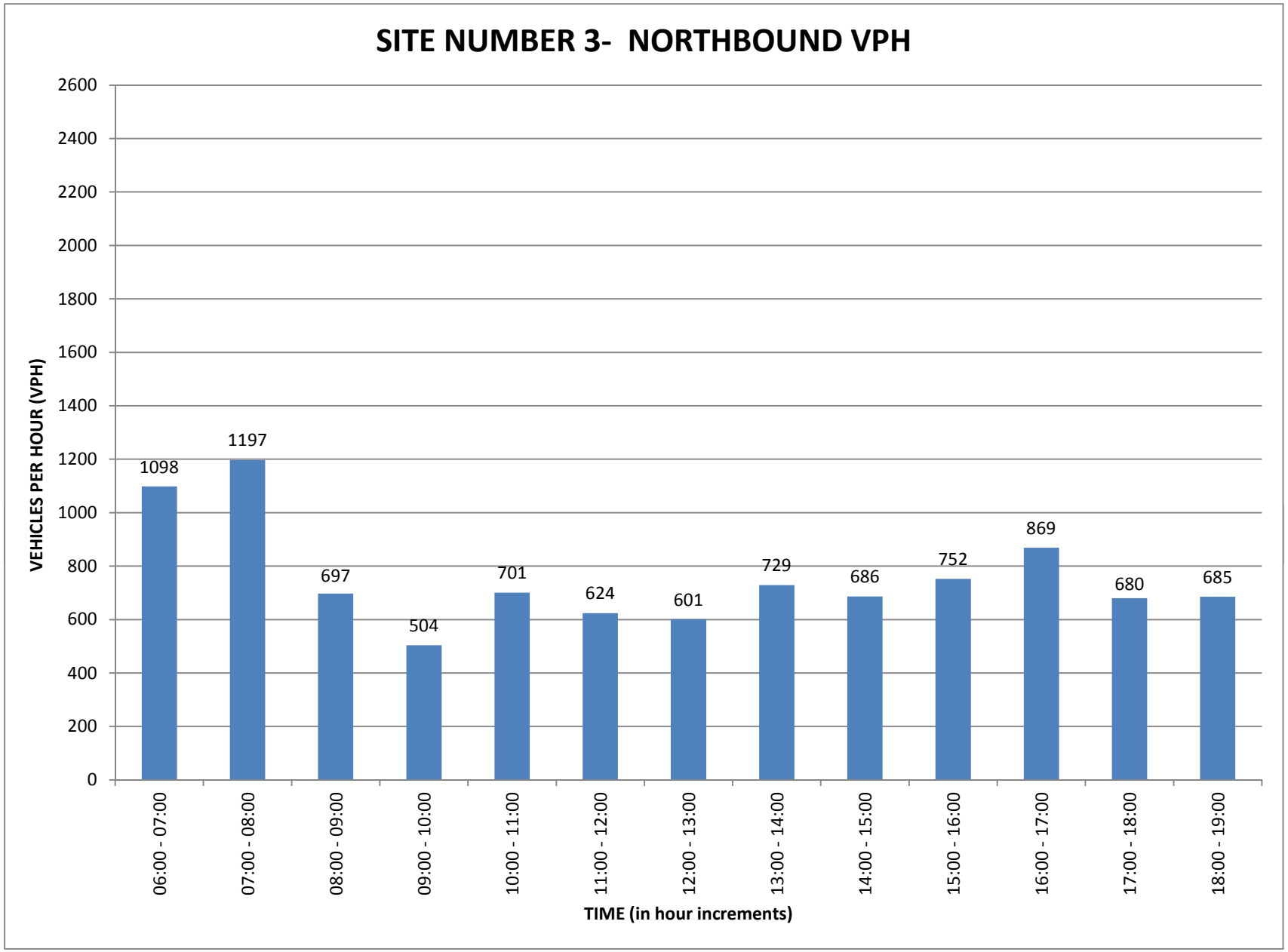
Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						13 HR TOTAL
				13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	
1	FM 1626 between S. 1st Street and Old San Antonio Road	E	10-02	331	395	393	363	678	544	**5,704**
2	FM 1626 between Brodie Ln and Johnson Ln (south)	E	10-02	449	217	464	516	629	539	**7,746**
2A	Brodie Ln between Green Emerald and Twilight	N	10-02	414	493	447	461	580	513	**6,428**
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	N	10-02	729	686	752	869	680	685	**9,823**
4	Slaughter Ln just east of Manchaca Rd/FM 2304	W	10-02	878	981	1173	1138	1364	1321	**13,332**
5	Slaughter Ln just east of Brodie Ln	W	10-02	950	986	1007	1130	1171	986	**13,017**
6	Brodie Ln just south of Slaughter Ln	N	10-02	722	734	704	702	796	687	**10,815**
7	Slaughter Ln just east of Loop 1 (MoPac)	W	10-02	951	949	827	1105	1102	917	**12,338**
8	Slaughter Ln just west of Loop 1 (MoPac)	E	10-02	625	601	751	820	872	797	**9,602**
9	Loop 1 (MoPac) just south of William Cannon	N	10-02	1508	1407	1470	1622	1641	1528	**22,254**
9A	William Cannon just west of IH 34	E	10-02	820	856	951	1030	1039	941	**10,485**
10	William Cannon just west of Loop 1 (Mopac)	E	10-02	787	1098	1024	1024	1176	1093	**11,118**
11	Loop 1 (MoPac) just north of William Cannon	N	10-02	2092	1882	1788	1695	1735	1435	**24,656**
12	Brodie Ln between US 290/71/Ben White & William Cannon	N	10-02	937	667	299	327	403	823	**7,870**
13	Westgate between Jones Rd and West Stasney Ln	N	10-02	535	547	467	432	498	505	**7,873**
14	Manchaca Rd just north of Jones Rd	N	10-02	802	822	667	787	814	303	**11,637**

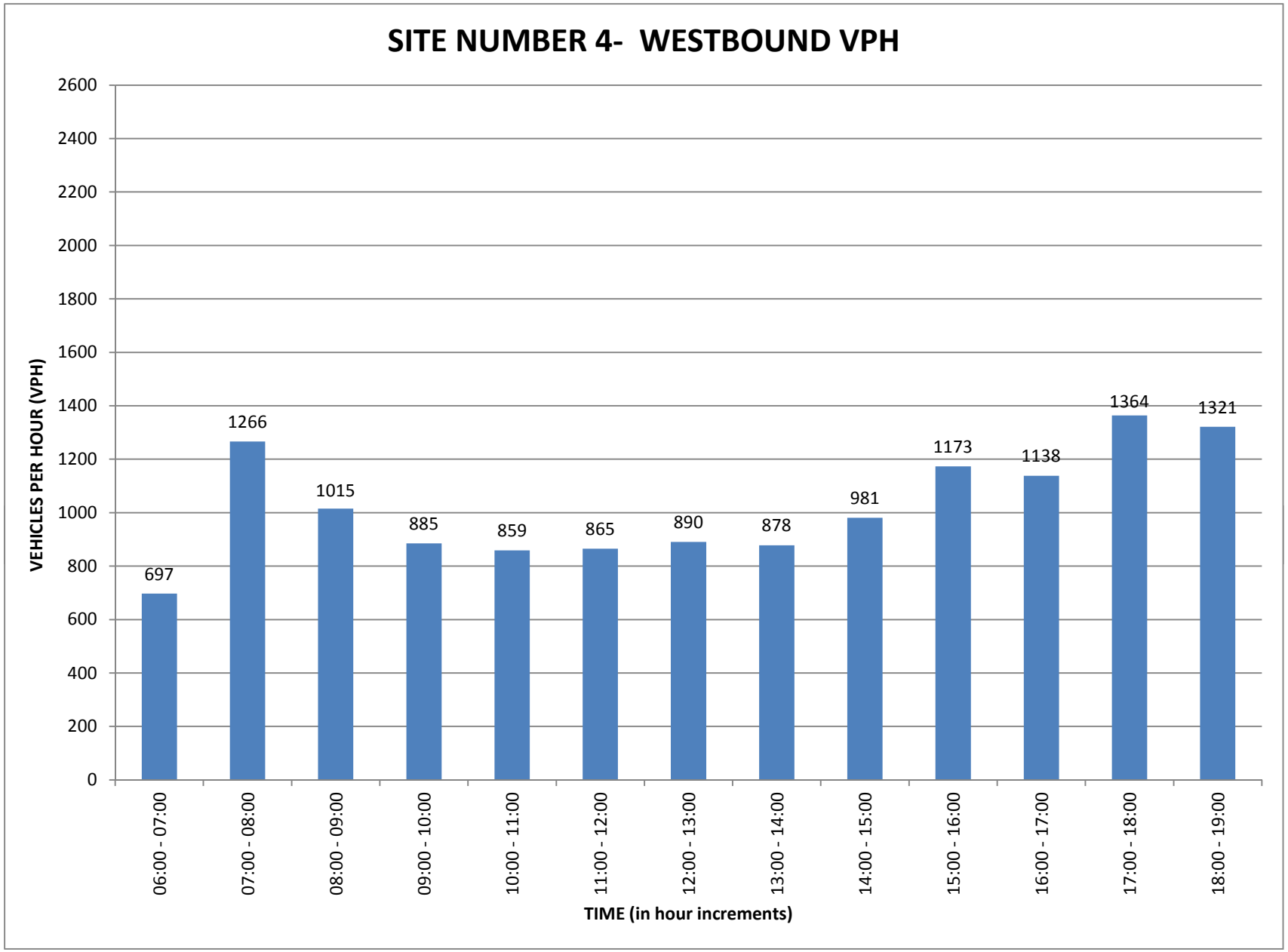

SITE NUMBER 1- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
460
560
474
412
339
390
365
331
395
393
363
678
544
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

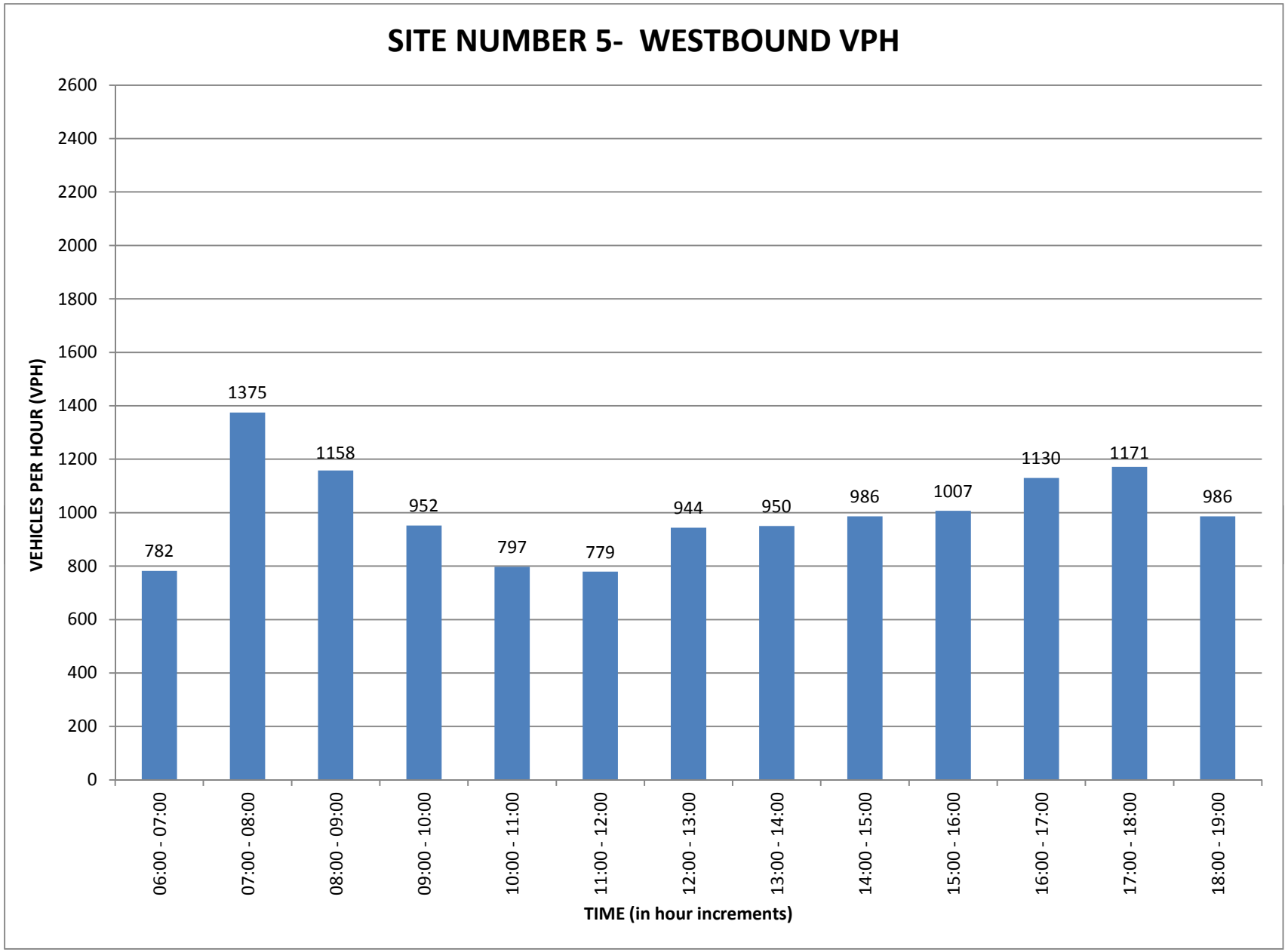

SITE NUMBER 2- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1077
956
779
621
498
530
471
449
217
464
516
629
539
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

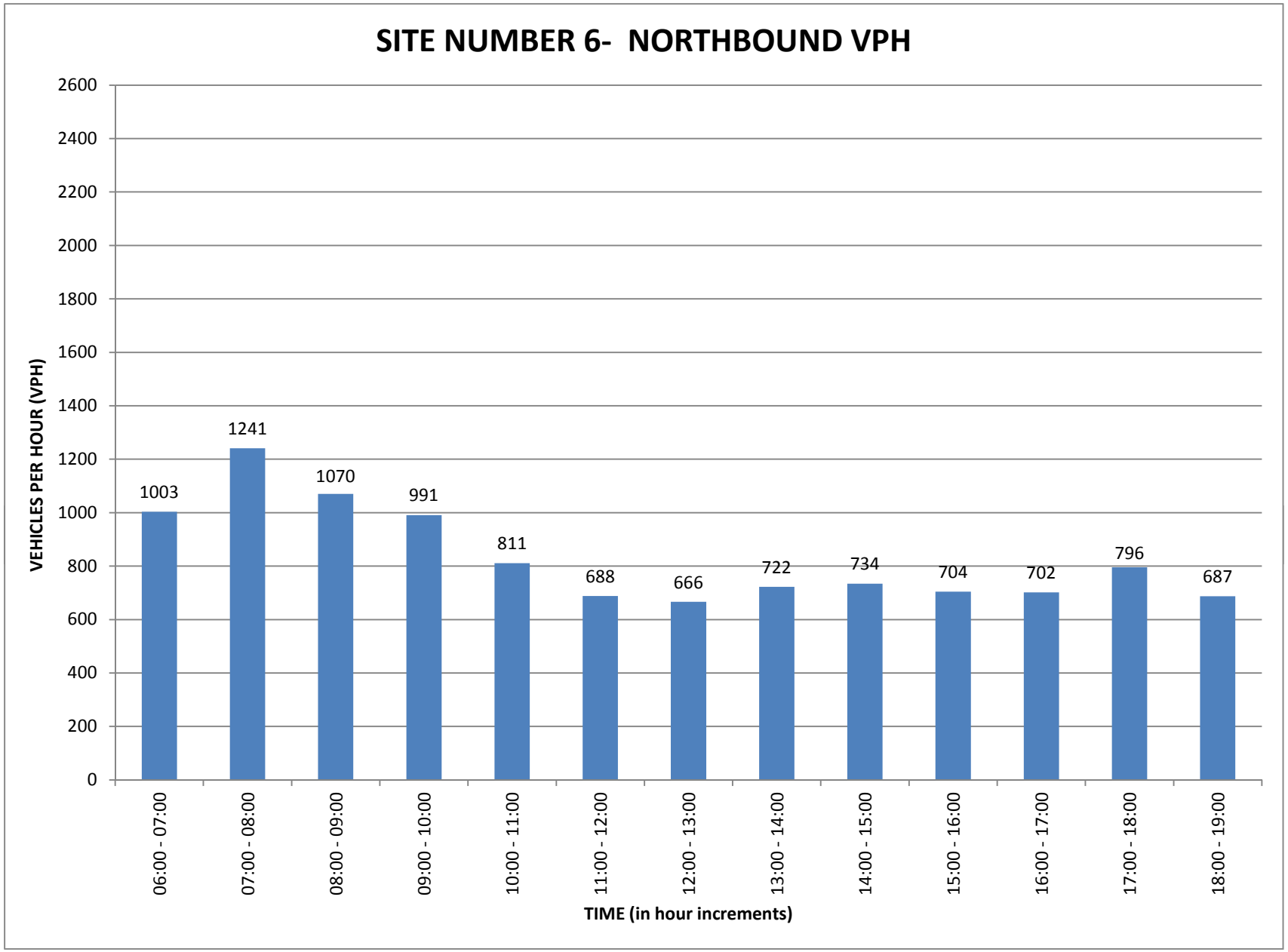
SITE NUMBER 2A- NORTHBOUND VPH

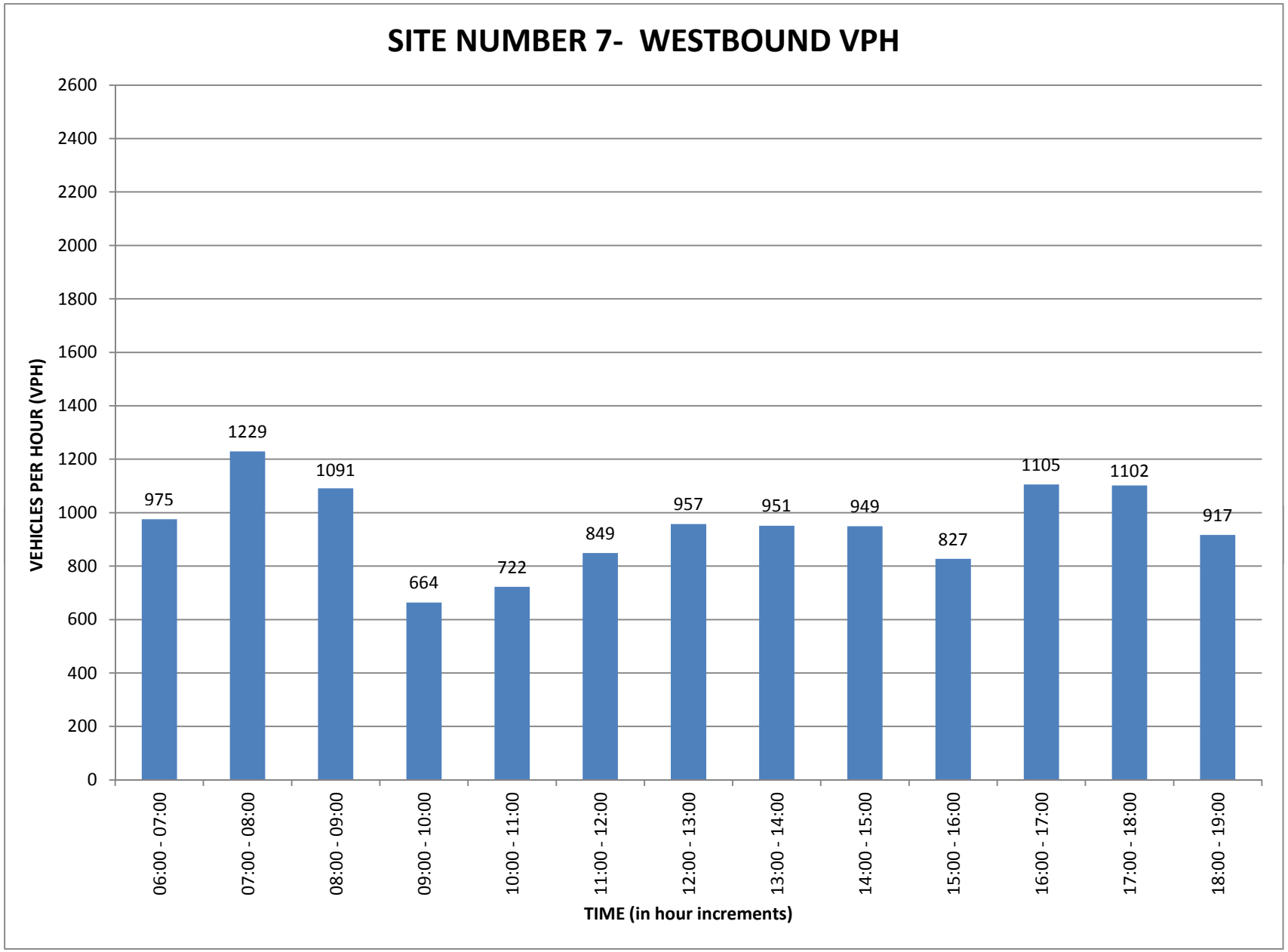


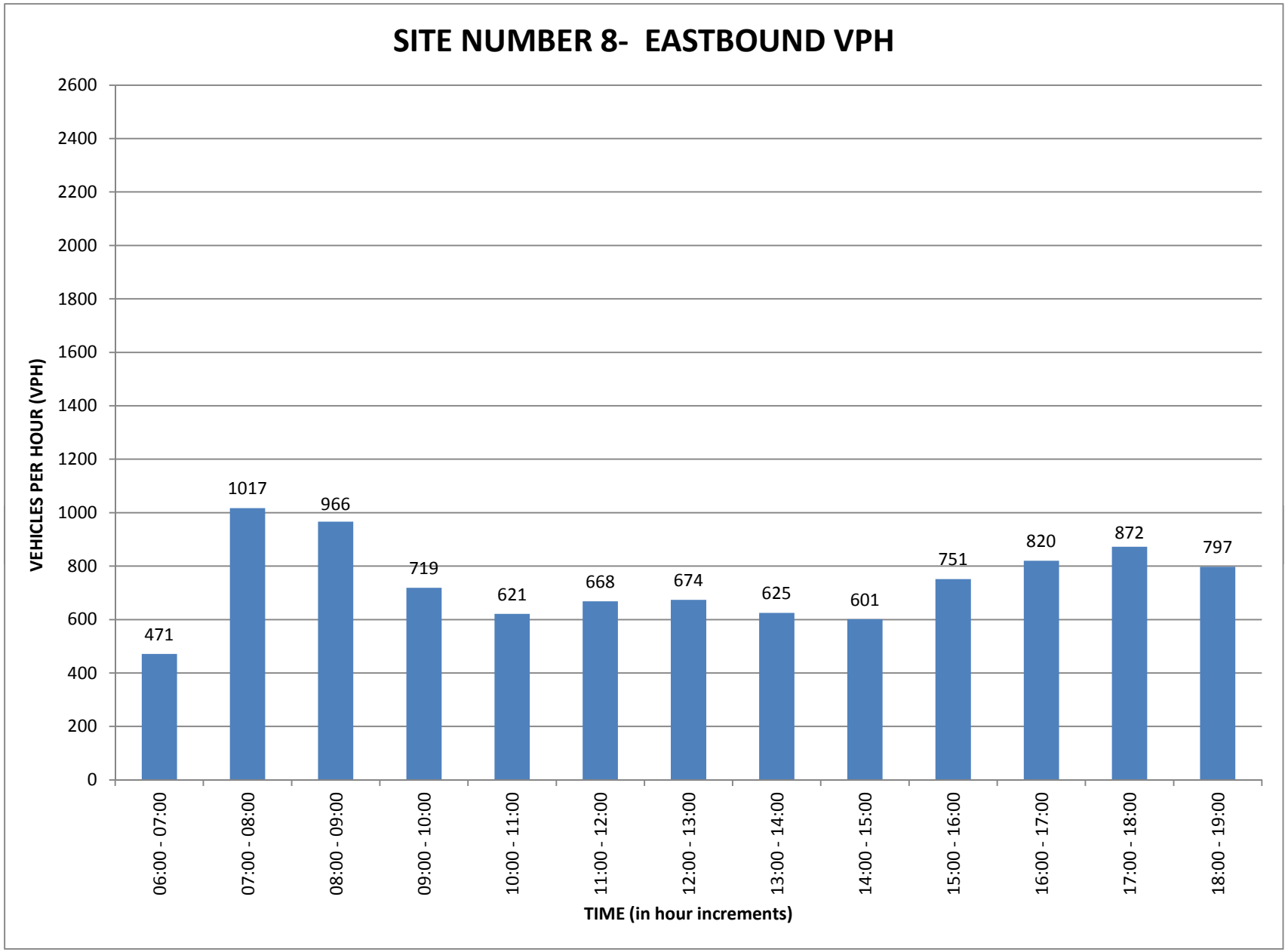

SITE NUMBER 3- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1098
1197
697
504
701
624
601
729
686
752
869
680
685
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

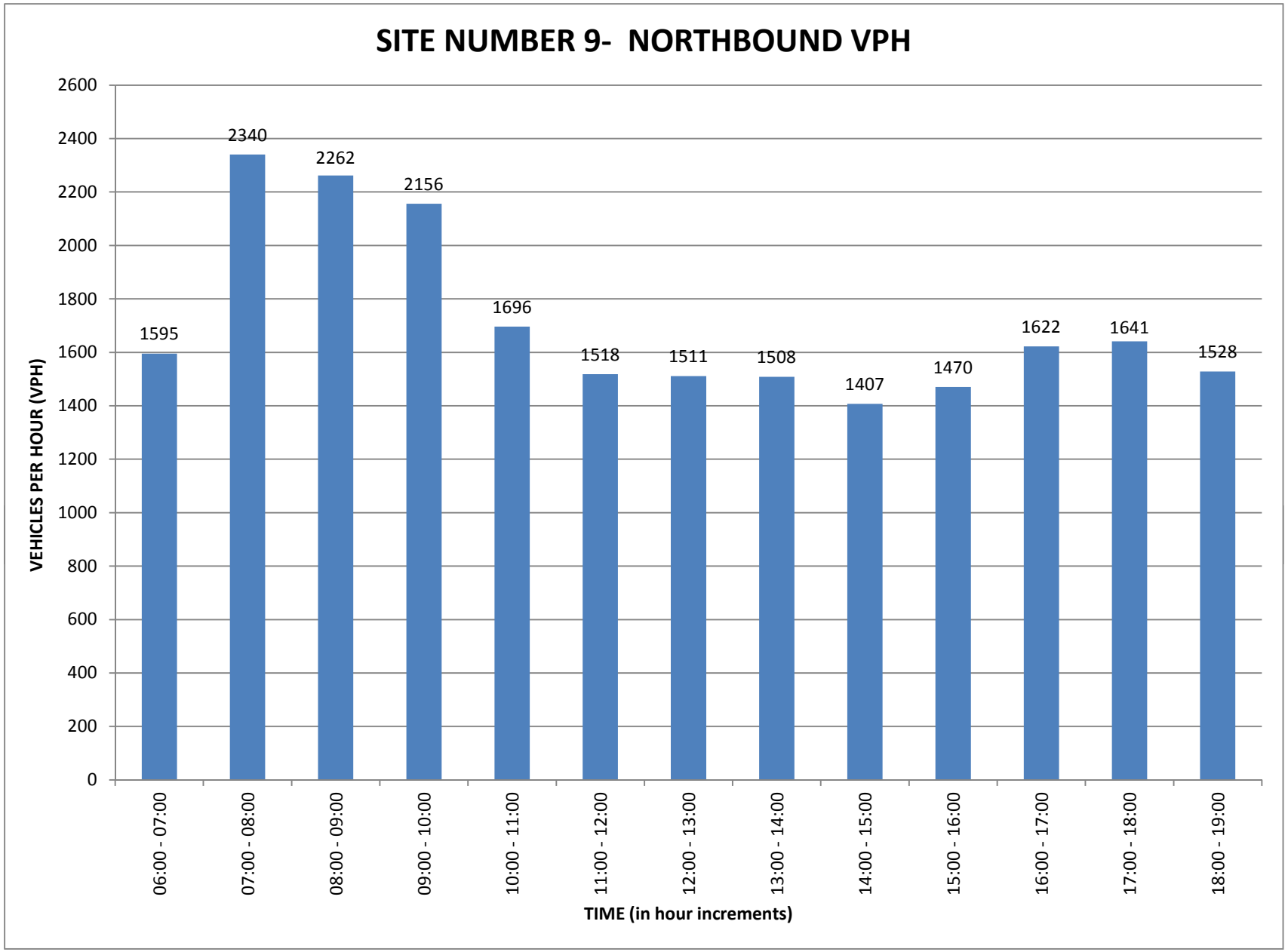

SITE NUMBER 4- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
697
1266
1015
885
859
865
890
878
981
1173
1138
1364
1321
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

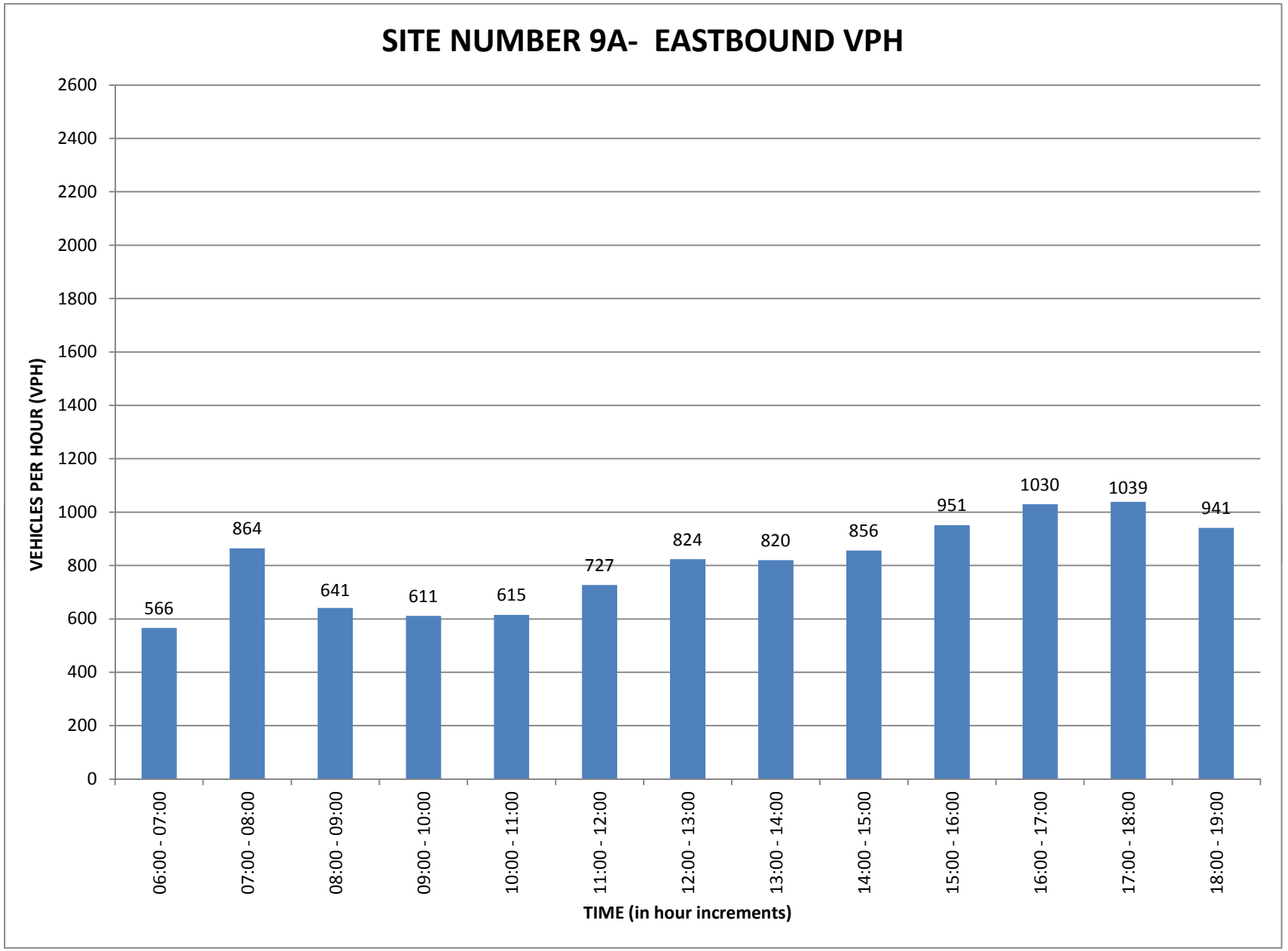

SITE NUMBER 5- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
782
1375
1158
952
797
779
944
950
986
1007
1130
1171
986
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

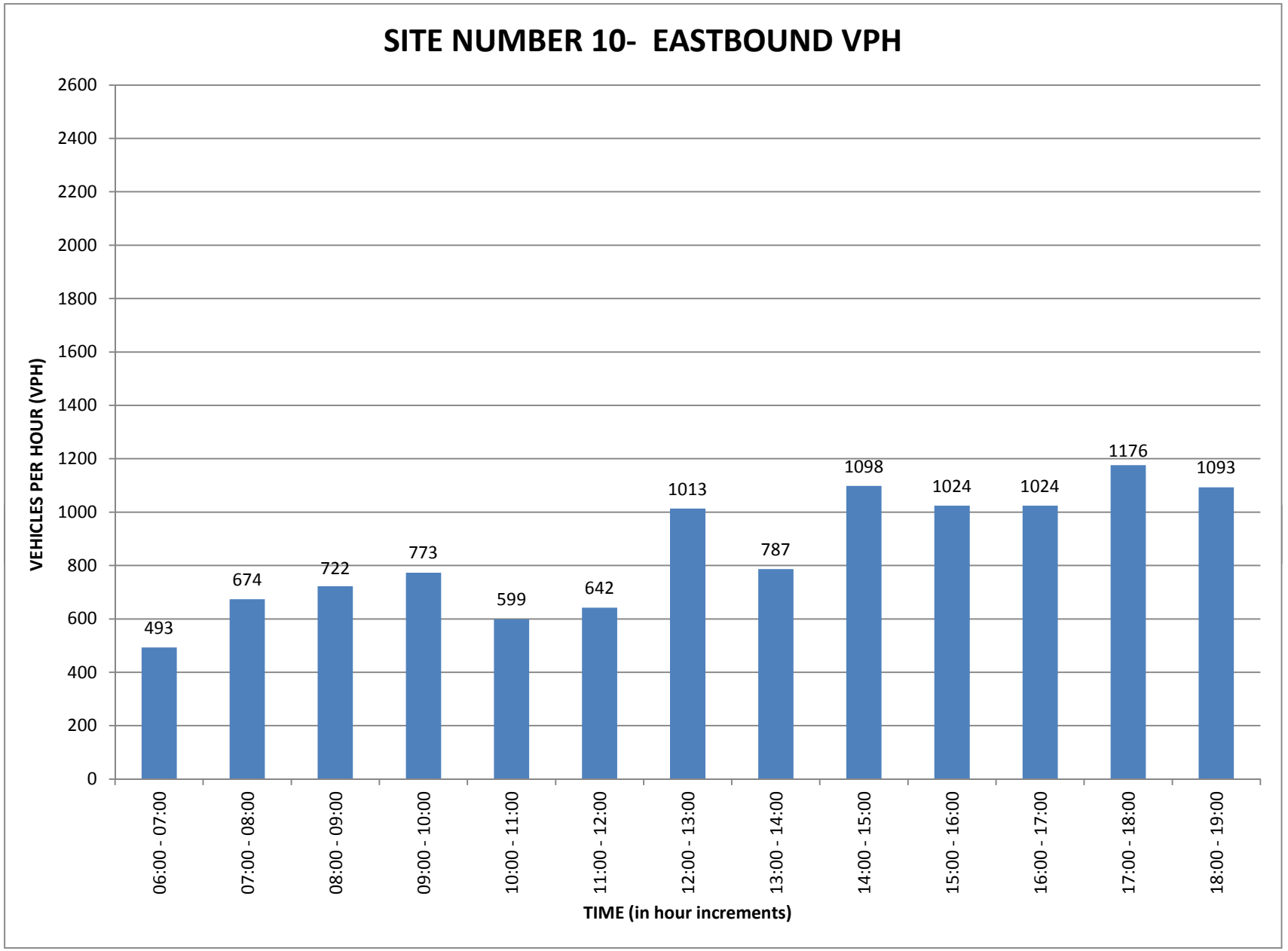

SITE NUMBER 6- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1003
1241
1070
991
811
688
666
722
734
704
702
796
687
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

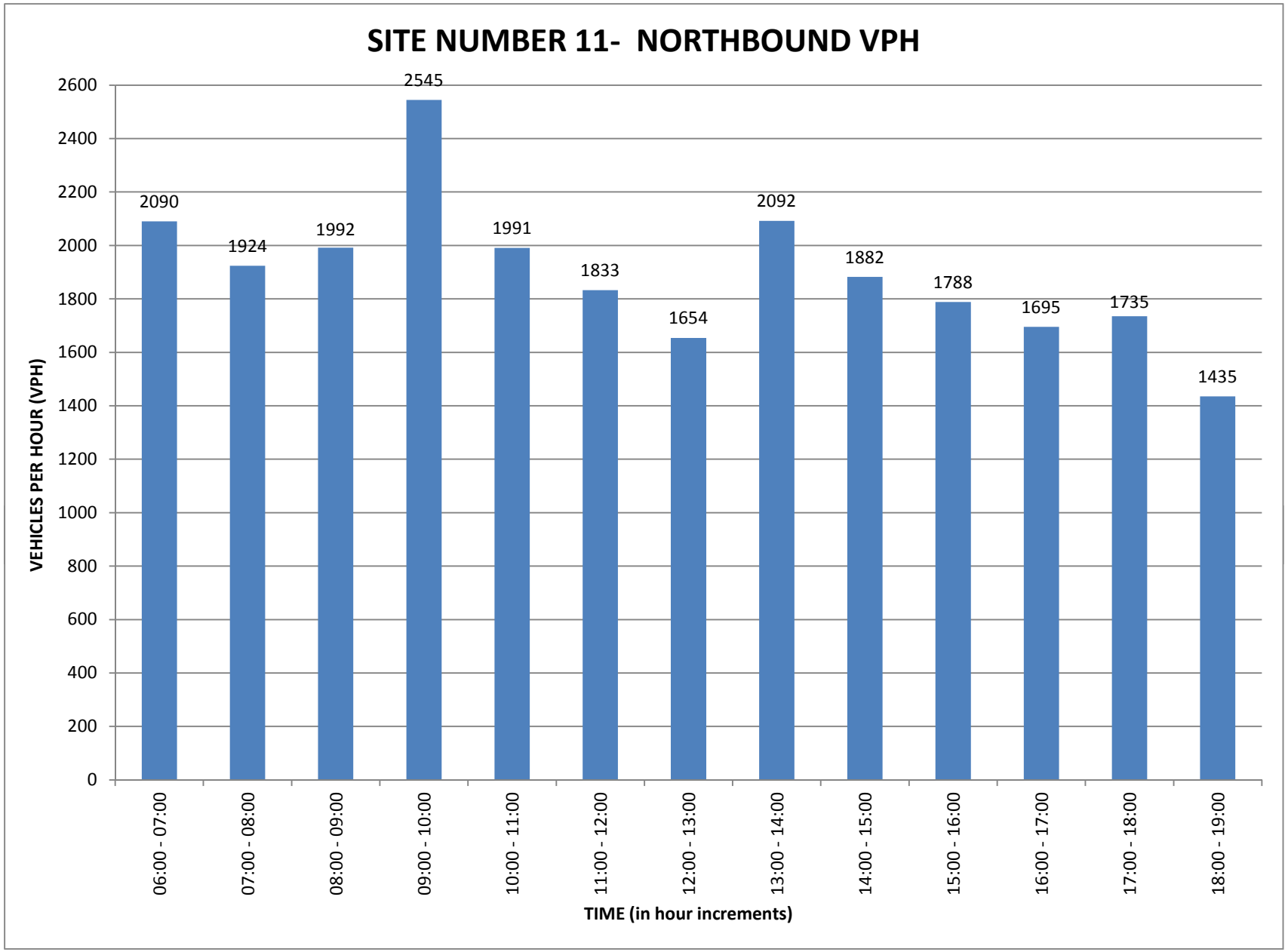

SITE NUMBER 7- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
975
1229
1091
664
722
849
957
951
949
827
1105
1102
917
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

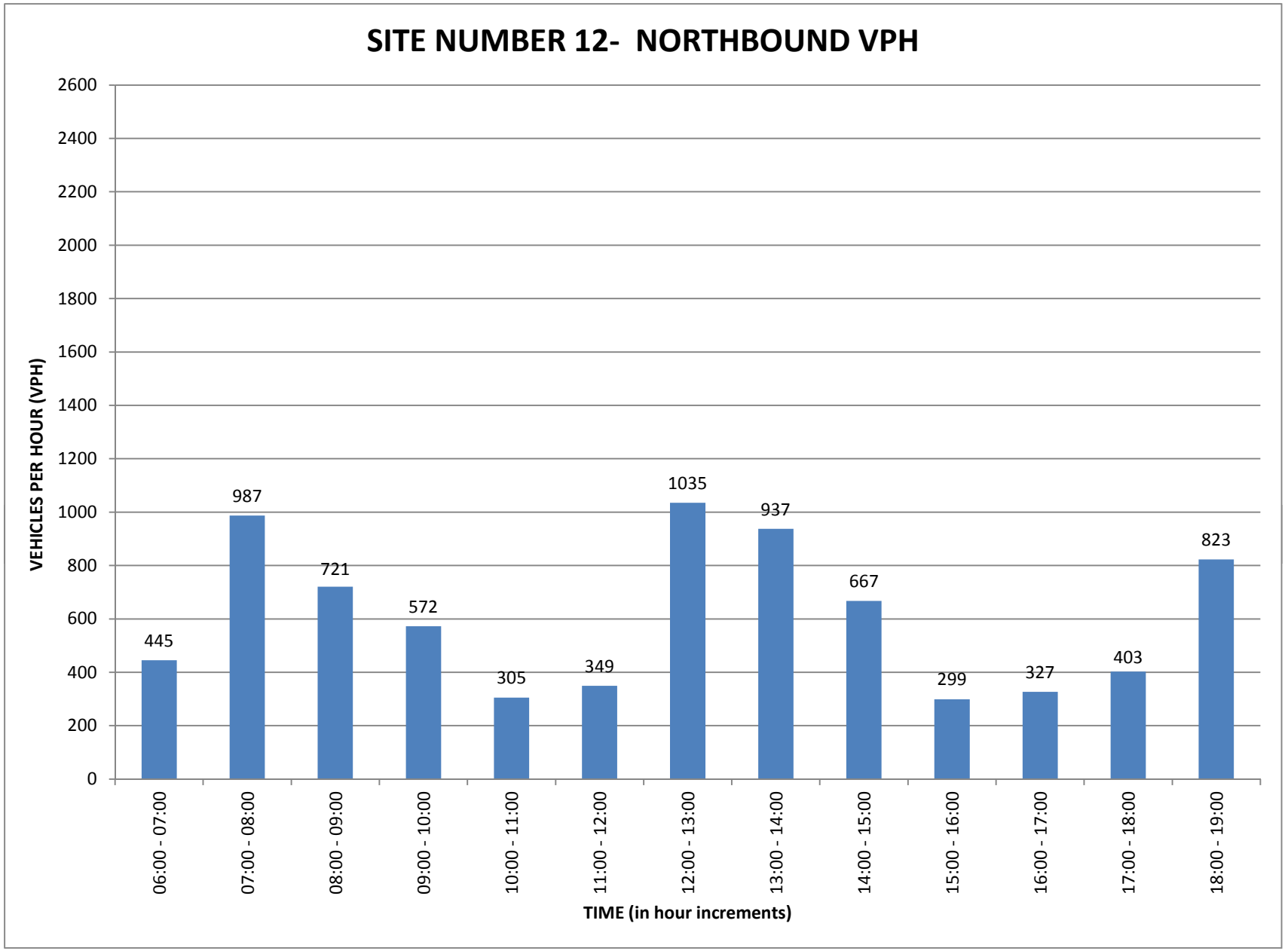

SITE NUMBER 8- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
471
1017
966
719
621
668
674
625
601
751
820
872
797
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

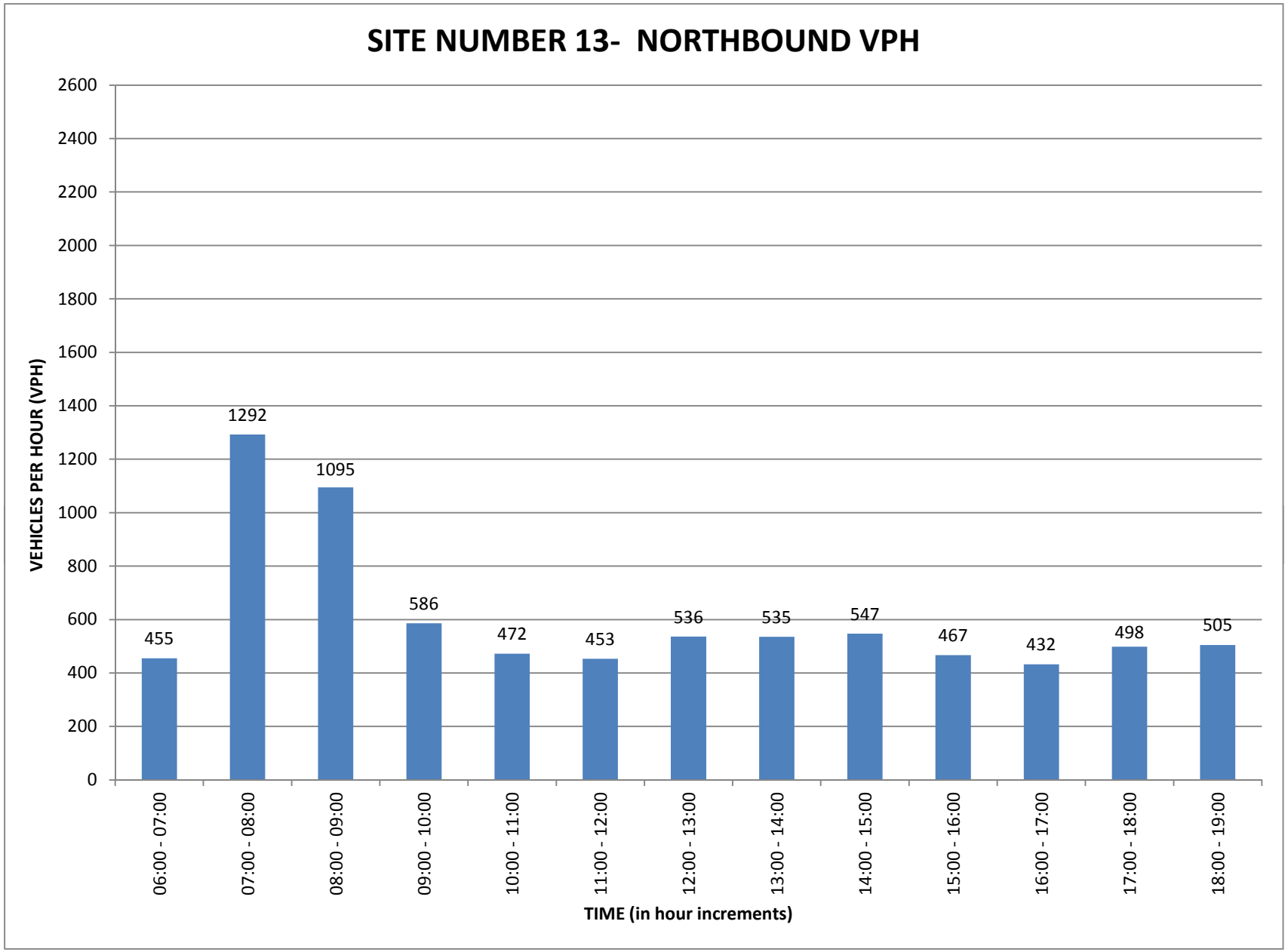

SITE NUMBER 9- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1595
2340
2262
2156
1696
1518
1511
1508
1407
1470
1622
1641
1528
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

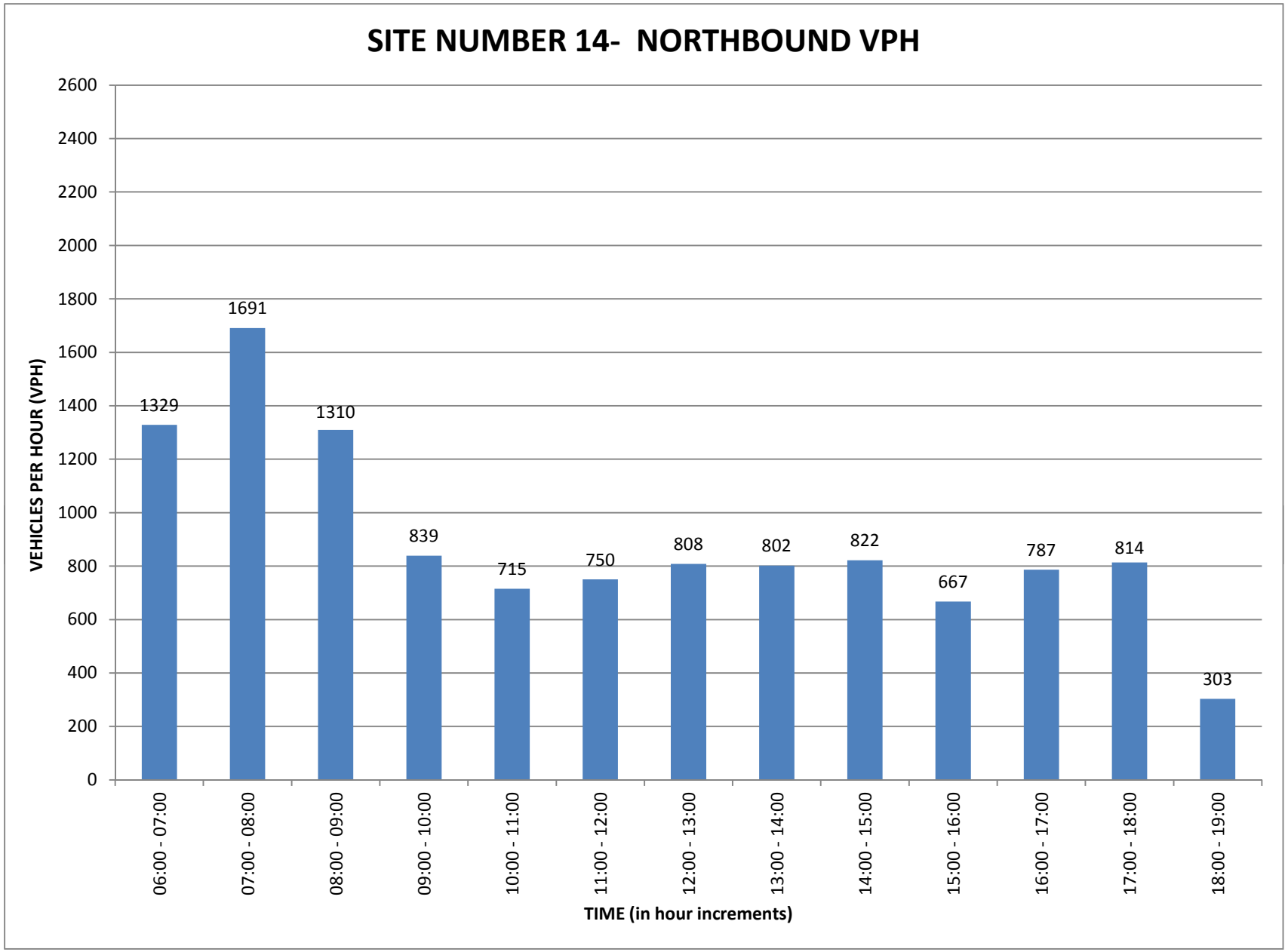

SITE NUMBER 9A- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
566
864
641
611
615
727
824
820
856
951
1030
1039
941
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 10- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
493
674
722
773
599
642
1013
787
1098
1024
1024
1176
1093
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 11- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2090
1924
1992
2545
1991
1833
1654
2092
1882
1788
1695
1735
1435
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 12- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
445
987
721
572
305
349
1035
937
667
299
327
403
823
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 13- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
455
1292
1095
586
472
453
536
535
547
467
432
498
505
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 14- NORTHBOUND VPH
VEHICLES PER HOUR (VPH)
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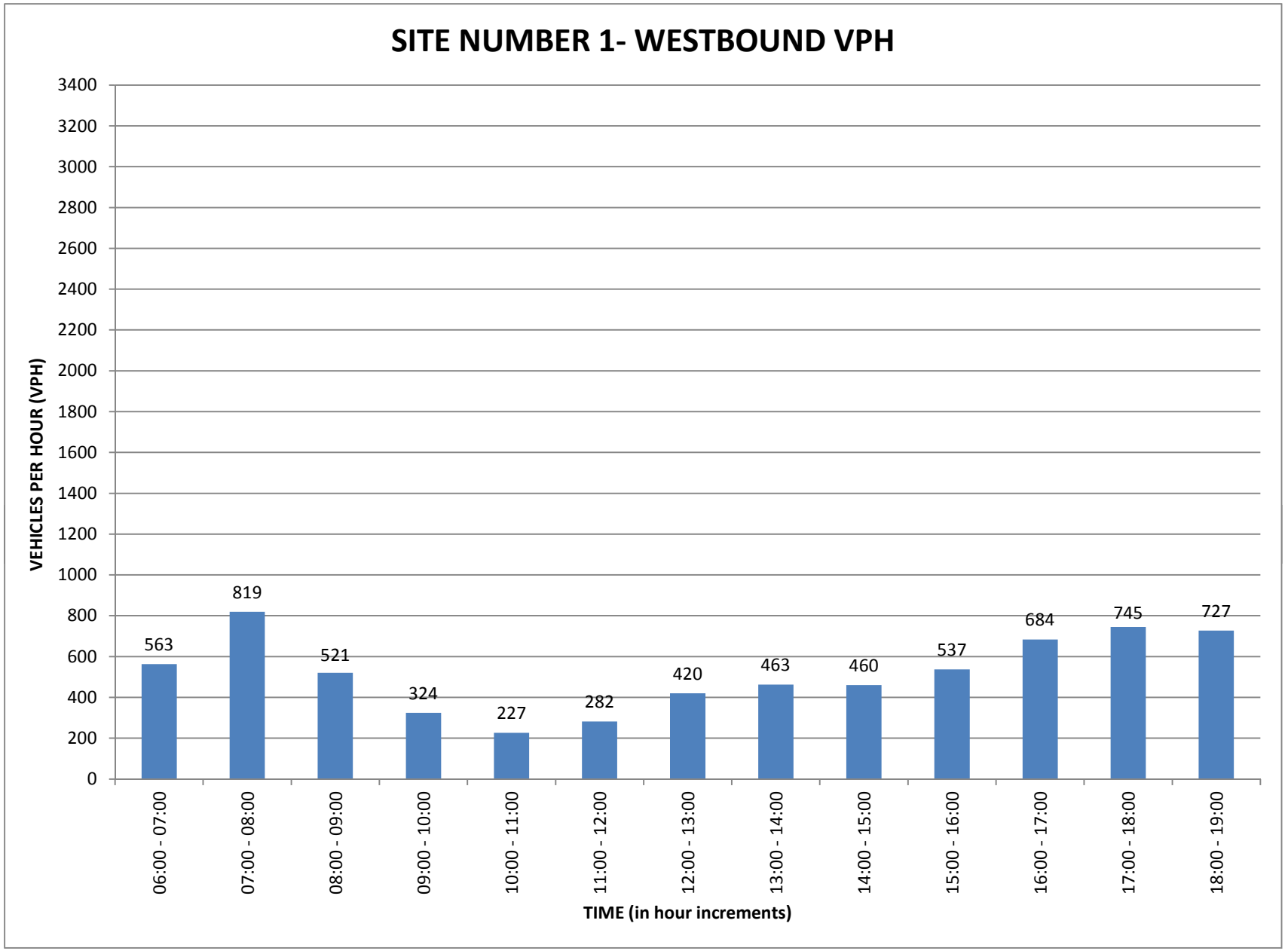
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1329
1691
1310
839
715
750
808
802
822
667
787
814
303
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						
				6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13
1	FM 1626 between S. 1st Street and Old San Antonio Road	W	10-3	563	819	521	324	227	282	420
2	FM 1626 between Brodie Ln and Johnson Ln (south)	W	10-3	188	336	355	333	332	382	448
2A	Brodie Ln between Green Emerald and Twilight	S	10-3	86	342	322	235	283	357	400
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	S	10-3	426	470	480	457	535	522	578
4	Slaughter Ln just east of Manchaca Rd/FM 2304	E	10-3	738	1129	1103	922	869	1093	1060
5	Slaughter Ln just east of Brodie Ln	E	10-3	405	787	883	671	666	830	936
6	Brodie Ln just south of Slaughter Ln	S	10-3	925	819	479	378	479	620	705
7	Slaughter Ln just east of Loop 1 (MoPac)	E	10-3	266	683	786	572	686	786	962
8	Slaughter Ln just west of Loop 1 (MoPac)	W	10-3	192	508	652	560	601	660	696
9	Loop 1 (MoPac) just south of William Cannon	S	10-3	431	785	995	1050	1131	1565	1711
9A	William Cannon just west of IH 34	W	10-3	516	921	901	844	831	1030	1059
10	William Cannon just west of Loop 1 (Mopac)	W	10-3	443	790	937	930	915	1143	1250
11	Loop 1 (MoPac) just north of William Cannon	S	10-3	427	852	1059	1018	1106	1659	1620
12	Brodie Ln between US 290/71/Ben White & William Cannon	S	10-3	100	257	356	451	605	841	1042
13	Westgate between Jones Rd and West Stasney Ln	S	10-3	88	231	248	264	243	399	486
14	Manchaca Rd just north of Jones Rd	S	10-3	151	447	559	430	565	704	901

Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						13 HR TOTAL
				13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	
1	FM 1626 between S. 1st Street and Old San Antonio Road	W	10-3	463	460	537	684	745	727	**6,772**
2	FM 1626 between Brodie Ln and Johnson Ln (south)	W	10-3	517	569	689	876	1066	823	**6,914**
2A	Brodie Ln between Green Emerald and Twilight	S	10-3	451	647	580	799	851	789	**6,142**
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	S	10-3	633	774	806	1055	1269	1137	**9,142**
4	Slaughter Ln just east of Manchaca Rd/FM 2304	E	10-3	1072	1179	1244	1594	1476	1475	**14,954**
5	Slaughter Ln just east of Brodie Ln	E	10-3	974	1022	1249	1585	1697	1396	**13,101**
6	Brodie Ln just south of Slaughter Ln	S	10-3	824	872	1032	1258	1254	1350	**10,995**
7	Slaughter Ln just east of Loop 1 (MoPac)	E	10-3	864	1020	1237	1371	1602	1489	**12,324**
8	Slaughter Ln just west of Loop 1 (MoPac)	W	10-3	762	863	943	1123	1095	875	**9,530**
9	Loop 1 (MoPac) just south of William Cannon	S	10-3	2011	2328	2546	3293	3378	2757	**23,981**
9A	William Cannon just west of IH 34	W	10-3	1112	1039	1275	1303	1293	1218	**13,342**
10	William Cannon just west of Loop 1 (Mopac)	W	10-3	997	1098	1250	1267	1517	1409	**13,946**
11	Loop 1 (MoPac) just north of William Cannon	S	10-3	1750	2095	2108	2451	2088	2501	**20,734**
12	Brodie Ln between US 290/71/Ben White & William Cannon	S	10-3	1092	2009	1117	1360	1553	1273	**12,056**
13	Westgate between Jones Rd and West Stasney Ln	S	10-3	486	563	668	1089	1367	965	**7,097**
14	Manchaca Rd just north of Jones Rd	S	10-3	583	850	1163	1246	1305	1102	**10,006**


SITE NUMBER 1- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
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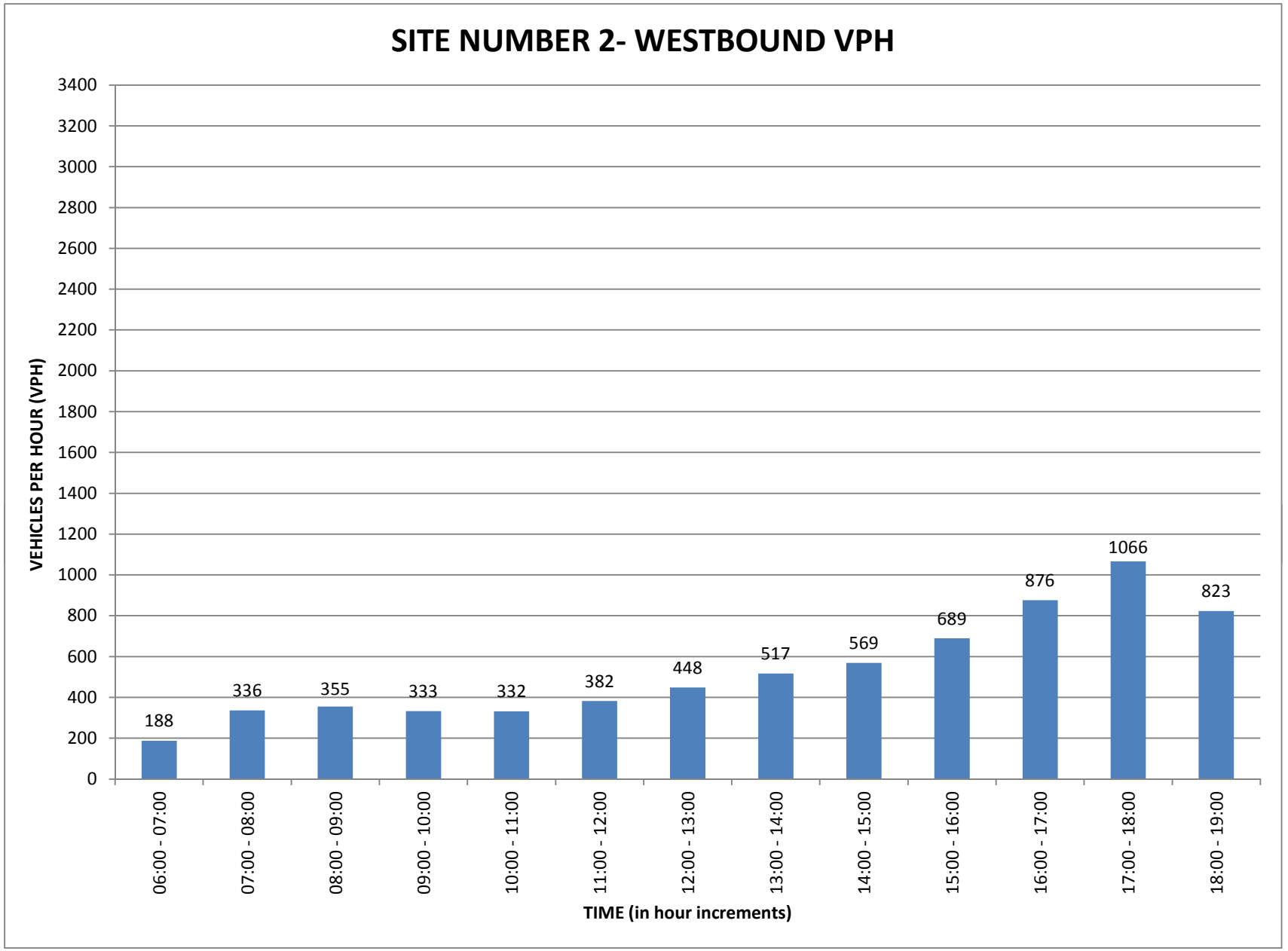
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
563
819
521
324
227
282
420
463
460
537
684
745
727
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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VEHICLES PER HOUR (VPH)
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2400
2200
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1800
1600
1400
1200
1000
800
600
400
200
0
188
336
355
333
332
382
448
517
569
689
876
1066
823
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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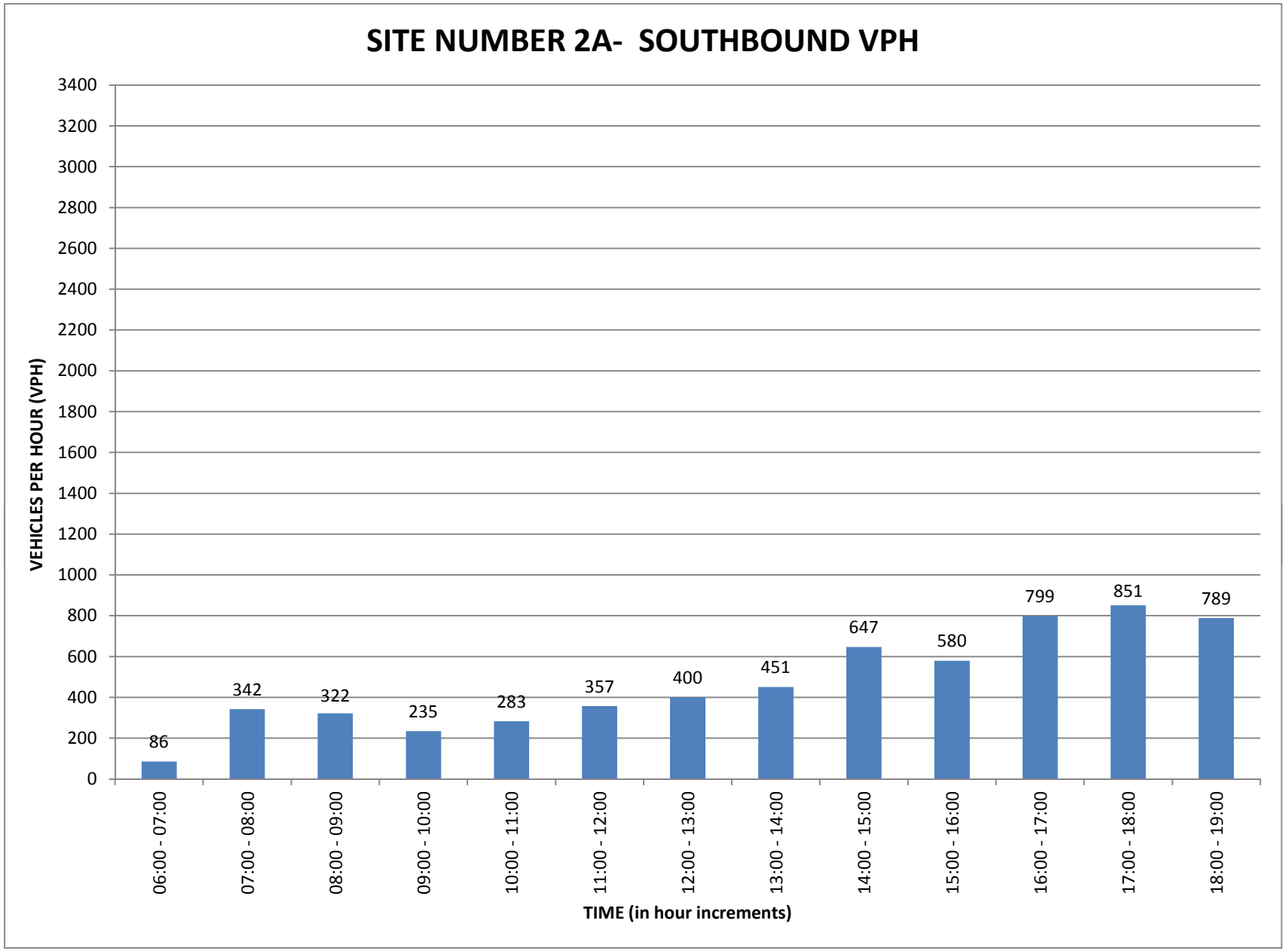
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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VEHICLES PER HOUR (VPH)
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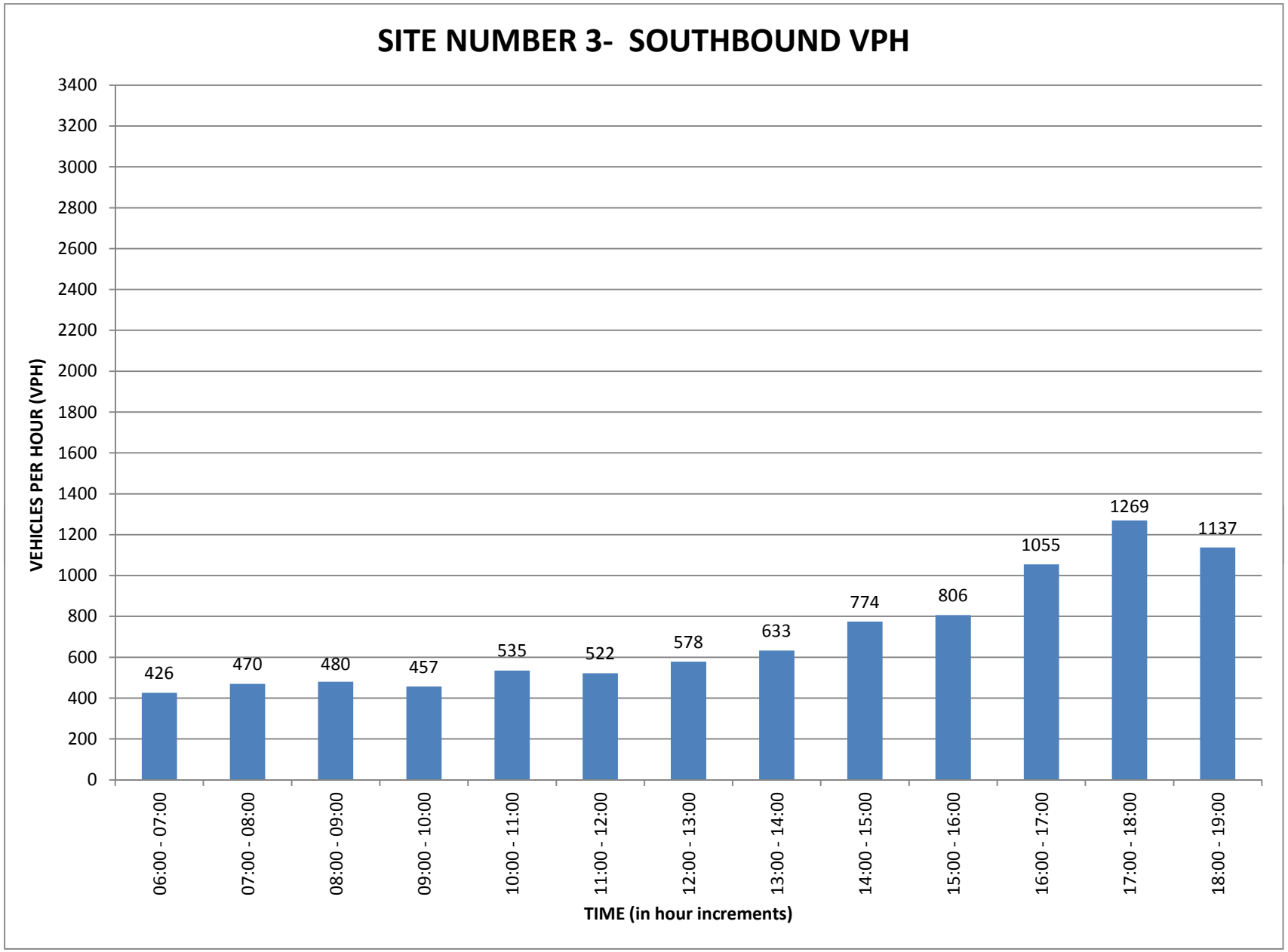
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
86
342
322
235
283
357
400
451
647
580
799
851
789
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 3- SOUTHBOUND VPH
VEHICLES PER HOUR (VPH)
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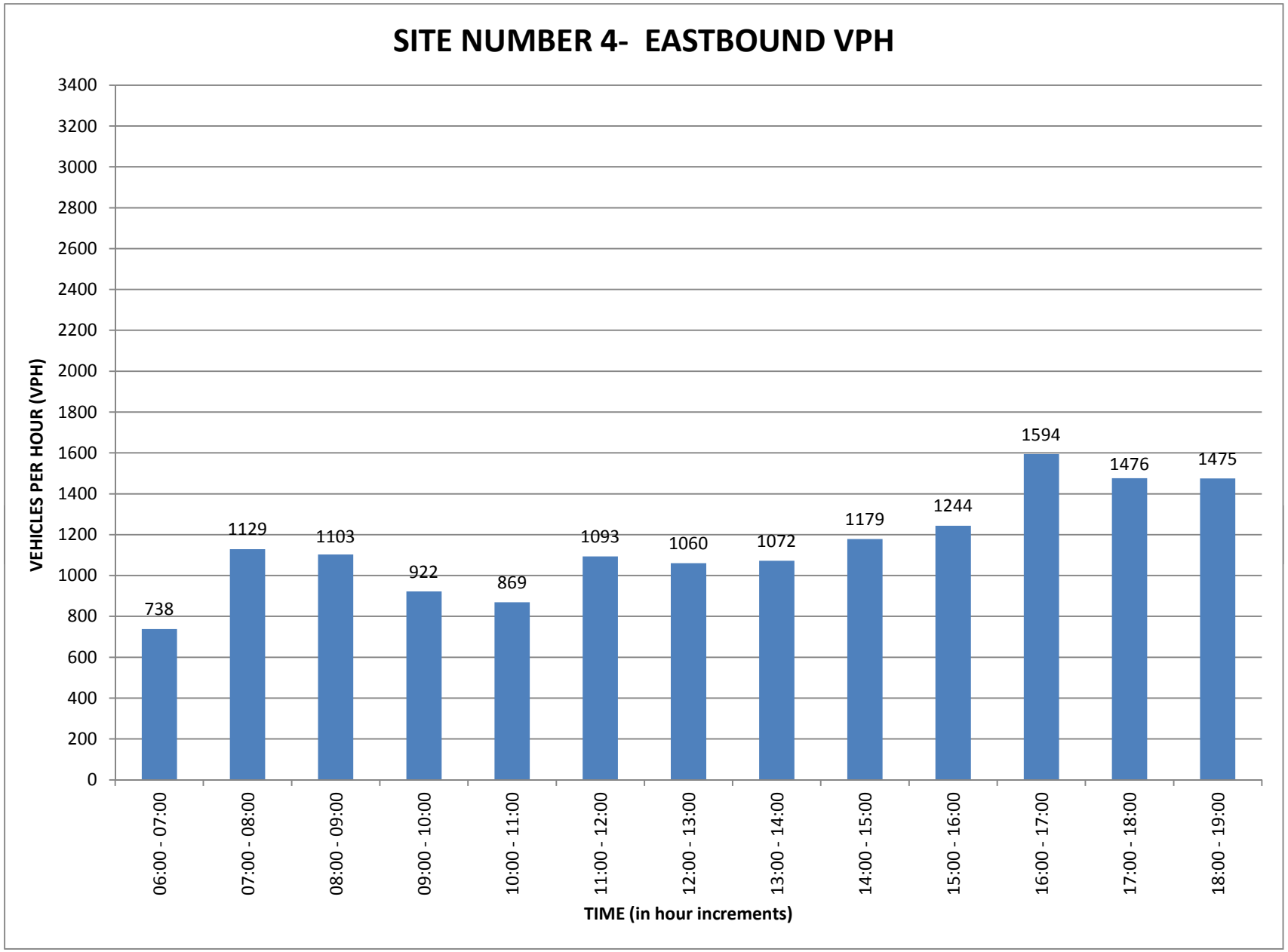
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
426
470
480
457
535
522
578
633
774
806
1055
1269
1137
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 4- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
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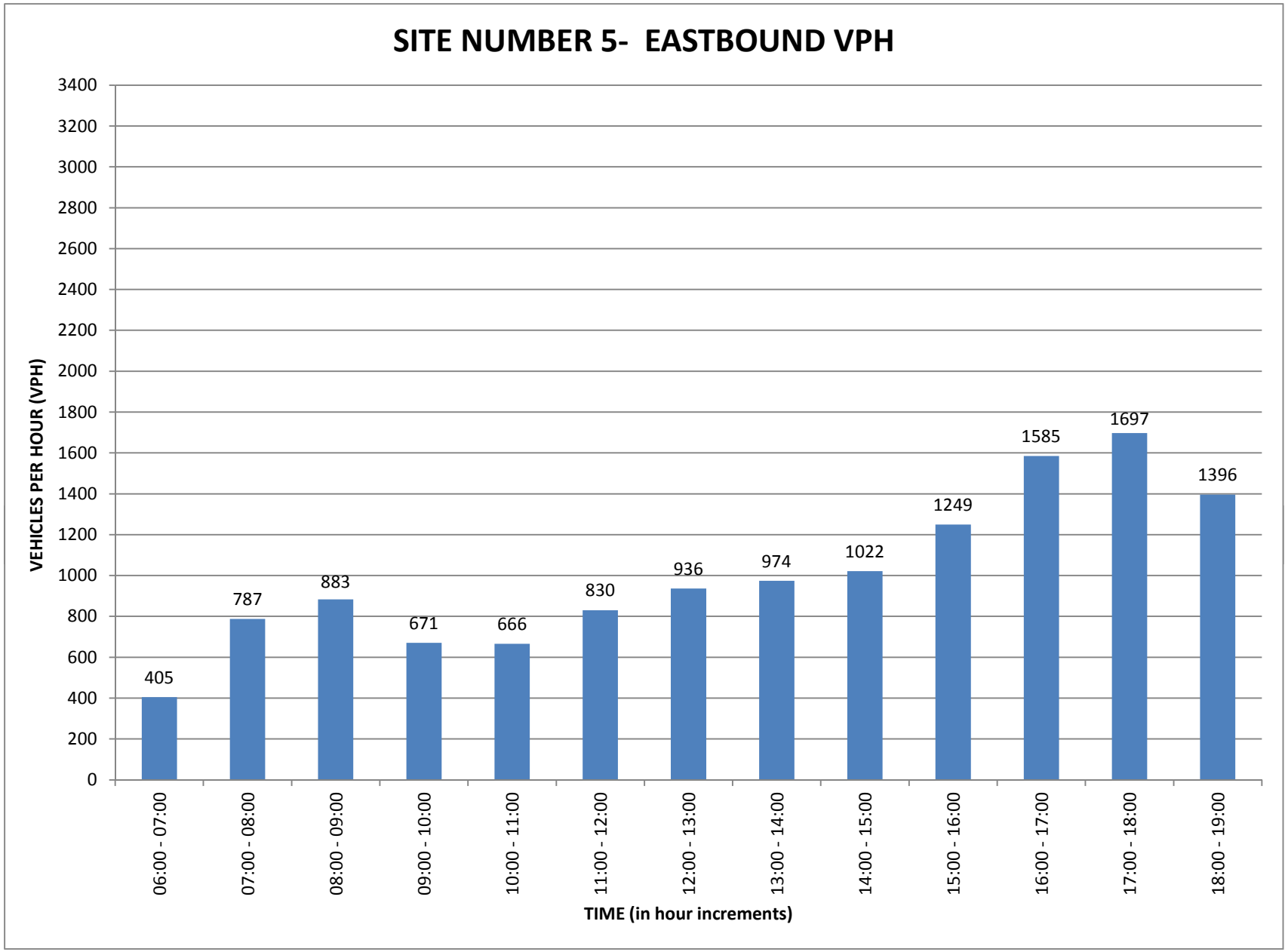
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
738
1129
1103
922
869
1093
1060
1072
1179
1244
1594
1476
1475
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 5- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
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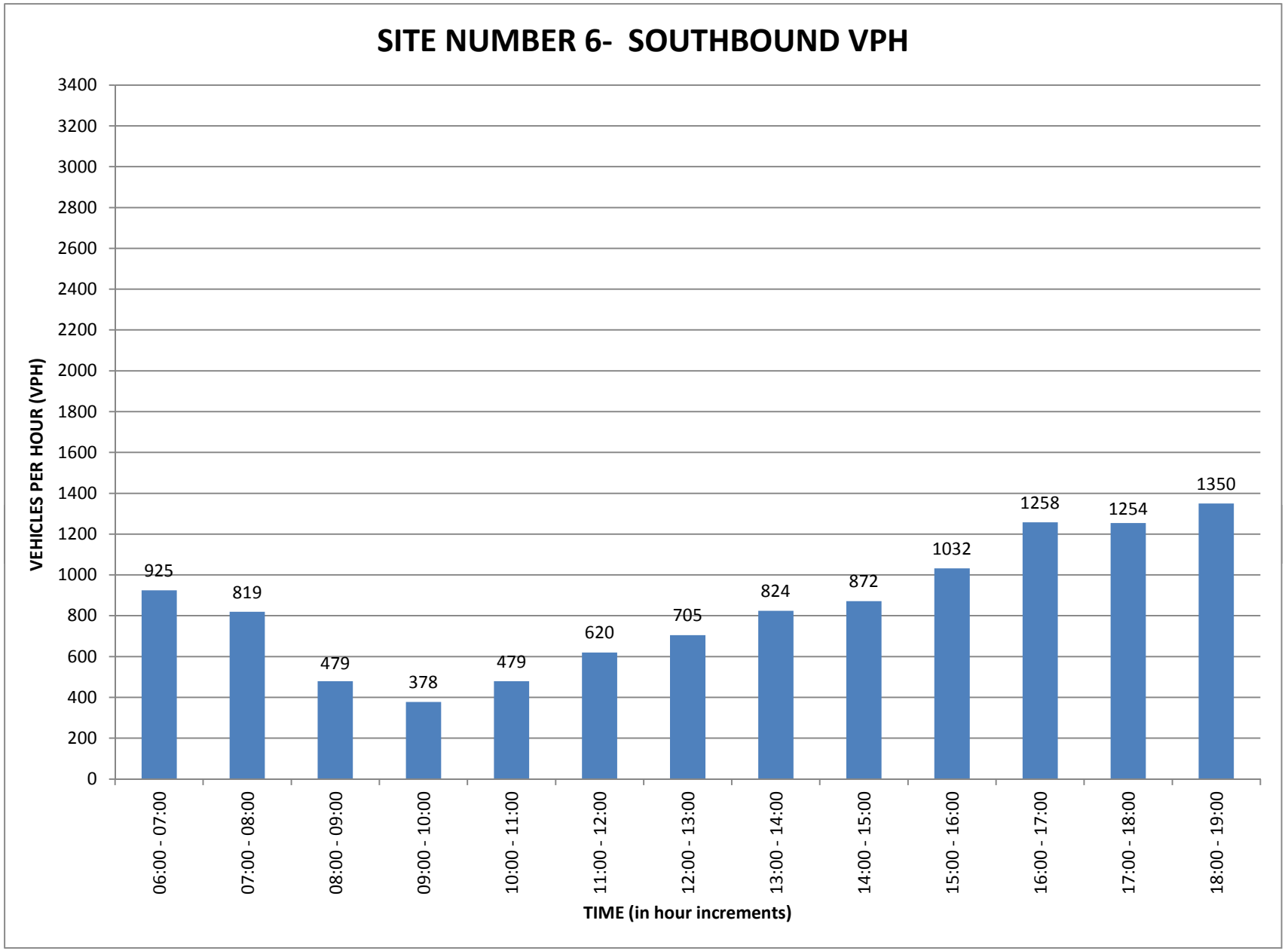
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
405
787
883
671
666
830
936
974
1022
1249
1585
1697
1396
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 6- SOUTHBOUND VPH
VEHICLES PER HOUR (VPH)
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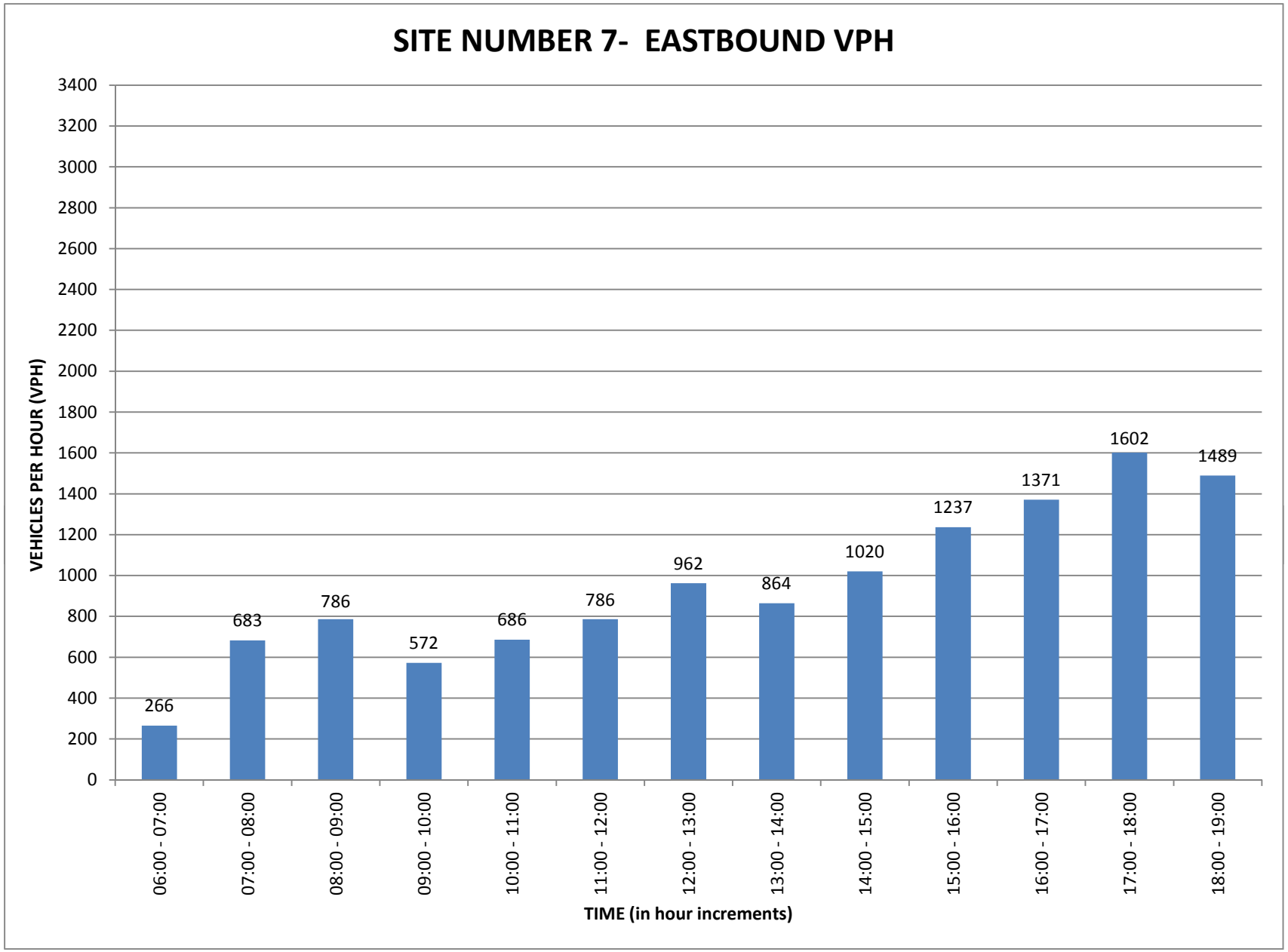
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
925
819
479
378
479
620
705
824
872
1032
1258
1254
1350
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 7- EASTBOUND VPH
VEHICLES PER HOUR (VPH)
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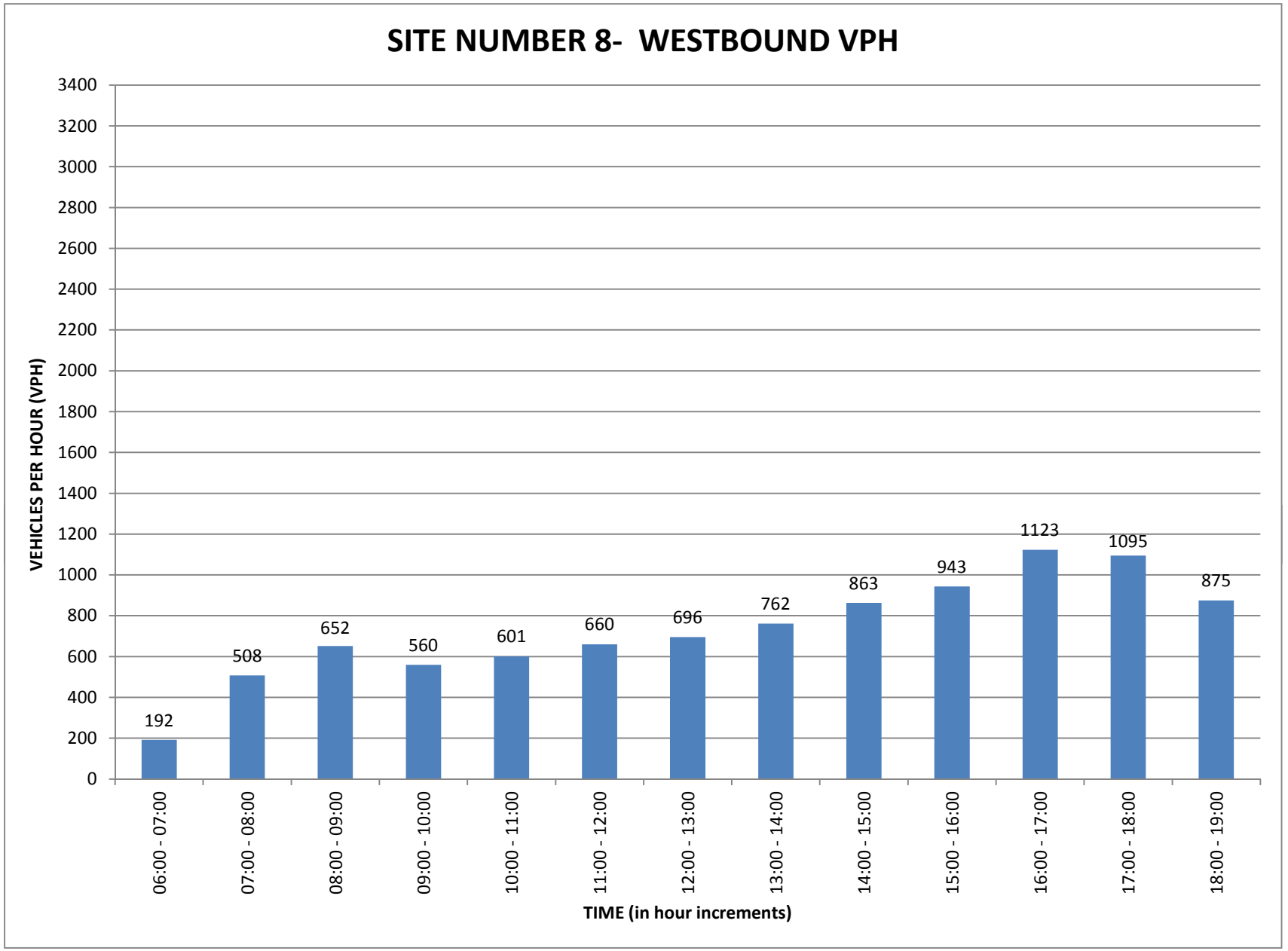
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
266
683
786
572
686
786
962
864
1020
1237
1371
1602
1489
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 8- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
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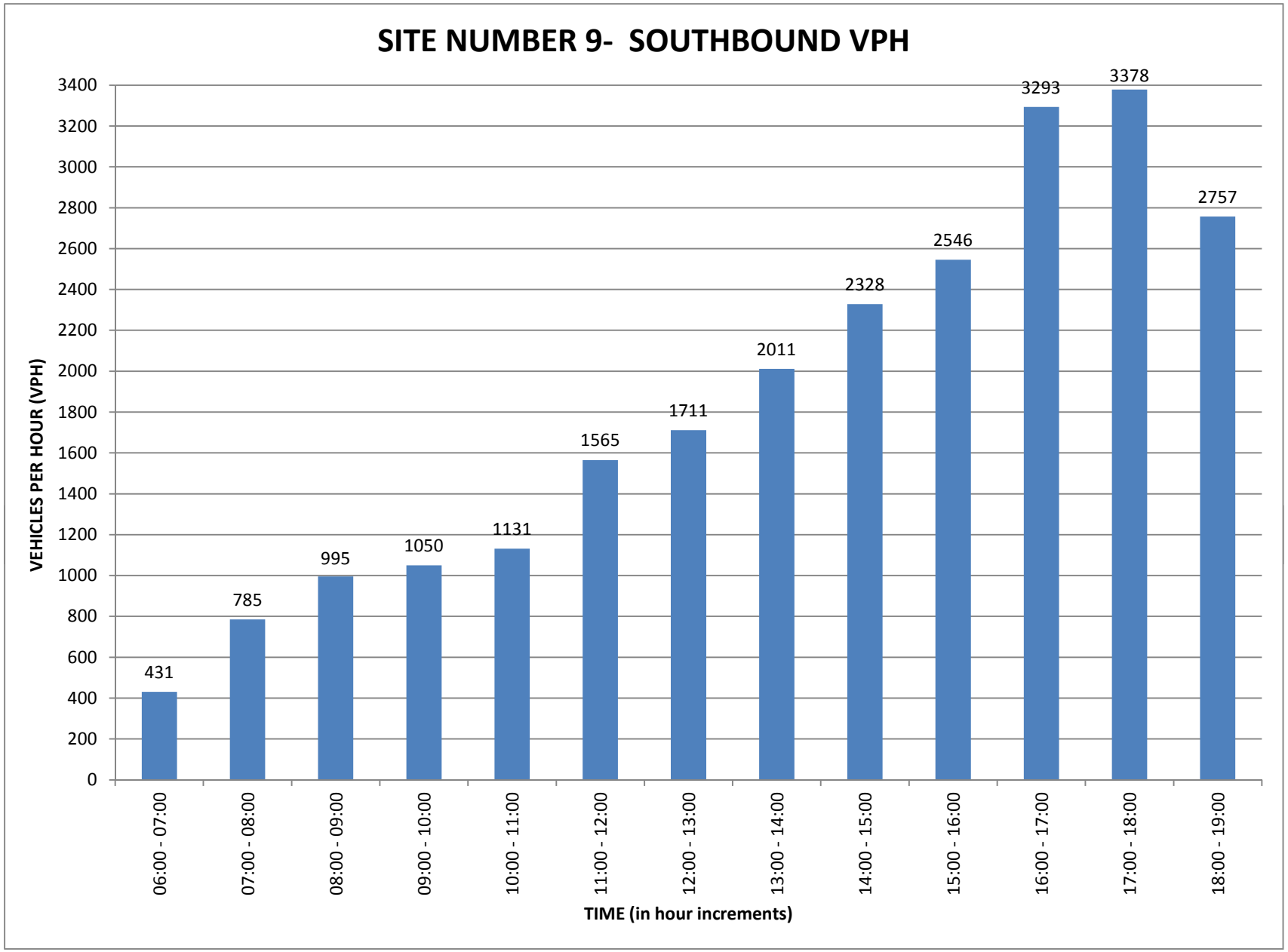
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
192
508
652
560
601
660
696
762
863
943
1123
1095
875
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 9- SOUTHBOUND VPH
VEHICLES PER HOUR (VPH)
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3000
2800
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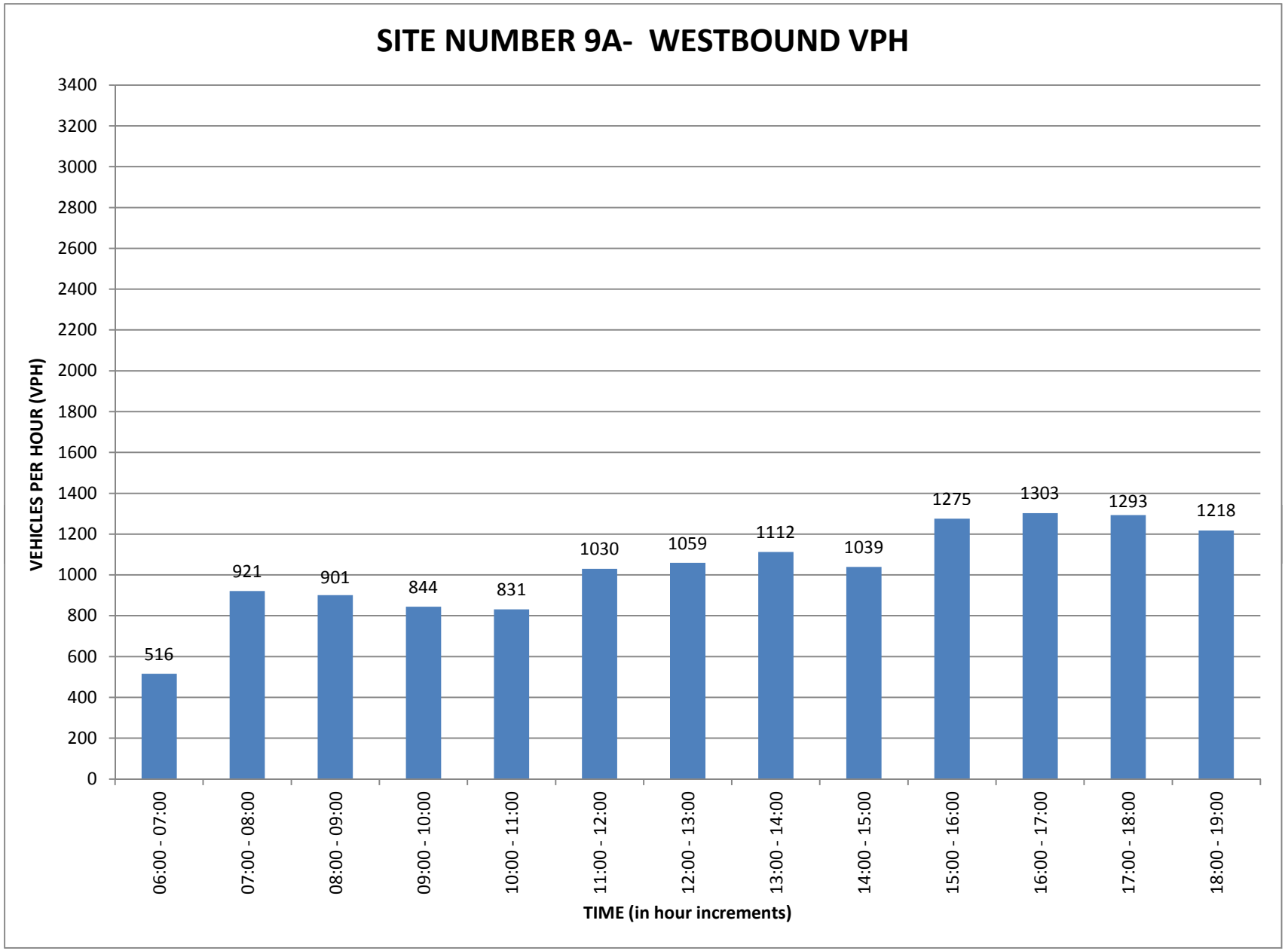
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
431
785
995
1050
1131
1565
1711
2011
2328
2546
3293
3378
2757
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 9A- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
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2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
516
921
901
844
831
1030
1059
1112
1039
1275
1303
1293
1218
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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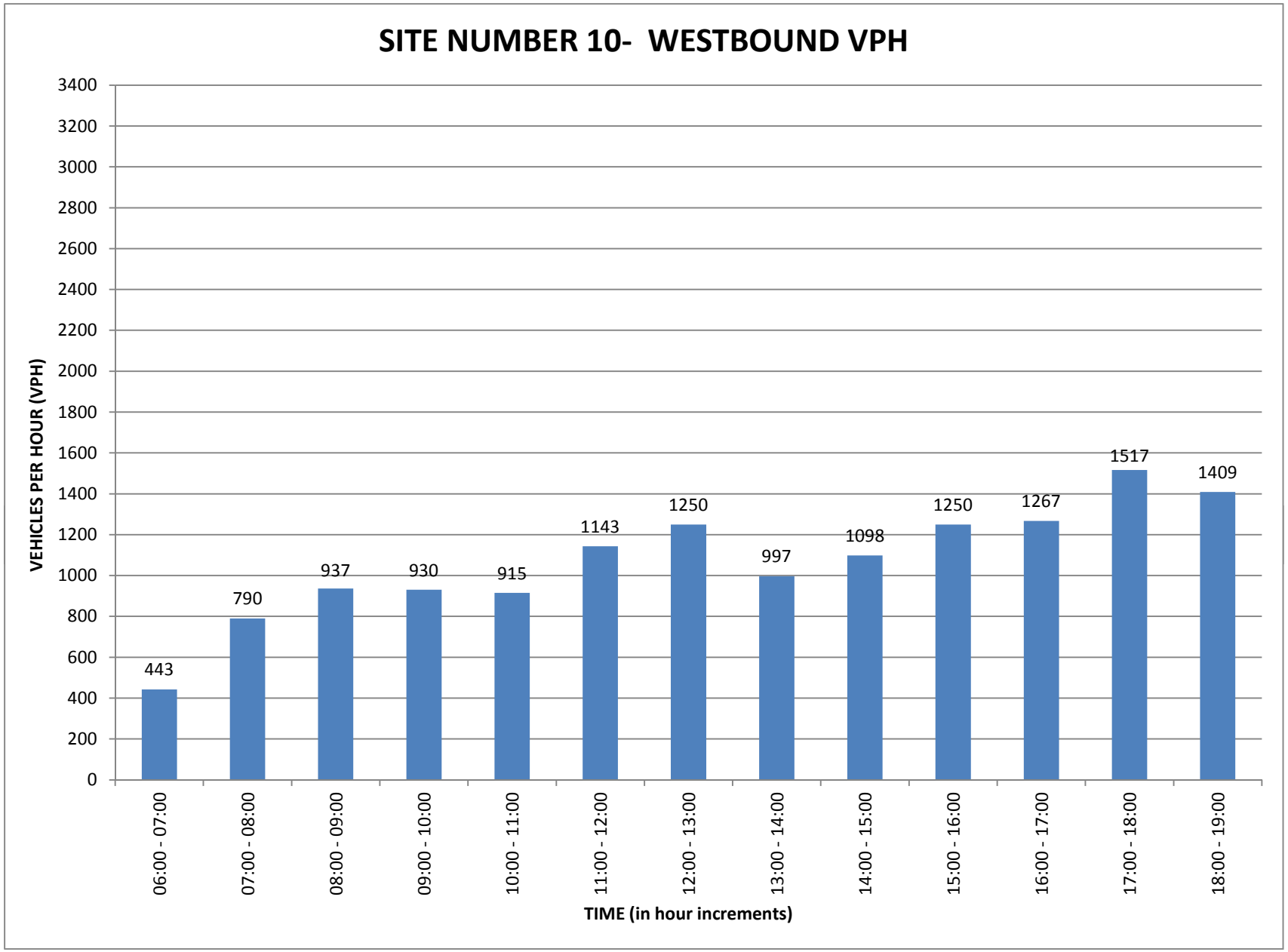
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 10- WESTBOUND VPH
VEHICLES PER HOUR (VPH)
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2800
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2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
443
790
937
930
915
1143
1250
997
1098
1250
1267
1517
1409
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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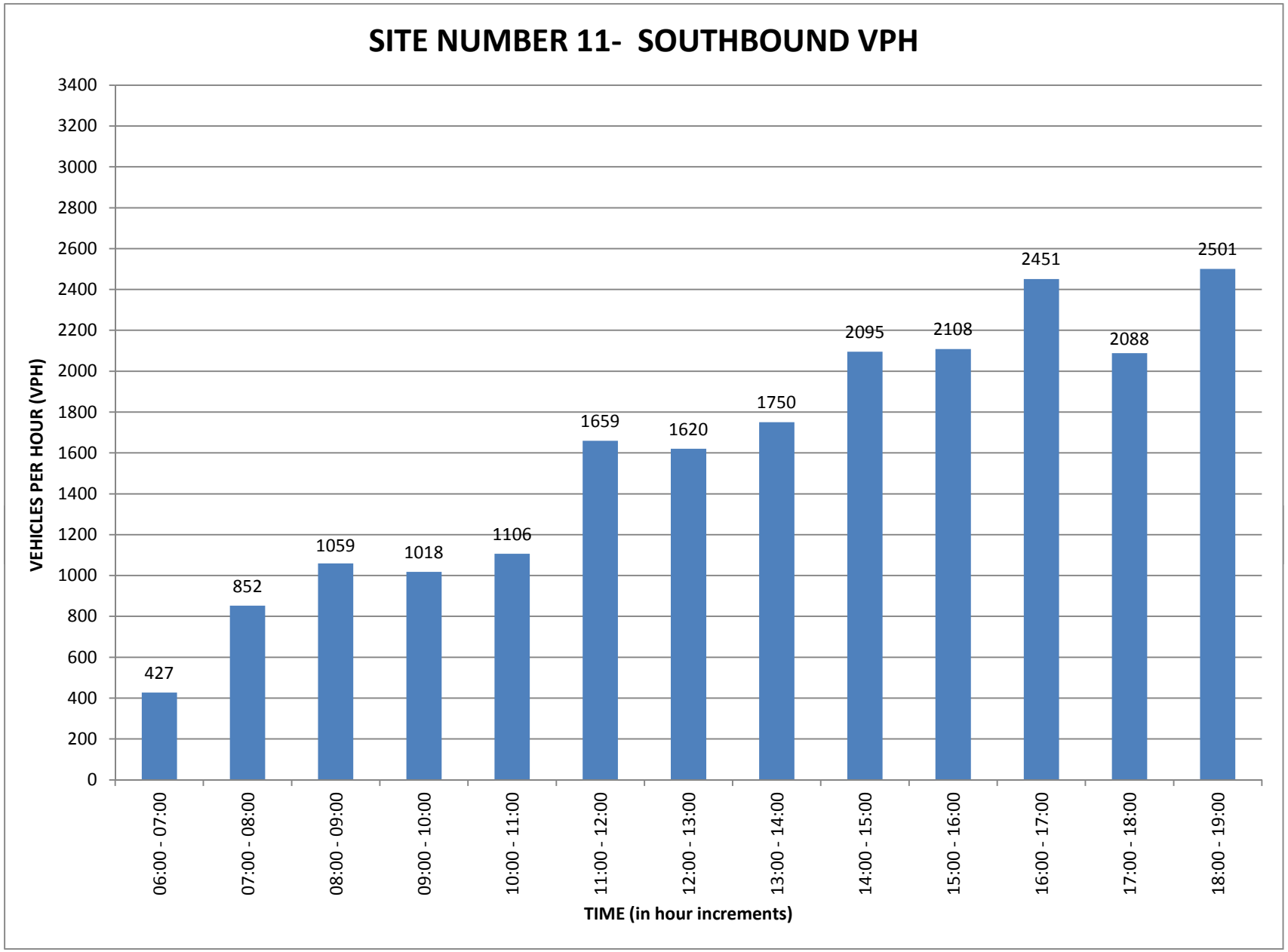
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 11- SOUTHBOUND VPH
VEHICLES PER HOUR (VPH)
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2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
427
852
1059
1018
1106
1659
1620
1750
2095
2108
2451
2088
2501
06:00 - 07:00
07:00 - 08:00
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11:00 - 12:00
12:00 - 13:00
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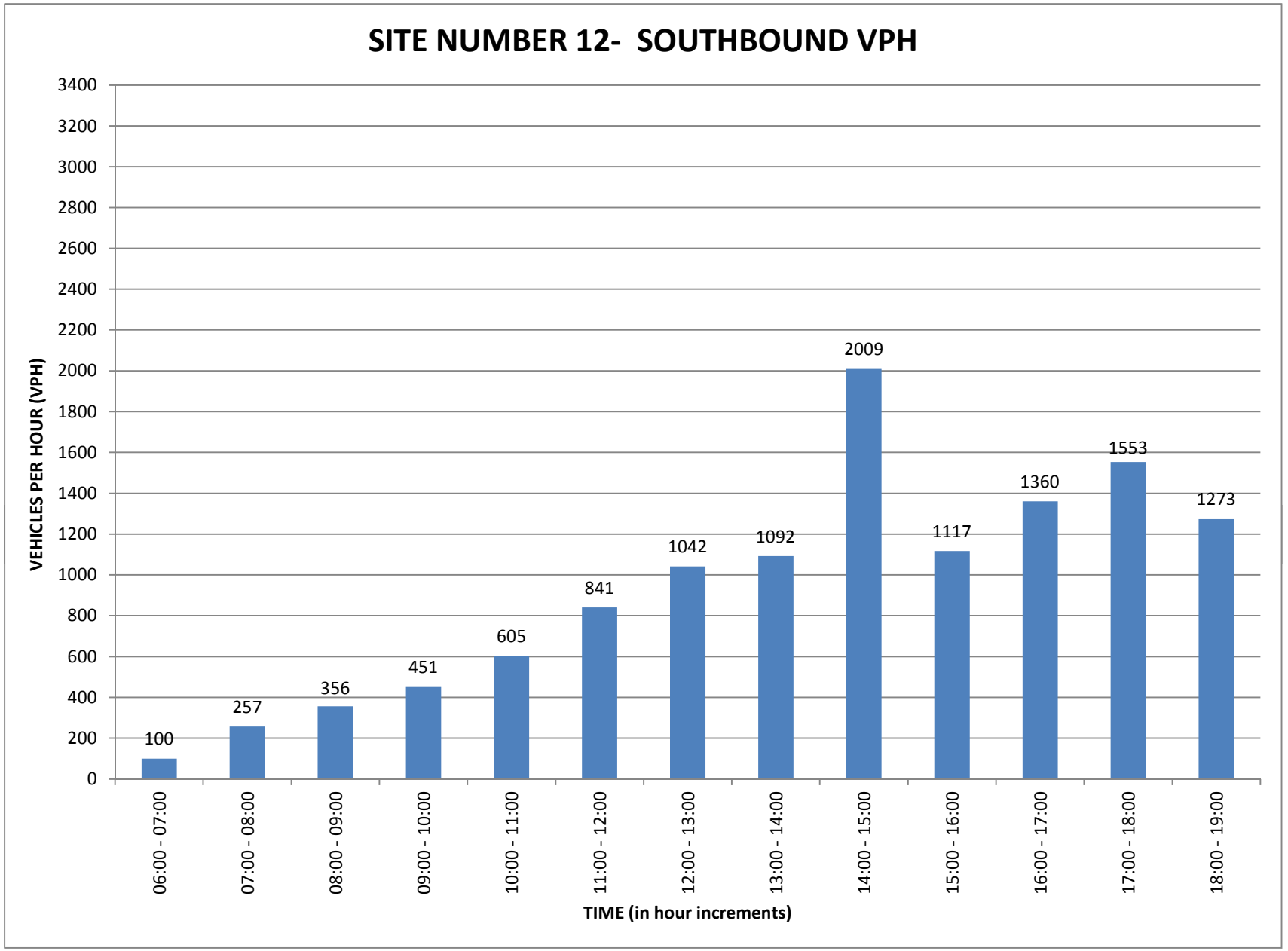
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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2400
2200
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1800
1600
1400
1200
1000
800
600
400
200
0
100
257
356
451
605
841
1042
1092
2009
1117
1360
1553
1273
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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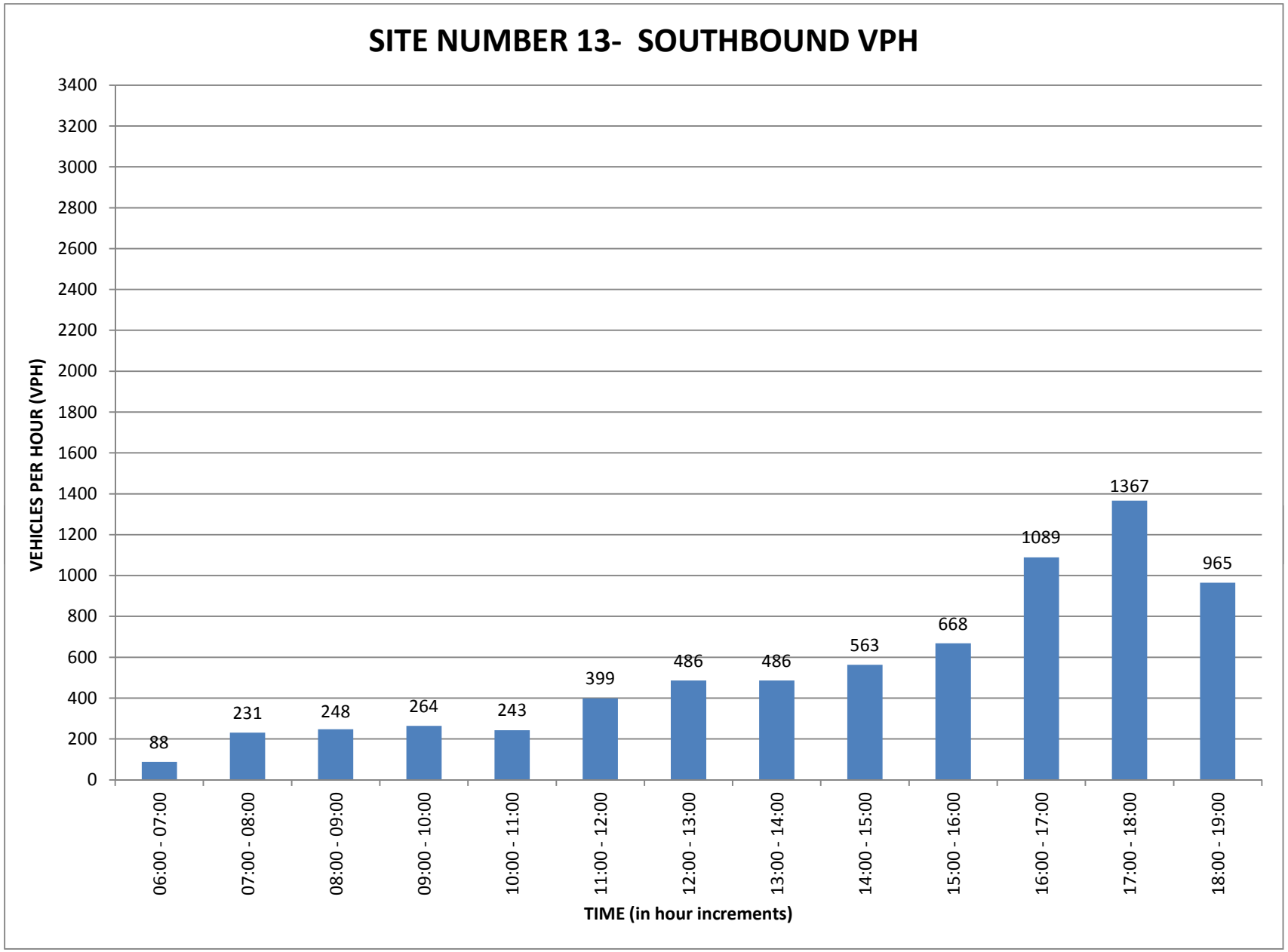
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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VEHICLES PER HOUR (VPH)
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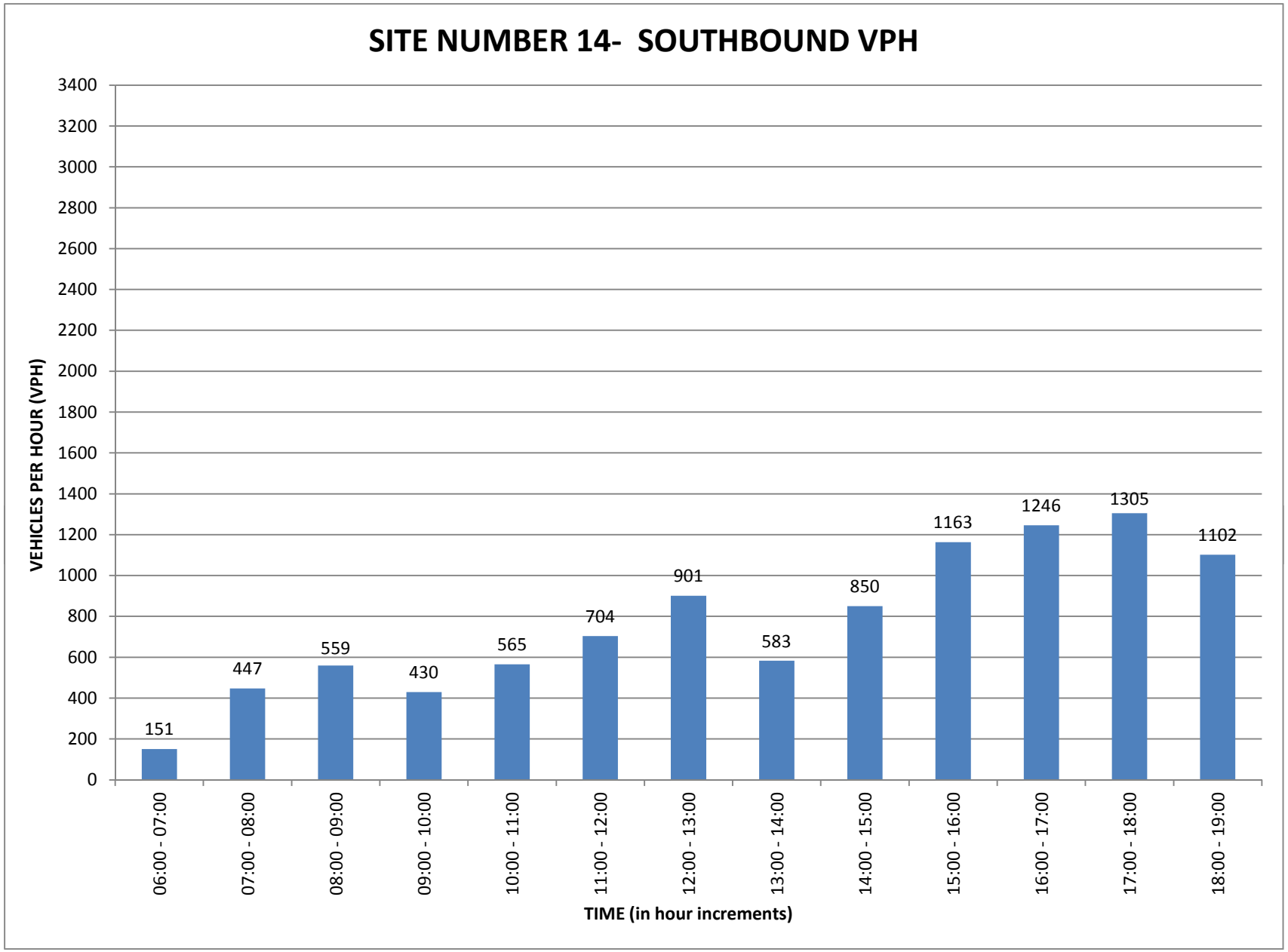
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
88
231
248
264
243
399
486
486
563
668
1089
1367
965
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 14- SOUTHBOUND VPH
VEHICLES PER HOUR (VPH)
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3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
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447
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583
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1246
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06:00 - 07:00
07:00 - 08:00
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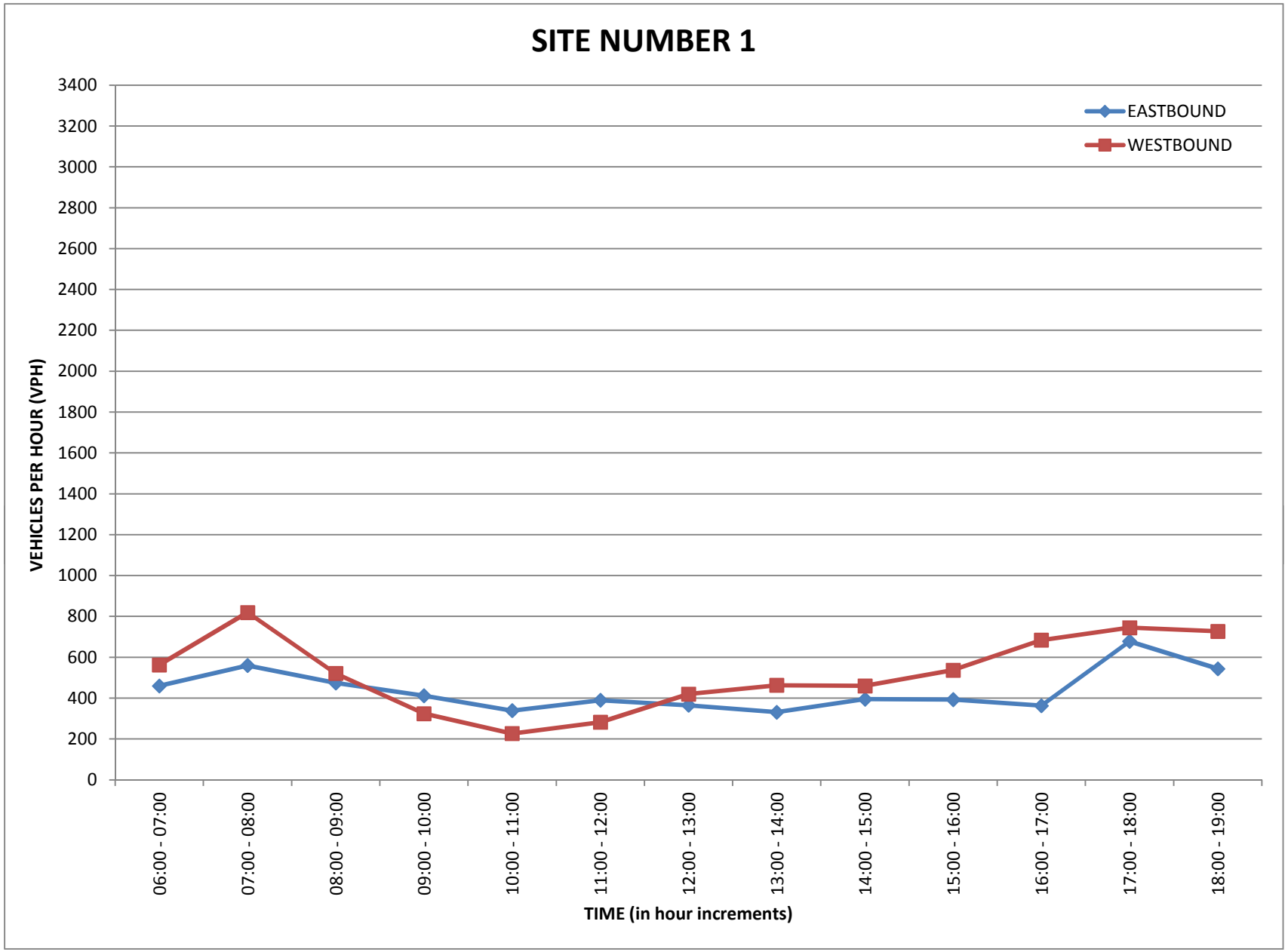
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						
				6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13
1	FM 1626 between S. 1st Street and Old San Antonio Road	E	10-02	460	560	474	412	339	390	365
1	FM 1626 between S. 1st Street and Old San Antonio Road	W	10-3	563	819	521	324	227	282	420
2	FM 1626 between Brodie Ln and Johnson Ln (south)	E	10-02	1077	956	779	621	498	530	471
2	FM 1626 between Brodie Ln and Johnson Ln (south)	W	10-3	188	336	355	333	332	382	448
2A	Brodie Ln between Green Emerald and Twilight	N	10-02	540	543	546	558	444	454	435
2A	Brodie Ln between Green Emerald and Twilight	S	10-3	86	342	322	235	283	357	400
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	N	10-02	1098	1197	697	504	701	624	601
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	S	10-3	426	470	480	457	535	522	578
4	Slaughter Ln just east of Manchaca Rd/FM 2304	E	10-3	738	1129	1103	922	869	1093	1060
4	Slaughter Ln just east of Manchaca Rd/FM 2304	W	10-02	697	1266	1015	885	859	865	890
5	Slaughter Ln just east of Brodie Ln	E	10-3	405	787	883	671	666	830	936
5	Slaughter Ln just east of Brodie Ln	W	10-02	782	1375	1158	952	797	779	944
6	Brodie Ln just south of Slaughter Ln	N	10-02	1003	1241	1070	991	811	688	666
6	Brodie Ln just south of Slaughter Ln	S	10-3	925	819	479	378	479	620	705
7	Slaughter Ln just east of Loop 1 (MoPac)	E	10-3	266	683	786	572	686	786	962
7	Slaughter Ln just east of Loop 1 (MoPac)	W	10-02	975	1229	1091	664	722	849	957
8	Slaughter Ln just west of Loop 1 (MoPac)	E	10-02	471	1017	966	719	621	668	674
8	Slaughter Ln just west of Loop 1 (MoPac)	W	10-3	192	508	652	560	601	660	696
9	Loop 1 (MoPac) just south of William Cannon	N	10-02	1595	2340	2262	2156	1696	1518	1511
9	Loop 1 (MoPac) just south of William Cannon	S	10-3	431	785	995	1050	1131	1565	1711
9A	William Cannon just west of IH 34	E	10-02	566	864	641	611	615	727	824
9A	William Cannon just west of IH 34	W	10-3	516	921	901	844	831	1030	1059
10	William Cannon just west of Loop 1 (Mopac)	E	10-02	493	674	722	773	599	642	1013
10	William Cannon just west of Loop 1 (Mopac)	W	10-3	443	790	937	930	915	1143	1250
11	Loop 1 (MoPac) just north of William Cannon	N	10-02	2090	1924	1992	2545	1991	1833	1654
11	Loop 1 (MoPac) just north of William Cannon	S	10-3	427	852	1059	1018	1106	1659	1620
12	Brodie Ln between US 290/71/Ben White & William Cannon	N	10-02	445	987	721	572	305	349	1035
12	Brodie Ln between US 290/71/Ben White & William Cannon	S	10-3	100	257	356	451	605	841	1042
13	Westgate between Jones Rd and West Stasney Ln	N	10-02	455	1292	1095	586	472	453	536
13	Westgate between Jones Rd and West Stasney Ln	S	10-3	88	231	248	264	243	399	486
14	Manchaca Rd just north of Jones Rd	N	10-02	1329	1691	1310	839	715	750	808
14	Manchaca Rd just north of Jones Rd	S	10-3	151	447	559	430	565	704	901

Site No.	Approximate Location or Intersection	DIRECTION	DATE	VEHICLES PER HOUR (VPH)						13 HR TOTAL
				13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	
1	FM 1626 between S. 1st Street and Old San Antonio Road	E	10-02	331	395	393	363	678	544	**5,704**
1	FM 1626 between S. 1st Street and Old San Antonio Road	W	10-3	463	460	537	684	745	727	**6,772**
2	FM 1626 between Brodie Ln and Johnson Ln (south)	E	10-02	449	217	464	516	629	539	**7,746**
2	FM 1626 between Brodie Ln and Johnson Ln (south)	W	10-3	517	569	689	876	1066	823	**6,914**
2A	Brodie Ln between Green Emerald and Twilight	N	10-02	414	493	447	461	580	513	**6,428**
2A	Brodie Ln between Green Emerald and Twilight	S	10-3	451	647	580	799	851	789	**6,142**
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	N	10-02	729	686	752	869	680	685	**9,823**
3	Manchaca Rd/FM 2304 just south of Slaughter Ln	S	10-3	633	774	806	1055	1269	1137	**9,142**
4	Slaughter Ln just east of Manchaca Rd/FM 2304	E	10-3	1072	1179	1244	1594	1476	1475	**14,954**
4	Slaughter Ln just east of Manchaca Rd/FM 2304	W	10-02	878	981	1173	1138	1364	1321	**13,332**
5	Slaughter Ln just east of Brodie Ln	E	10-3	974	1022	1249	1585	1697	1396	**13,101**
5	Slaughter Ln just east of Brodie Ln	W	10-02	950	986	1007	1130	1171	986	**13,017**
6	Brodie Ln just south of Slaughter Ln	N	10-02	722	734	704	702	796	687	**10,815**
6	Brodie Ln just south of Slaughter Ln	S	10-3	824	872	1032	1258	1254	1350	**10,995**
7	Slaughter Ln just east of Loop 1 (MoPac)	E	10-3	864	1020	1237	1371	1602	1489	**12,324**
7	Slaughter Ln just east of Loop 1 (MoPac)	W	10-02	951	949	827	1105	1102	917	**12,338**
8	Slaughter Ln just west of Loop 1 (MoPac)	E	10-02	625	601	751	820	872	797	**9,602**
8	Slaughter Ln just west of Loop 1 (MoPac)	W	10-3	762	863	943	1123	1095	875	**9,530**
9	Loop 1 (MoPac) just south of William Cannon	N	10-02	1508	1407	1470	1622	1641	1528	**22,254**
9	Loop 1 (MoPac) just south of William Cannon	S	10-3	2011	2328	2546	3293	3378	2757	**23,981**
9A	William Cannon just west of IH 34	E	10-02	820	856	951	1030	1039	941	**10,485**
9A	William Cannon just west of IH 34	W	10-3	1112	1039	1275	1303	1293	1218	**13,342**
10	William Cannon just west of Loop 1 (Mopac)	E	10-02	787	1098	1024	1024	1176	1093	**11,118**
10	William Cannon just west of Loop 1 (Mopac)	W	10-3	997	1098	1250	1267	1517	1409	**13,946**
11	Loop 1 (MoPac) just north of William Cannon	N	10-02	2092	1882	1788	1695	1735	1435	**24,656**
11	Loop 1 (MoPac) just north of William Cannon	S	10-3	1750	2095	2108	2451	2088	2501	**20,734**
12	Brodie Ln between US 290/71/Ben White & William Cannon	N	10-02	937	667	299	327	403	823	**7,870**
12	Brodie Ln between US 290/71/Ben White & William Cannon	S	10-3	1092	2009	1117	1360	1553	1273	**12,056**
13	Westgate between Jones Rd and West Stasney Ln	N	10-02	535	547	467	432	498	505	**7,873**
13	Westgate between Jones Rd and West Stasney Ln	S	10-3	486	563	668	1089	1367	965	**7,097**
14	Manchaca Rd just north of Jones Rd	N	10-02	802	822	667	787	814	303	**11,637**
14	Manchaca Rd just north of Jones Rd	S	10-3	583	850	1163	1246	1305	1102	**10,006**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WESTBOUND
VEHICLES PER HOUR (VPH)
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3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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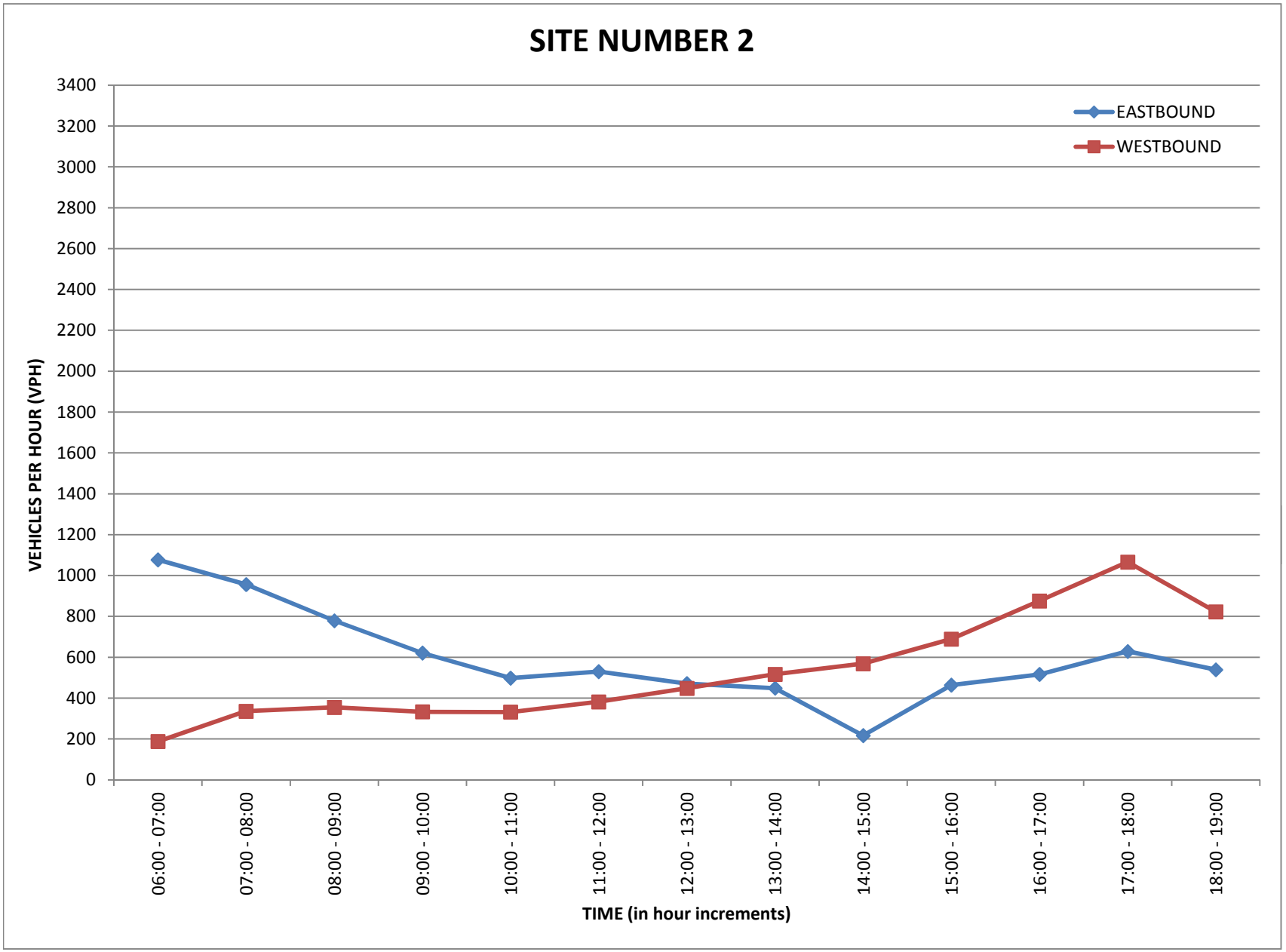
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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WESTBOUND
VEHICLES PER HOUR (VPH)
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2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
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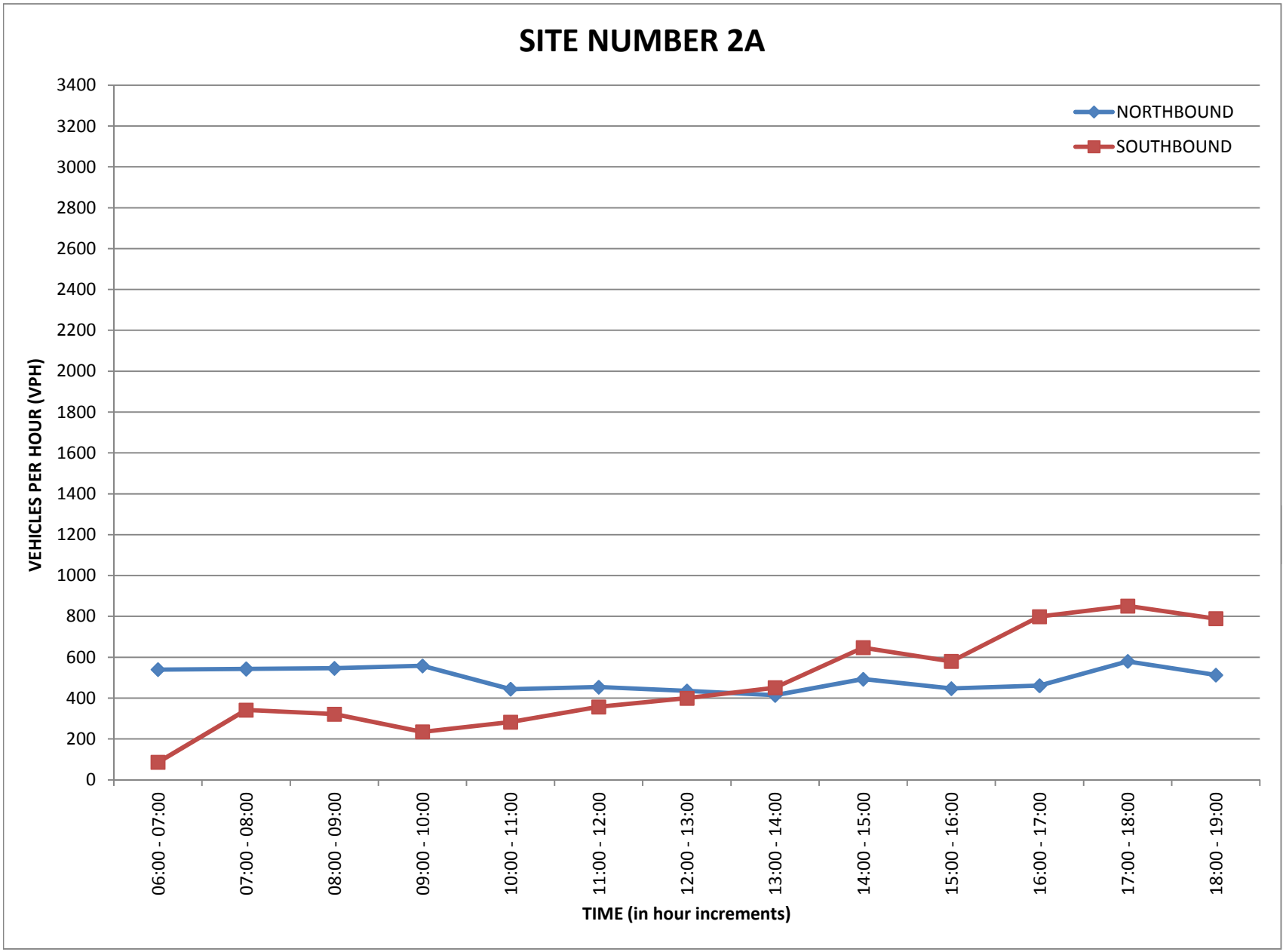
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
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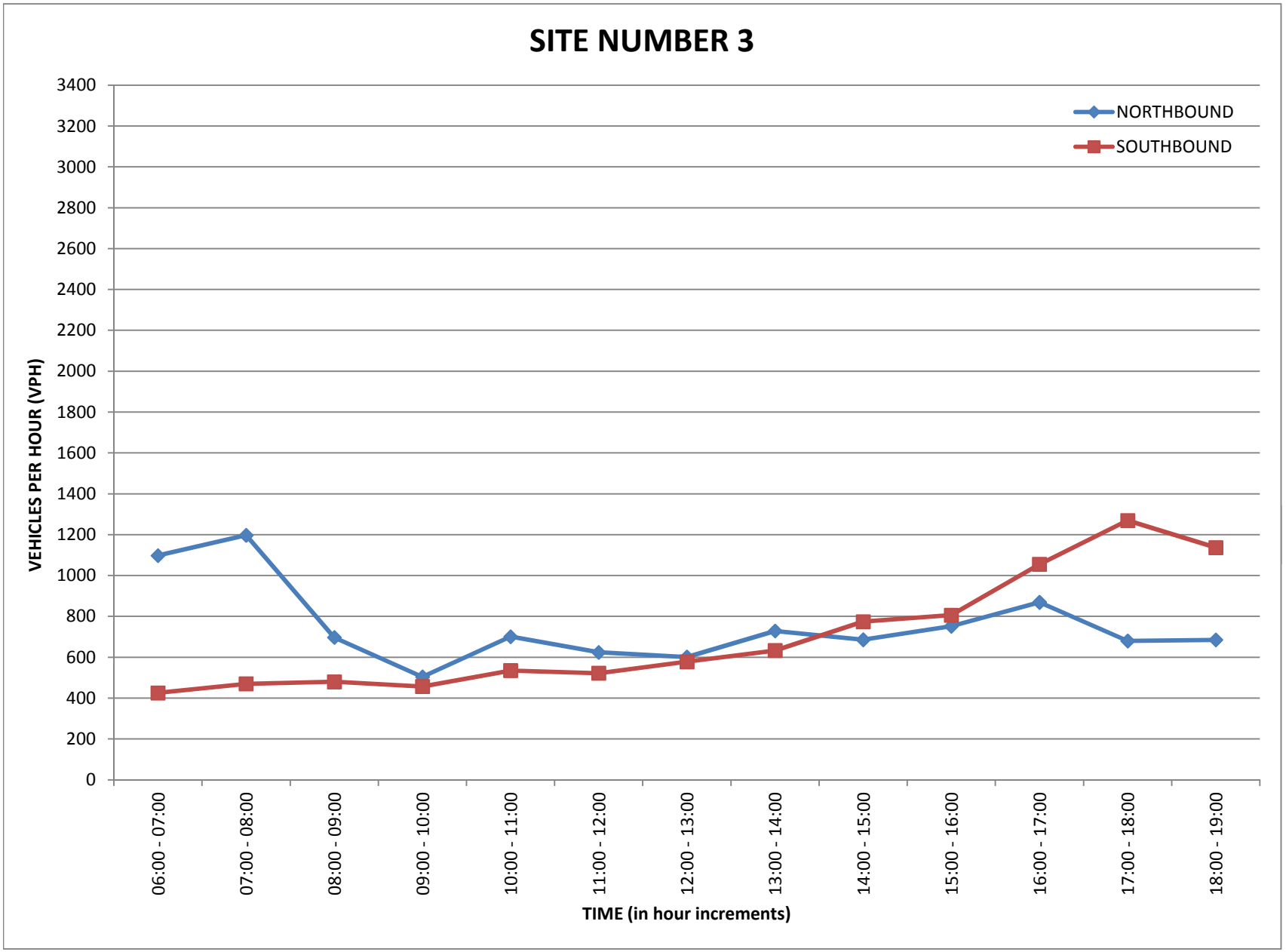
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
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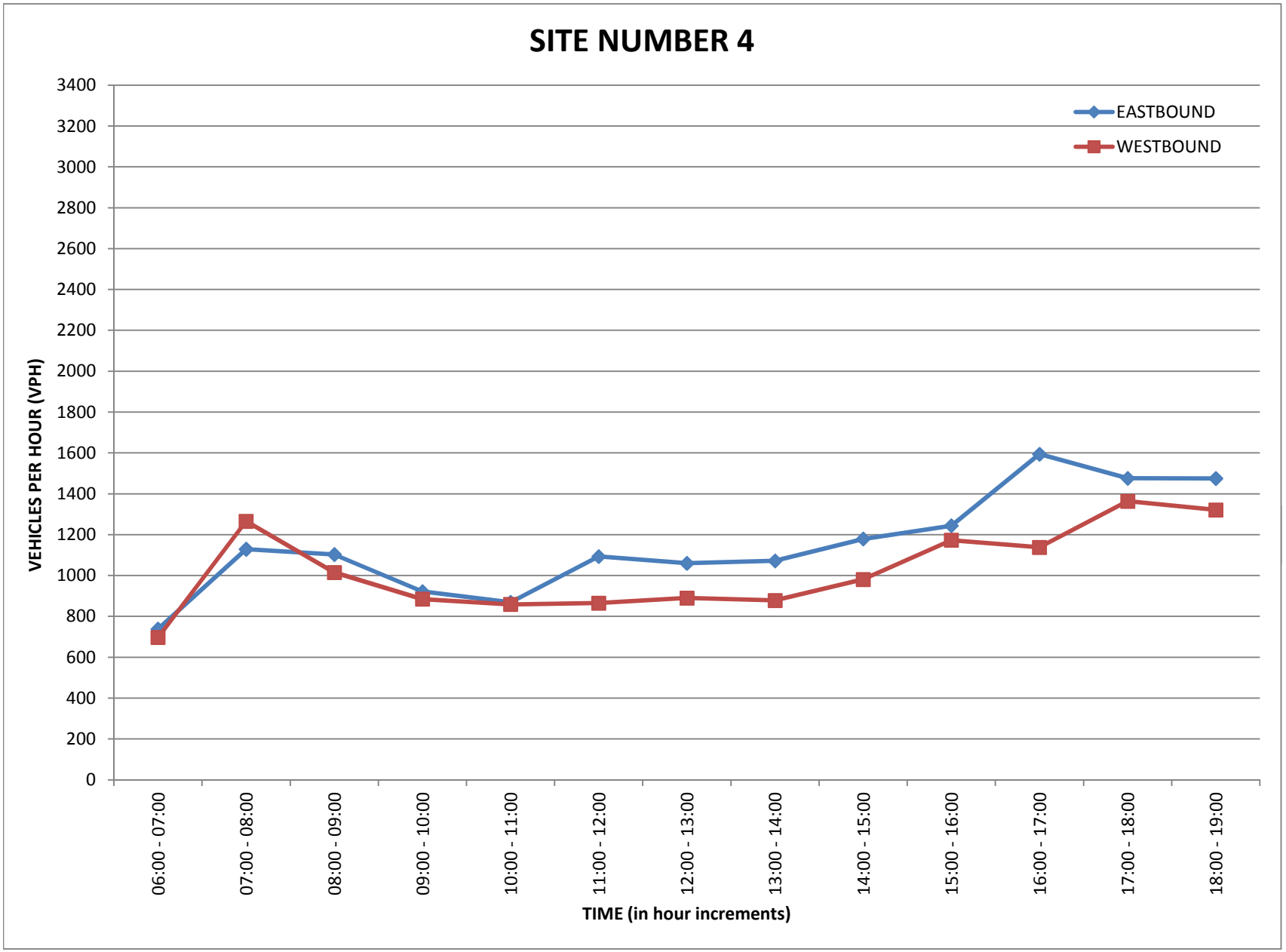
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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WESTBOUND
VEHICLES PER HOUR (VPH)
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2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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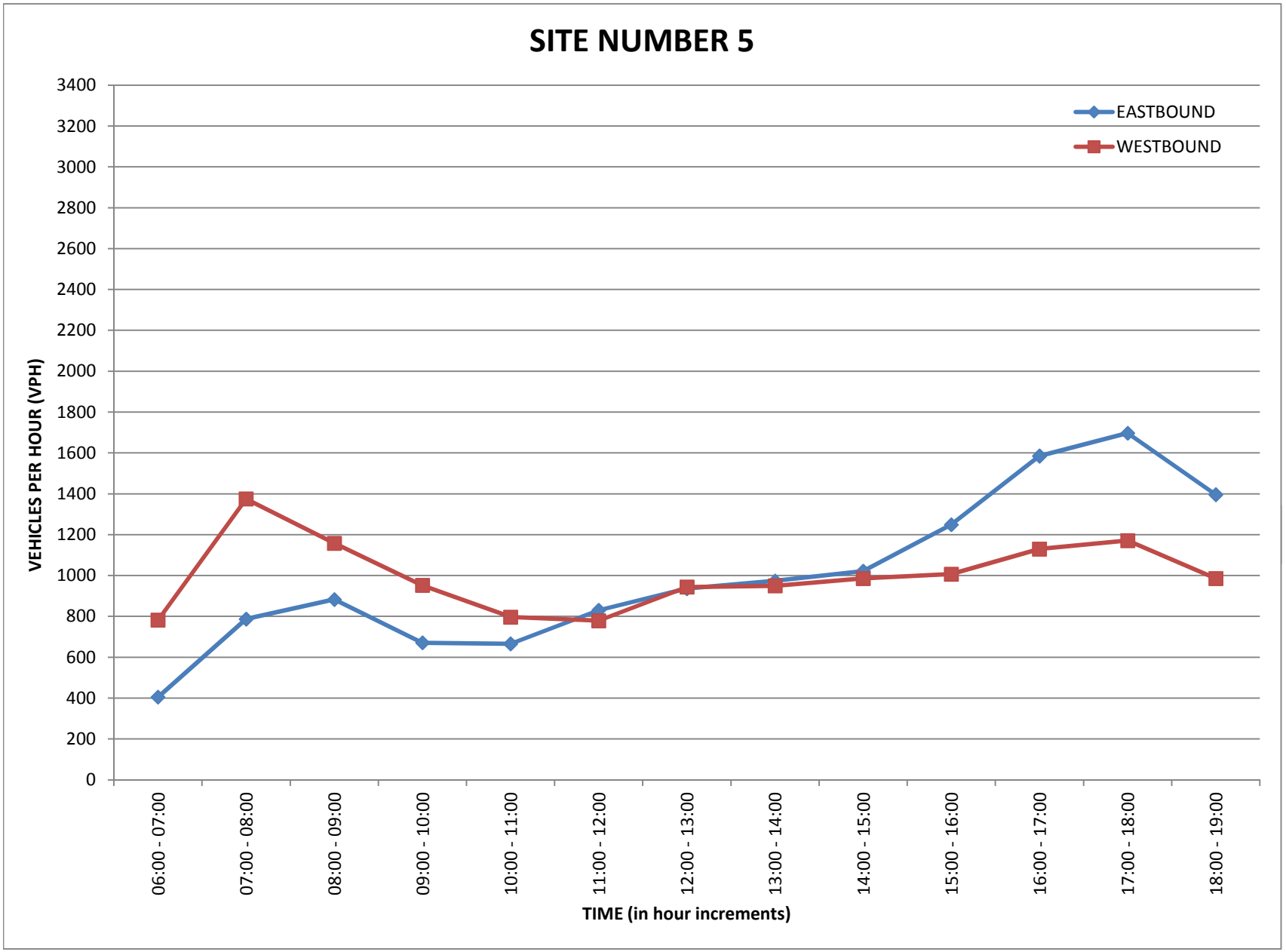
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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EASTBOUND
WESTBOUND
VEHICLES PER HOUR (VPH)
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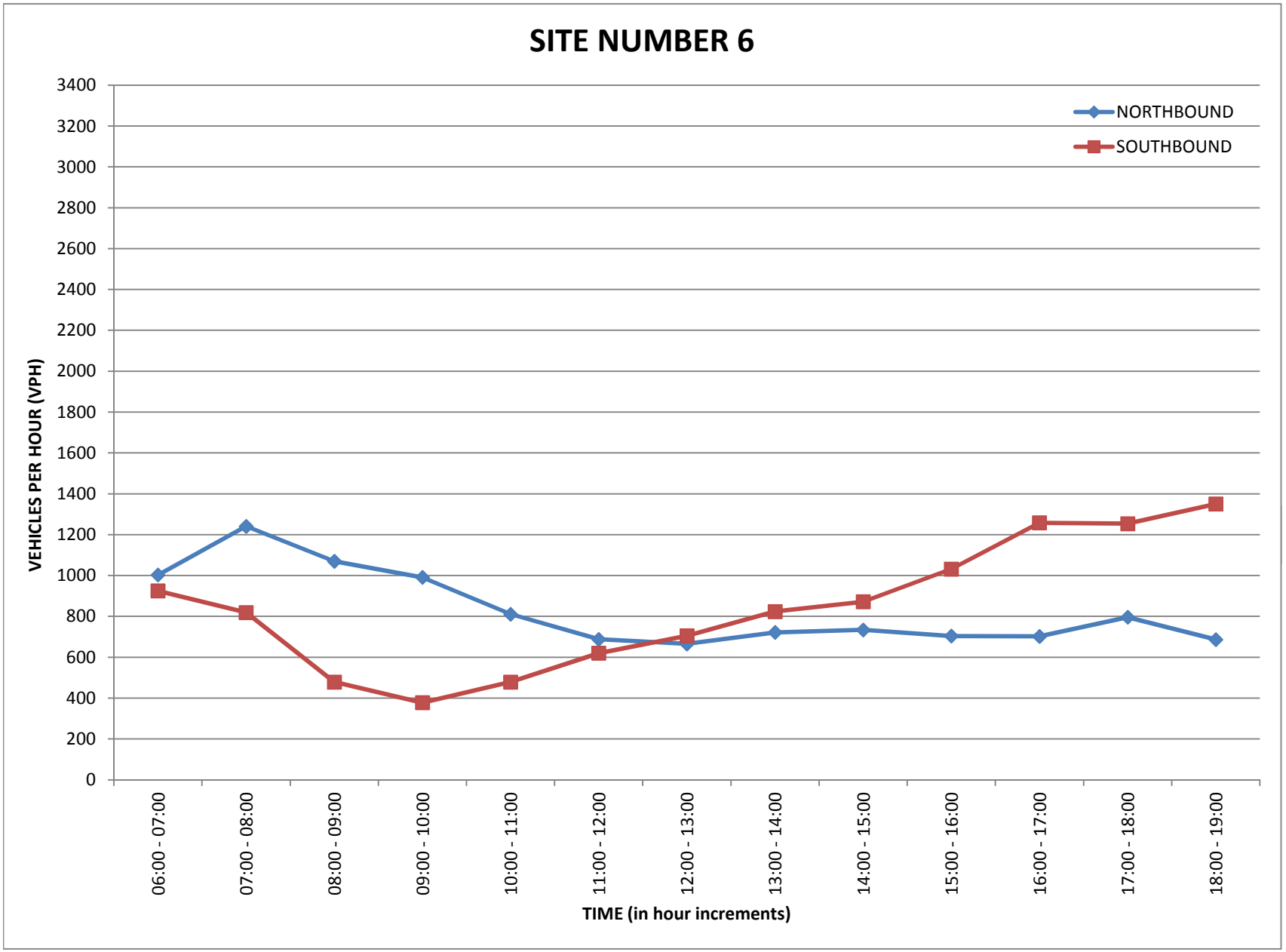
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 6
NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
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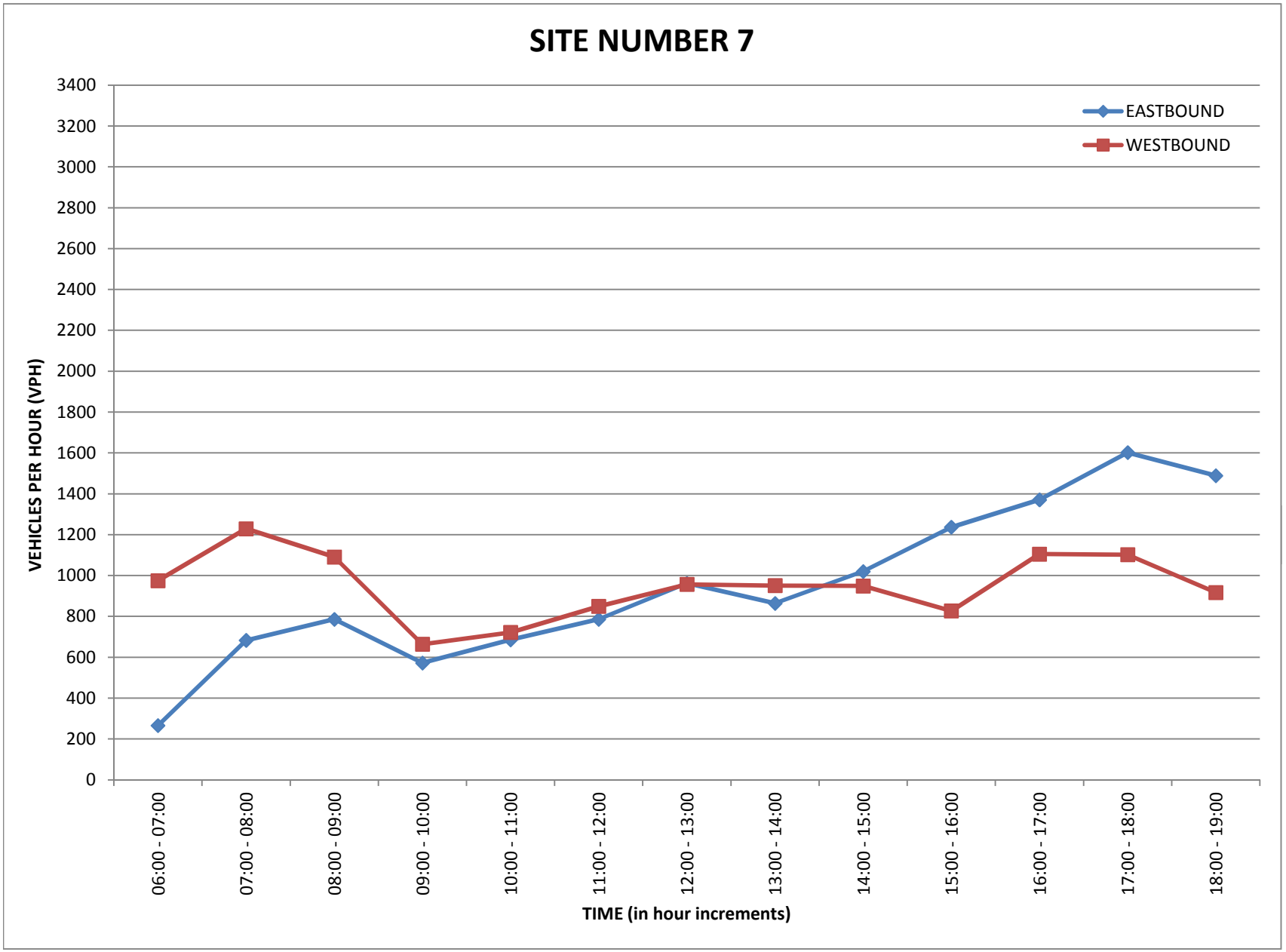
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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WESTBOUND
VEHICLES PER HOUR (VPH)
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2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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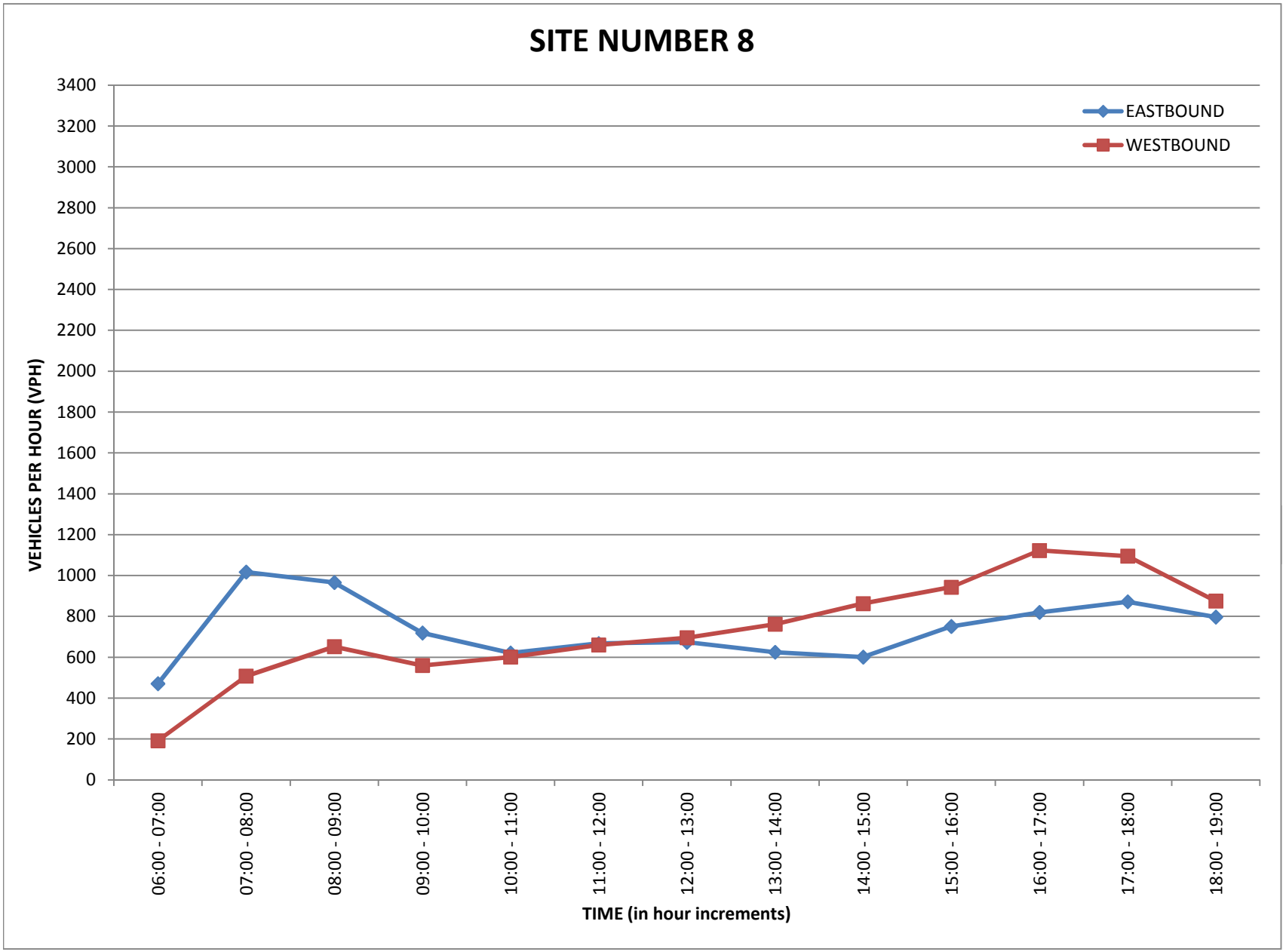
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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WESTBOUND
VEHICLES PER HOUR (VPH)
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2200
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1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
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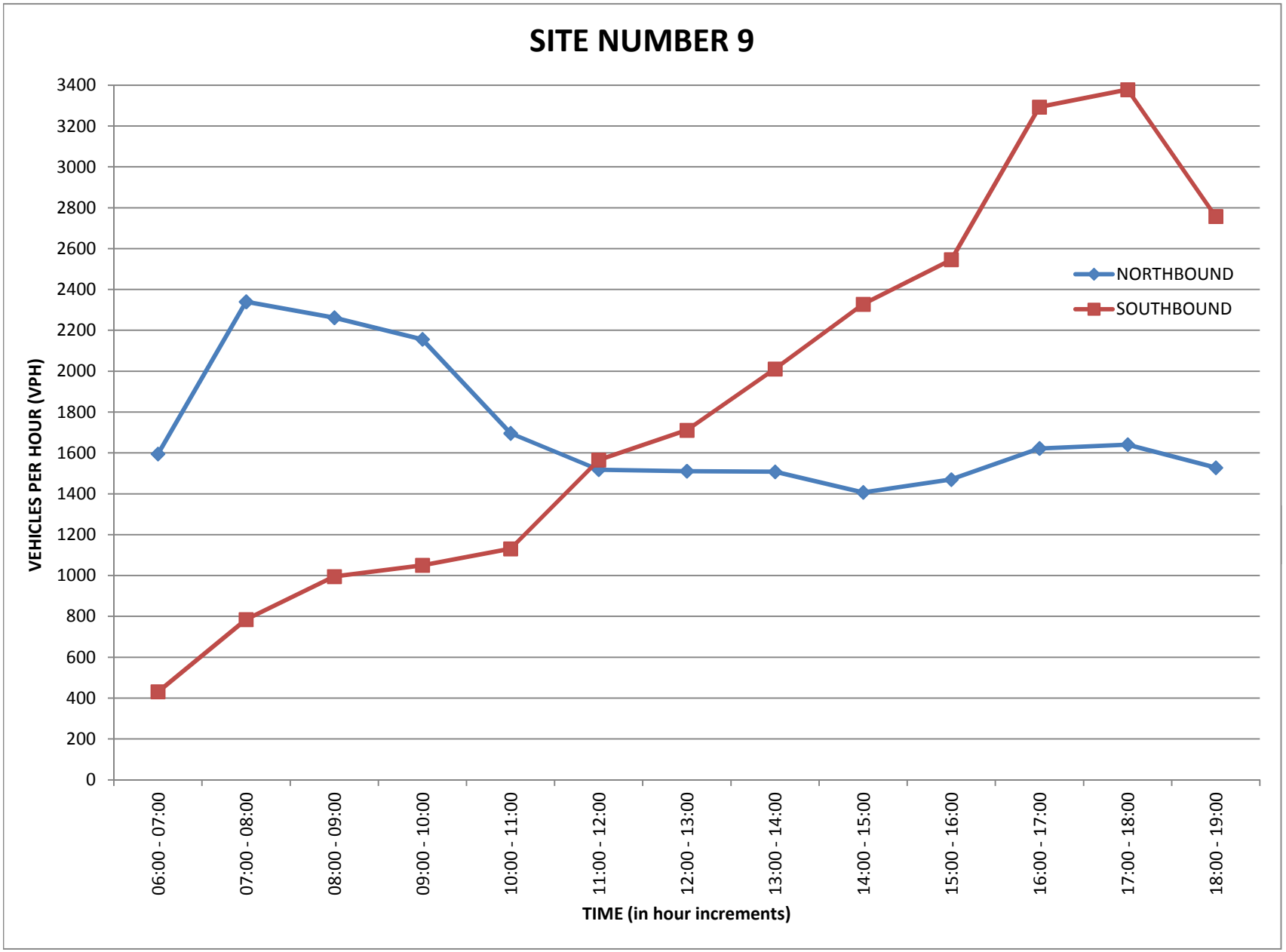
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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VEHICLES PER HOUR (VPH)
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2200
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1800
1600
1400
1200
1000
800
600
400
200
0
NORTHBOUND
SOUTHBOUND
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
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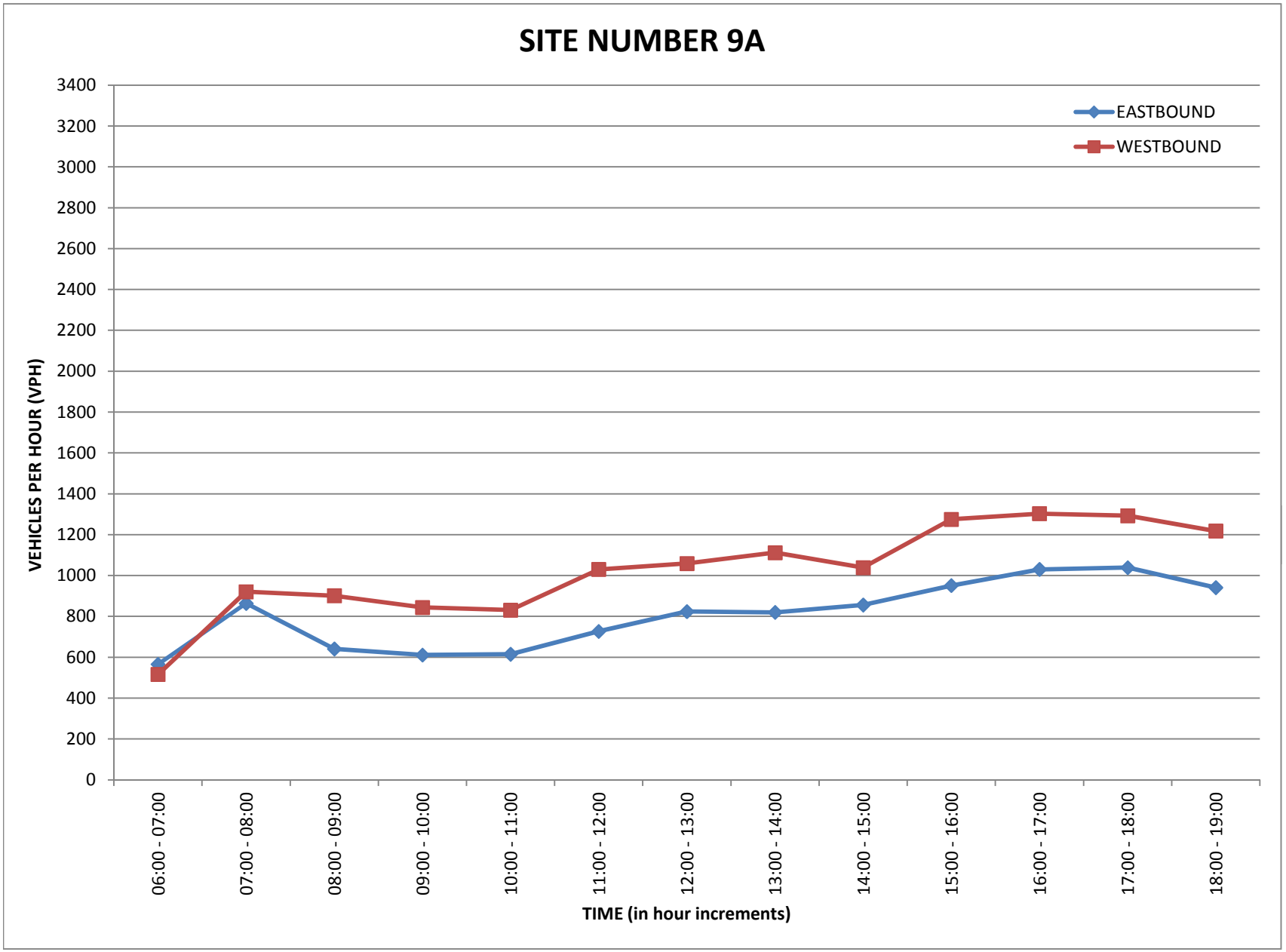
TIME (in hour increments)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WESTBOUND
VEHICLES PER HOUR (VPH)
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1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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15:00 - 16:00
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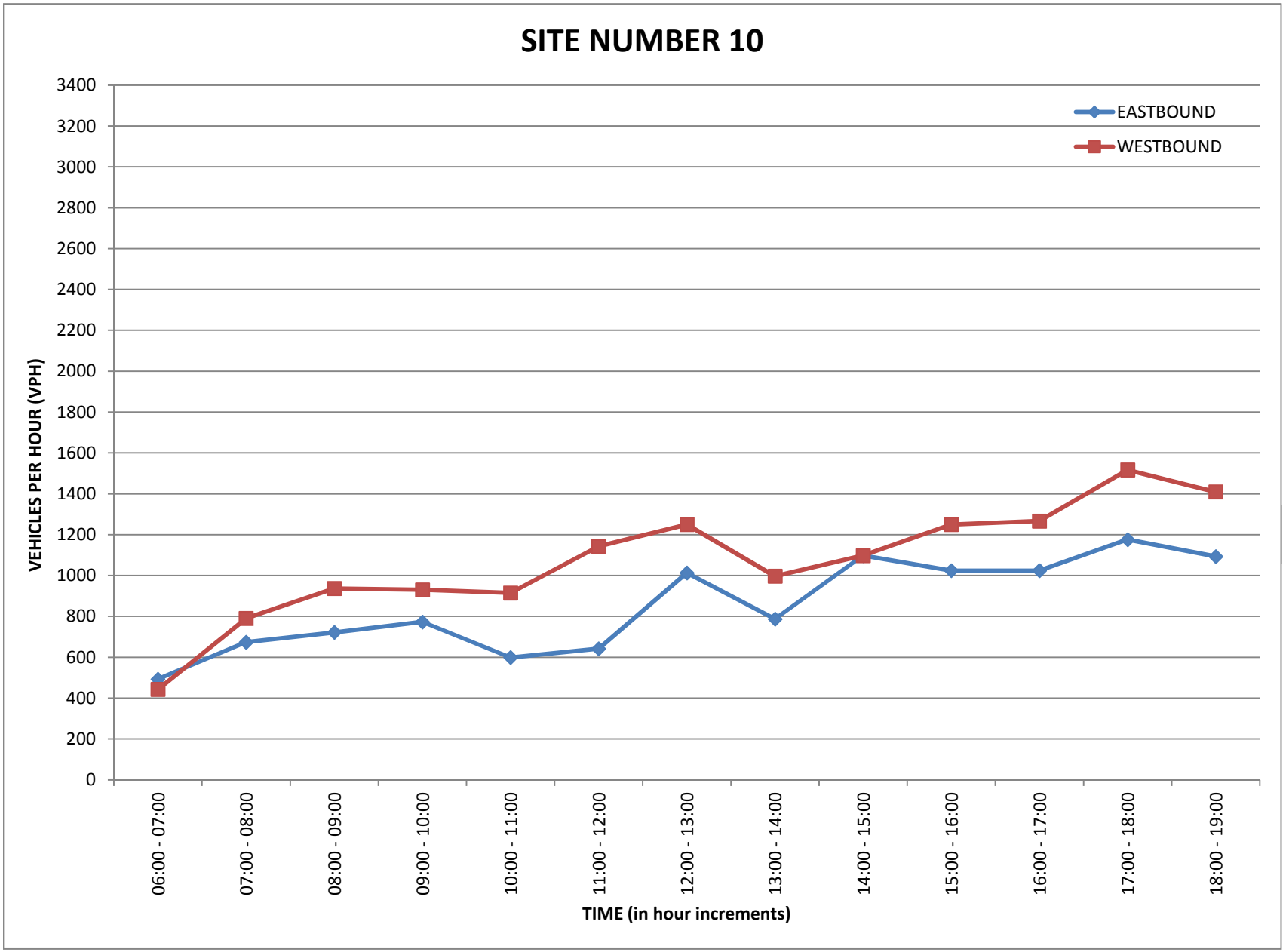
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
VEHICLES PER HOUR (VPH)
EASTBOUND
WESTBOUND
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
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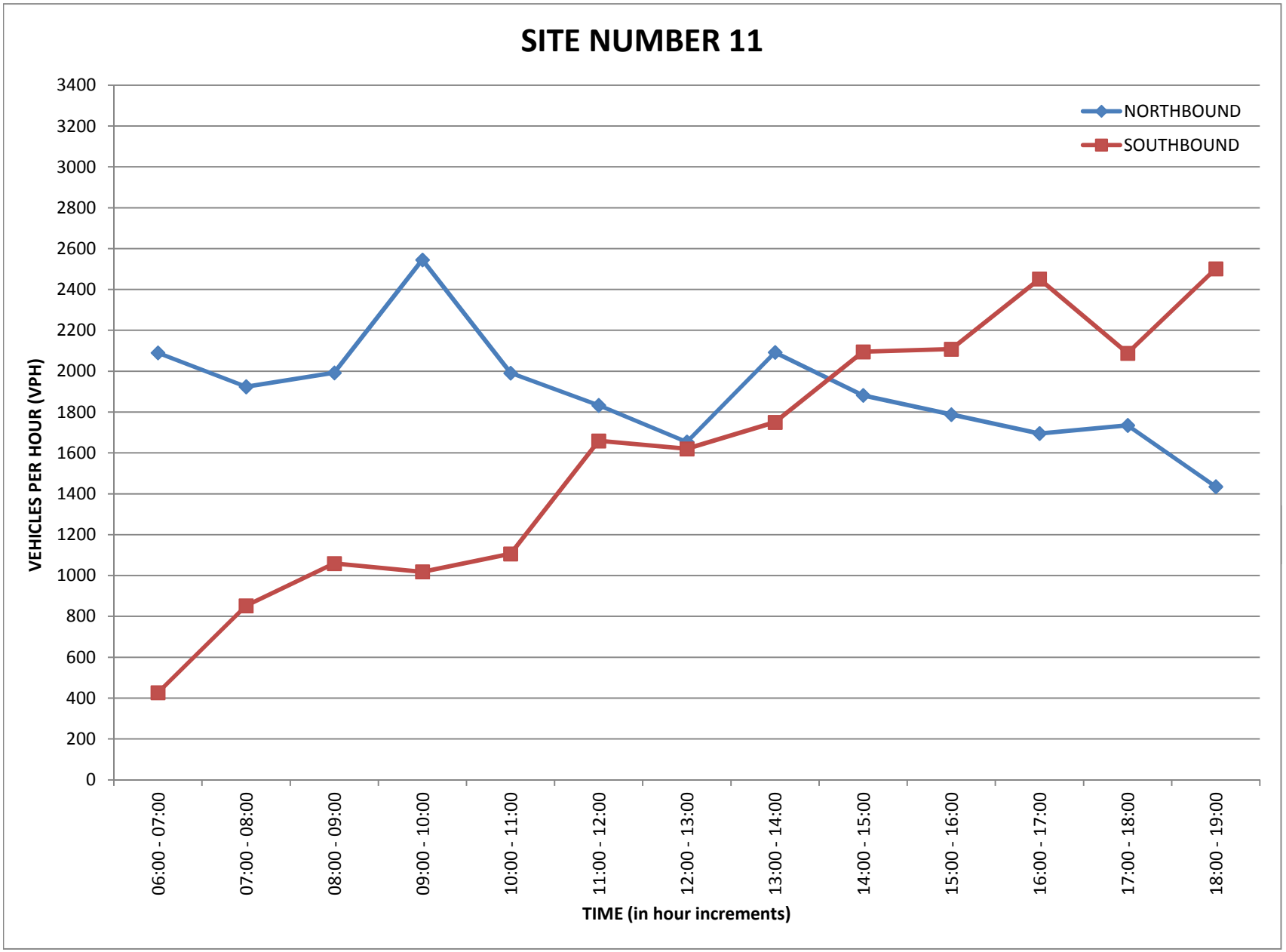
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
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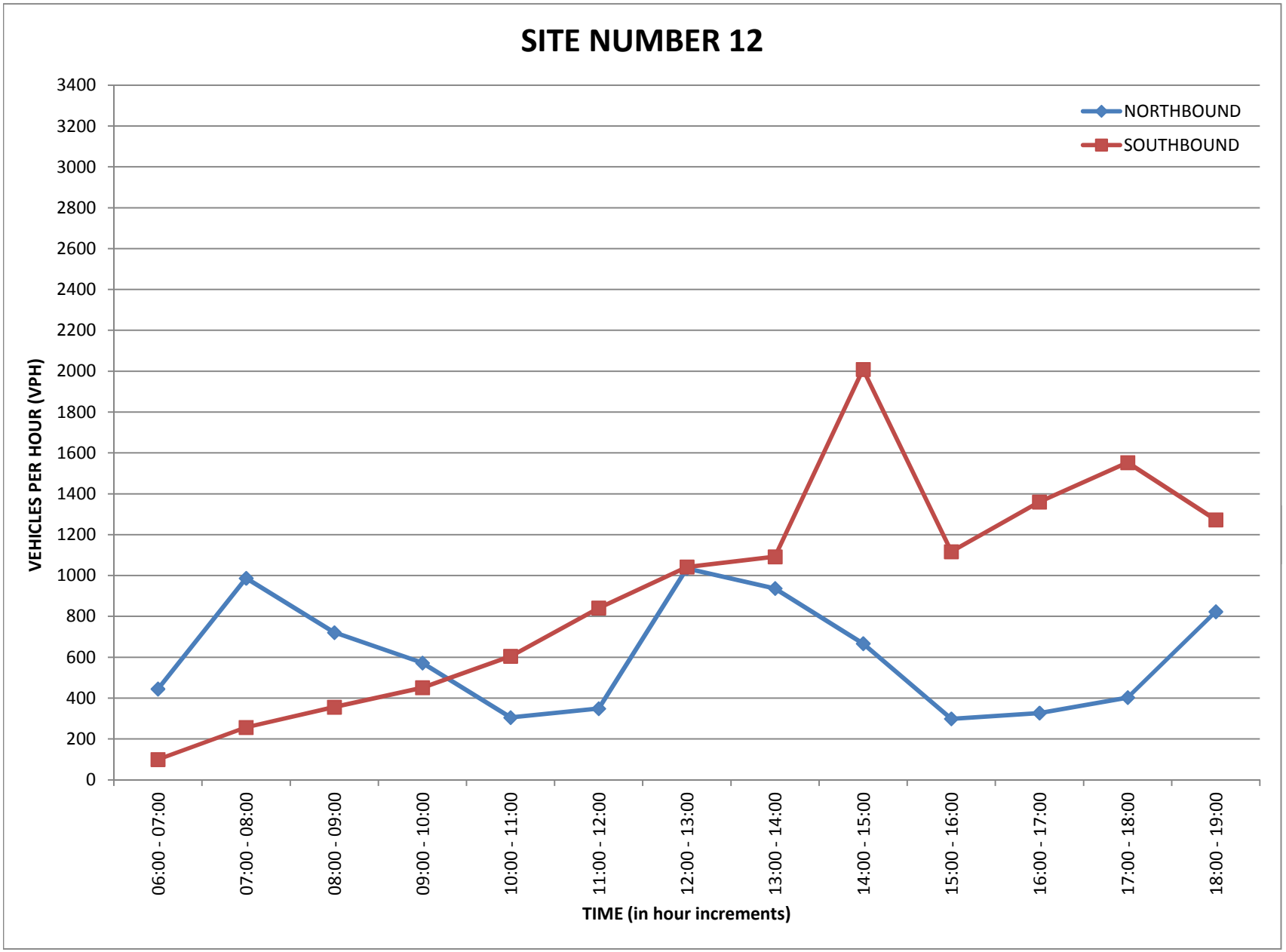
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)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SOUTHBOUND
VEHICLES PER HOUR (VPH)
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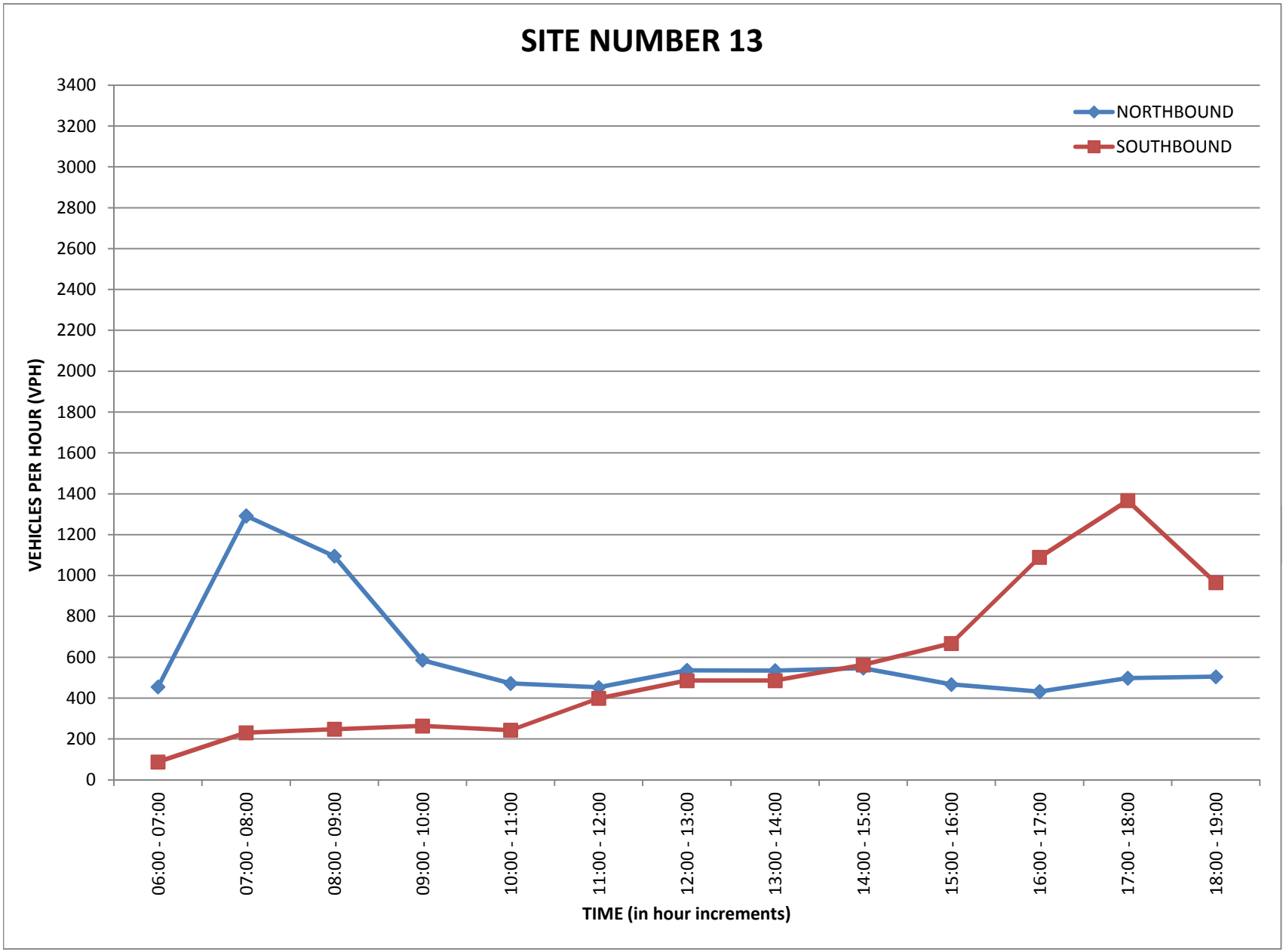
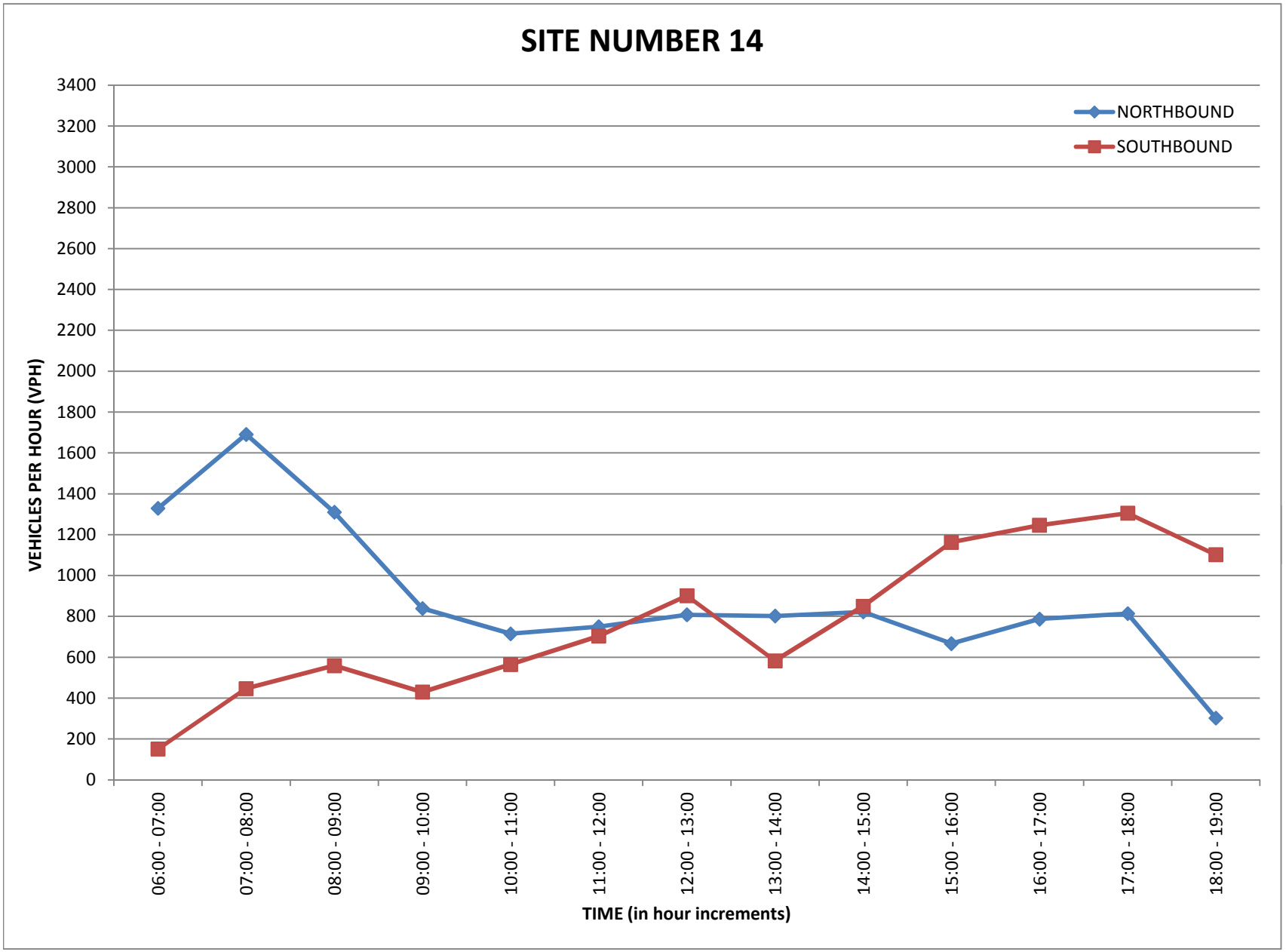
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 13
NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)


SITE NUMBER 14
NORTHBOUND
SOUTHBOUND
VEHICLES PER HOUR (VPH)
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
06:00 - 07:00
07:00 - 08:00
08:00 - 09:00
09:00 - 10:00
10:00 - 11:00
11:00 - 12:00
12:00 - 13:00
13:00 - 14:00
14:00 - 15:00
15:00 - 16:00
16:00 - 17:00
17:00 - 18:00
18:00 - 19:00
TIME (in hour increments)

Inbound 13 Hour ALPR Counts (10/02/2013 Plate Collection Commenced at 6 am)							
Station Description	**Direction**	**Station Number**	**Number of Passenger Vehicles**	**% of Passenger Vehicles**	**Number of Commercial Vehicles**	**% of Commercial Vehicles**	**Total Number of Vehicles**
FM 1626 between S. 1st Street and Old San Antonio Road	E	**1**	5,648	99.02%	56	0.98%	5,704
FM 1626 between Brodie Ln and Johnson Ln (south)	E	**2**	7,575	97.79%	171	2.21%	7,746
Brodie Ln between Green Emerald and Twilight	N	**2A**	6,378	99.22%	50	0.78%	6,428
Manchaca Rd/FM 2304 just south of Slaughter Ln	N	**3**	9,787	99.63%	36	0.37%	9,823
Slaughter Ln just east of Manchaca Rd/FM 2304	W	**4**	13,289	99.68%	43	0.32%	13,332
Slaughter Ln just east of Brodie Ln	W	**5**	12,989	99.78%	28	0.22%	13,017
Brodie Ln just south of Slaughter Ln	N	**6**	10,789	99.76%	26	0.24%	10,815
Slaughter Ln just east of Loop 1 (MoPac)	W	**7**	12,313	99.80%	25	0.20%	12,338
Slaughter Ln just west of Loop 1 (MoPac)	E	**8**	9,592	99.90%	10	0.10%	9,602
Loop 1 (MoPac) just south of William Cannon	N	**9**	22,225	99.87%	29	0.13%	22,254
William Cannon just west of IH 34	E	**9A**	10,457	99.73%	28	0.27%	10,485
William Cannon just west of Loop 1 (Mopac)	E	**10**	11,100	99.84%	18	0.16%	11,118
Loop 1 (MoPac) just north of William Cannon	N	**11**	24,636	99.92%	20	0.08%	24,656
Brodie Ln between US 290/71/Ben White & William Cannon	N	**12**	7,851	99.76%	19	0.24%	7,870
Westgate between Jones Rd and West Stasney Ln	N	**13**	7,870	99.96%	3	0.04%	7,873
Manchaca Rd just north of Jones Rd	N	**14**	11,610	99.77%	27	0.23%	11,637

Outbound 13 Hour ALPR Counts (10/03/2013 Plate Collection Commenced at 6 am)							
Station Description	**Direction**	**Station Number**	**Number of Passenger Vehicles**	**% of Passenger Vehicles**	**Number of Commercial Vehicles**	**% of Commercial Vehicles**	**Total Number of Vehicles**
FM 1626 between S. 1st Street and Old San Antonio Road	W	**1**	6,699	98.92%	73	1.08%	6,772
FM 1626 between Brodie Ln and Johnson Ln (south)	W	**2**	6,762	97.80%	152	2.20%	6,914
Brodie Ln between Green Emerald and Twilight	S	**2A**	6,139	99.95%	3	0.05%	6,142
Manchaca Rd/FM 2304 just south of Slaughter Ln	S	**3**	9,129	99.86%	13	0.14%	9,142
Slaughter Ln just east of Manchaca Rd/FM 2304	E	**4**	14,921	99.78%	33	0.22%	14,954
Slaughter Ln just east of Brodie Ln	E	**5**	13,092	99.93%	9	0.07%	13,101
Brodie Ln just south of Slaughter Ln	S	**6**	10,991	99.96%	4	0.04%	10,995
Slaughter Ln just east of Loop 1 (MoPac)	E	**7**	12,321	99.98%	3	0.02%	12,324
Slaughter Ln just west of Loop 1 (MoPac)	W	**8**	9,526	99.96%	4	0.04%	9,530
Loop 1 (MoPac) just south of William Cannon	S	**9**	23,969	99.95%	12	0.05%	23,981
William Cannon just west of IH 34	W	**9A**	13,323	99.86%	19	0.14%	13,342
William Cannon just west of Loop 1 (Mopac)	W	**10**	13,942	99.97%	4	0.03%	13,946
Loop 1 (MoPac) just north of William Cannon	S	**11**	20,719	99.93%	15	0.07%	20,734
Brodie Ln between US 290/71/Ben White & William Cannon	S	**12**	12,018	99.68%	38	0.32%	12,056
Westgate between Jones Rd and West Stasney Ln	S	**13**	7,095	99.97%	2	0.03%	7,097
Manchaca Rd just north of Jones Rd	S	**14**	9,967	99.61%	39	0.39%	10,006

	30-Sep-13 Mon	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		30-Sep-13 Mon	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		11	148				12:00	41	150				
12:15		18	167				12:15	29	140				
12:30		6	182				12:30	40	120				
12:45		8	172	43	669		12:45	24	157	134	567	177	1236
01:00		6	170				01:00	16	140				
01:15		1	173				01:15	13	149				
01:30		2	149				01:30	10	178				
01:45		3	145	12	637		01:45	23	186	62	653	74	1290
02:00		4	140				02:00	13	159				
02:15		9	180				02:15	12	161				
02:30		5	158				02:30	8	145				
02:45		5	153	23	631		02:45	5	152	38	617	61	1248
03:00		1	188				03:00	10	111				
03:15		6	139				03:15	10	155				
03:30		6	165				03:30	8	145				
03:45		8	212	21	704		03:45	12	172	40	583	61	1287
04:00		5	185				04:00	5	136				
04:15		9	174				04:15	5	149				
04:30		23	189				04:30	6	85				
04:45		30	179	67	727		04:45	5	65	21	435	88	1162
05:00		29	185				05:00	17	69				
05:15		55	217				05:15	19	80				
05:30		66	173				05:30	26	75				
05:45		89	174	239	749		05:45	34	73	96	297	335	1046
06:00		114	148				06:00	40	109				
06:15		213	149				06:15	63	101				
06:30		282	168				06:30	70	187				
06:45		284	146	893	611		06:45	94	136	267	533	1160	1144
07:00		260	148				07:00	93	183				
07:15		238	139				07:15	114	161				
07:30		267	138				07:30	129	172				
07:45		279	122	1044	547		07:45	116	152	452	668	1496	1215
08:00		253	103				08:00	107	190				
08:15		260	108				08:15	111	190				
08:30		201	71				08:30	109	161				
08:45		223	77	937	359		08:45	107	161	434	702	1371	1061
09:00		212	65				09:00	88	157				
09:15		227	47				09:15	133	176				
09:30		227	60				09:30	83	137				
09:45		216	45	882	217		09:45	125	116	429	586	1311	803
10:00		215	38				10:00	111	133				
10:15		183	25				10:15	116	120				
10:30		227	27				10:30	109	131				
10:45		201	17	826	107		10:45	131	94	467	478	1293	585
11:00		191	26				11:00	123	85				
11:15		234	16				11:15	131	72				
11:30		174	12				11:30	144	62				
11:45		181	11	780	65		11:45	140	40	538	259	1318	324
Total		5767	6023				Total	2978	6378			8745	12401
Percent		48.9%	51.1%				Percent	31.8%	68.2%			41.4%	58.6%

	01-Oct-13	Northbound		Hour Totals			01-Oct-13	Southbound		Hour Totals		Combined Totals	
	Tue	Morning	Afternoon	Morning	Afternoon		Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		12	160				12:00	44	160				
12:15		20	181				12:15	35	175				
12:30		7	197				12:30	29	144				
12:45		9	186	48	724		12:45	25	157	133	636	181	1360
01:00		7	184				01:00	18	157				
01:15		1	187				01:15	12	184				
01:30		2	161				01:30	12	158				
01:45		3	157	13	689		01:45	18	193	60	692	73	1381
02:00		4	152				02:00	18	177				
02:15		10	195				02:15	15	171				
02:30		5	171				02:30	24	177				
02:45		5	166	24	684		02:45	6	204	63	729	87	1413
03:00		1	204				03:00	10	193				
03:15		7	150				03:15	8	174				
03:30		7	179				03:30	14	158				
03:45		9	230	24	763		03:45	10	158	42	683	66	1446
04:00		5	200				04:00	18	170				
04:15		10	188				04:15	8	160				
04:30		25	205				04:30	6	134				
04:45		32	194	72	787		04:45	4	90	36	554	108	1341
05:00		31	200				05:00	15	112				
05:15		60	235				05:15	25	100				
05:30		72	187				05:30	29	86				
05:45		96	188	259	810		05:45	46	109	115	407	374	1217
06:00		123	160				06:00	60	104				
06:15		231	161				06:15	86	149				
06:30		305	182				06:30	82	104				
06:45		307	158	966	661		06:45	105	181	333	538	1299	1199
07:00		281	160				07:00	128	321				
07:15		258	151				07:15	143	289				
07:30		289	149				07:30	148	272				
07:45		302	132	1130	592		07:45	123	258	542	1140	1672	1732
08:00		274	112				08:00	126	258				
08:15		281	117				08:15	132	214				
08:30		218	77				08:30	117	144				
08:45		241	83	1014	389		08:45	119	139	494	755	1508	1144
09:00		230	70				09:00	107	136				
09:15		246	51				09:15	107	126				
09:30		246	65				09:30	115	110				
09:45		234	49	956	235		09:45	123	104	452	476	1408	711
10:00		233	41				10:00	123	84				
10:15		198	27				10:15	167	70				
10:30		246	29				10:30	151	57				
10:45		218	18	895	115		10:45	146	50	587	261	1482	376
11:00		207	28				11:00	148	44				
11:15		253	17				11:15	125	43				
11:30		188	13				11:30	129	26				
11:45		196	12	844	70		11:45	148	25	550	138	1394	208
Total		6245	6519				Total	3407	7009			9652	13528
Percent		48.9%	51.1%				Percent	32.7%	67.3%			41.6%	58.4%

	02-Oct-13 Wed	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		02-Oct-13 Wed	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		18	179				12:00	42	175				
12:15		19	182				12:15	22	153				
12:30		3	165				12:30	29	163				
12:45		7	219	47	745		12:45	22	150	115	641	162	1386
01:00		7	173				01:00	10	153				
01:15		7	194				01:15	24	168				
01:30		1	174				01:30	17	163				
01:45		2	178	17	719		01:45	6	179	57	663	74	1382
02:00		3	140				02:00	12	185				
02:15		2	175				02:15	10	169				
02:30		2	178				02:30	12	165				
02:45		4	218	11	711		02:45	10	181	44	700	55	1411
03:00		7	186				03:00	10	148				
03:15		6	158				03:15	10	181				
03:30		7	165				03:30	4	189				
03:45		6	208	26	717		03:45	6	171	30	689	56	1406
04:00		6	185				04:00	6	177				
04:15		12	183				04:15	0	163				
04:30		26	167				04:30	6	93				
04:45		35	195	79	730		04:45	15	98	27	531	106	1261
05:00		38	201				05:00	20	168				
05:15		60	200				05:15	32	105				
05:30		88	201				05:30	20	85				
05:45		106	207	292	809		05:45	40	86	112	444	404	1253
06:00		157	189				06:00	60	93				
06:15		262	204				06:15	86	189				
06:30		312	201				06:30	66	138				
06:45		286	177	1017	771		06:45	109	167	321	587	1338	1358
07:00		259	158				07:00	121	193				
07:15		298	154				07:15	103	197				
07:30		255	113				07:30	125	197				
07:45		286	124	1098	549		07:45	136	173	485	760	1583	1309
08:00		273	130				08:00	136	205				
08:15		299	97				08:15	117	197				
08:30		256	86				08:30	143	187				
08:45		257	76	1085	389		08:45	93	179	489	768	1574	1157
09:00		248	62				09:00	115	178				
09:15		244	72				09:15	107	161				
09:30		269	61				09:30	110	144				
09:45		224	42	985	237		09:45	130	136	462	619	1447	856
10:00		192	35				10:00	143	113				
10:15		208	27				10:15	121	85				
10:30		224	25				10:30	125	98				
10:45		198	20	822	107		10:45	121	90	510	386	1332	493
11:00		206	20				11:00	115	63				
11:15		178	12				11:15	132	50				
11:30		210	15				11:30	117	48				
11:45		189	15	783	62		11:45	136	43	500	204	1283	266
Total		6262	6546				Total	3152	6992			9414	13538
Percent		48.9%	51.1%				Percent	31.1%	68.9%			41.0%	59.0%

	03-Oct-13 Thu	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		03-Oct-13 Thu	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		8	198				12:00	43	156				
12:15		6	183				12:15	30	146				
12:30		7	193				12:30	42	125				
12:45		6	186	27	760		12:45	25	163	140	590	167	1350
01:00		5	192				01:00	17	146				
01:15		7	155				01:15	14	155				
01:30		3	201				01:30	10	185				
01:45		5	158	20	706		01:45	24	193	65	679	85	1385
02:00		4	166				02:00	14	165				
02:15		3	153				02:15	12	168				
02:30		6	171				02:30	8	151				
02:45		2	184	15	674		02:45	5	158	39	642	54	1316
03:00		3	193				03:00	10	115				
03:15		3	149				03:15	10	161				
03:30		7	211				03:30	8	151				
03:45		7	190	20	743		03:45	12	179	40	606	60	1349
04:00		9	182				04:00	5	141				
04:15		18	202				04:15	5	155				
04:30		17	202				04:30	6	88				
04:45		35	234	79	820		04:45	5	68	21	452	100	1272
05:00		37	200				05:00	18	72				
05:15		54	214				05:15	20	83				
05:30		79	179				05:30	27	78				
05:45		125	220	295	813		05:45	35	76	100	309	395	1122
06:00		147	182				06:00	42	113				
06:15		232	179				06:15	66	105				
06:30		327	198				06:30	73	195				
06:45		289	177	995	736		06:45	98	141	279	554	1274	1290
07:00		288	182				07:00	97	190				
07:15		283	153				07:15	119	167				
07:30		288	142				07:30	134	179				
07:45		281	130	1140	607		07:45	121	158	471	694	1611	1301
08:00		301	128				08:00	111	198				
08:15		262	87				08:15	115	198				
08:30		264	89				08:30	113	168				
08:45		246	92	1073	396		08:45	111	167	450	731	1523	1127
09:00		249	70				09:00	92	163				
09:15		250	55				09:15	138	183				
09:30		226	46				09:30	86	143				
09:45		208	58	933	229		09:45	130	121	446	610	1379	839
10:00		219	70				10:00	115	138				
10:15		205	47				10:15	121	125				
10:30		218	39				10:30	113	136				
10:45		190	31	832	187		10:45	136	98	485	497	1317	684
11:00		177	32				11:00	128	88				
11:15		190	20				11:15	136	75				
11:30		200	13				11:30	150	64				
11:45		188	8	755	73		11:45	146	42	560	269	1315	342
Total		6184	6744				Total	3096	6633			9280	13377
Percent		47.8%	52.2%				Percent	31.8%	68.2%			41.0%	59.0%

	04-Oct-13 Fri	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		04-Oct-13 Fri	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		8	210				12:00	46	170				
12:15		6	194				12:15	37	186				
12:30		7	204				12:30	31	153				
12:45		6	197	27	805		12:45	27	167	141	676	168	1481
01:00		5	203				01:00	20	167				
01:15		7	164				01:15	12	196				
01:30		3	213				01:30	12	168				
01:45		5	167	20	747		01:45	20	205	64	736	84	1483
02:00		4	176				02:00	20	188				
02:15		3	162				02:15	15	182				
02:30		6	181				02:30	26	188				
02:45		2	195	15	714		02:45	6	217	67	775	82	1489
03:00		3	204				03:00	10	205				
03:15		3	158				03:15	8	185				
03:30		7	223				03:30	14	168				
03:45		7	201	20	786		03:45	10	168	42	726	62	1512
04:00		10	193				04:00	20	181				
04:15		19	214				04:15	8	170				
04:30		18	214				04:30	6	142				
04:45		37	248	84	869		04:45	4	96	38	589	122	1458
05:00		39	212				05:00	15	119				
05:15		57	227				05:15	27	106				
05:30		84	189				05:30	31	92				
05:45		132	233	312	861		05:45	48	116	121	433	433	1294
06:00		156	193				06:00	64	110				
06:15		246	189				06:15	92	159				
06:30		346	210				06:30	88	110				
06:45		306	187	1054	779		06:45	111	193	355	572	1409	1351
07:00		305	193				07:00	136	341				
07:15		300	162				07:15	152	307				
07:30		305	150				07:30	158	289				
07:45		297	138	1207	643		07:45	131	274	577	1211	1784	1854
08:00		319	135				08:00	134	274				
08:15		277	92				08:15	140	228				
08:30		279	94				08:30	125	153				
08:45		260	97	1135	418		08:45	127	148	526	803	1661	1221
09:00		264	74				09:00	113	144				
09:15		265	58				09:15	113	134				
09:30		239	49				09:30	123	117				
09:45		220	61	988	242		09:45	131	110	480	505	1468	747
10:00		232	74				10:00	131	90				
10:15		217	50				10:15	177	74				
10:30		231	41				10:30	161	61				
10:45		201	33	881	198		10:45	156	54	625	279	1506	477
11:00		187	34				11:00	158	46				
11:15		201	21				11:15	133	45				
11:30		212	14				11:30	137	28				
11:45		199	8	799	77		11:45	158	27	586	146	1385	223
Total		6542	7139				Total	3622	7451			10164	14590
Percent		47.8%	52.2%				Percent	32.7%	67.3%			41.1%	58.9%
Grand Total		31000	32971				Grand Total	16255	34463			47255	67434
Percent		48.5%	51.5%				Percent	32.0%	68.0%			41.2%	58.8%

	30-Sep-13 Mon	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		30-Sep-13 Mon	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		0	102				12:00	8	145				
12:15		3	129				12:15	13	151				
12:30		9	117				12:30	8	162				
12:45		0	120	12	468		12:45	8	148	37	606	49	1074
01:00		9	125				01:00	16	155				
01:15		0	94				01:15	3	128				
01:30		8	102				01:30	8	135				
01:45		8	120	25	441		01:45	9	177	36	595	61	1036
02:00		12	96				02:00	3	182				
02:15		9	118				02:15	8	177				
02:30		8	114				02:30	0	193				
02:45		20	165	49	493		02:45	3	190	14	742	63	1235
03:00		26	111				03:00	13	199				
03:15		32	102				03:15	8	176				
03:30		54	139				03:30	21	199				
03:45		80	118	192	470		03:45	29	213	71	787	263	1257
04:00		90	141				04:00	16	206				
04:15		163	94				04:15	26	193				
04:30		280	90				04:30	46	196				
04:45		315	122	848	447		04:45	59	176	147	771	995	1218
05:00		235	118				05:00	82	193				
05:15		165	72				05:15	94	140				
05:30		174	90				05:30	121	153				
05:45		163	88	737	368		05:45	155	140	452	626	1189	994
06:00		168	84				06:00	117	135				
06:15		136	60				06:15	121	135				
06:30		166	60				06:30	122	108				
06:45		171	56	641	260		06:45	102	100	462	478	1103	738
07:00		165	49				07:00	94	63				
07:15		171	47				07:15	89	96				
07:30		139	57				07:30	74	78				
07:45		153	49	628	202		07:45	59	57	316	294	944	496
08:00		136	30				08:00	80	64				
08:15		153	30				08:15	98	69				
08:30		131	22				08:30	88	48				
08:45		141	14	561	96		08:45	89	52	355	233	916	329
09:00		117	17				09:00	72	29				
09:15		122	15				09:15	93	24				
09:30		127	9				09:30	100	28				
09:45		111	15	477	56		09:45	121	28	386	109	863	165
10:00		129	12				10:00	108	15				
10:15		120	14				10:15	78	8				
10:30		97	9				10:30	100	15				
10:45		111	8	457	43		10:45	108	9	394	47	851	90
11:00		124	12				11:00	125	9				
11:15		136	2				11:15	121	13				
11:30		117	8				11:30	115	11				
11:45		120	3	497	25		11:45	140	5	501	38	998	63
Total		5124	3369				Total	3171	5326			8295	8695
Percent		60.3%	39.7%				Percent	37.3%	62.7%			48.8%	51.2%

	01-Oct-13	Northbound		Hour Totals			01-Oct-13	Southbound		Hour Totals		Combined Totals	
	Tue	Morning	Afternoon	Morning	Afternoon		Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	111				12:00	2	148				
12:15		8	129				12:15	5	150				
12:30		5	117				12:30	8	159				
12:45		0	108	15	465		12:45	2	159	17	616	32	1081
01:00		5	133				01:00	0	165				
01:15		9	109				01:15	0	179				
01:30		5	148				01:30	0	115				
01:45		5	146	24	536		01:45	8	163	8	622	32	1158
02:00		0	90				02:00	5	159				
02:15		2	117				02:15	8	193				
02:30		15	108				02:30	2	206				
02:45		17	125	34	440		02:45	8	226	23	784	57	1224
03:00		12	120				03:00	5	222				
03:15		35	122				03:15	5	242				
03:30		40	118				03:30	13	204				
03:45		87	102	174	462		03:45	26	215	49	883	223	1345
04:00		75	108				04:00	26	224				
04:15		139	102				04:15	18	207				
04:30		261	96				04:30	60	226				
04:45		287	96	762	402		04:45	59	198	163	855	925	1257
05:00		194	99				05:00	88	172				
05:15		193	132				05:15	85	167				
05:30		181	92				05:30	103	153				
05:45		174	148	742	471		05:45	108	103	384	595	1126	1066
06:00		168	92				06:00	130	126				
06:15		163	62				06:15	114	102				
06:30		174	64				06:30	108	128				
06:45		153	67	658	285		06:45	74	94	426	450	1084	735
07:00		159	62				07:00	105	89				
07:15		161	50				07:15	102	77				
07:30		186	47				07:30	69	77				
07:45		161	27	667	186		07:45	80	64	356	307	1023	493
08:00		141	40				08:00	72	66				
08:15		149	30				08:15	78	40				
08:30		127	27				08:30	105	40				
08:45		118	15	535	112		08:45	85	29	340	175	875	287
09:00		158	19				09:00	85	16				
09:15		144	17				09:15	98	28				
09:30		122	17				09:30	93	35				
09:45		109	3	533	56		09:45	90	15	366	94	899	150
10:00		94	11				10:00	125	20				
10:15		127	17				10:15	94	15				
10:30		102	8				10:30	98	8				
10:45		108	3	431	39		10:45	125	9	442	52	873	91
11:00		94	8				11:00	130	3				
11:15		114	5				11:15	125	0				
11:30		109	2				11:30	135	15				
11:45		118	2	435	17		11:45	151	5	541	23	976	40
Total		5010	3471				Total	3115	5456			8125	8927
Percent		59.1%	40.9%				Percent	36.3%	63.7%			47.6%	52.4%

	02-Oct-13 Wed	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		02-Oct-13 Wed	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		3	125			12:00		2	122				
12:15		3	108			12:15		0	158				
12:30		0	136			12:30		3	155				
12:45		8	158	14	527	12:45		0	155	5	590	19	1117
01:00		9	120			01:00		2	145				
01:15		3	114			01:15		8	185				
01:30		8	117			01:30		2	158				
01:45		3	111	23	462	01:45		3	169	15	657	38	1119
02:00		8	113			02:00		3	148				
02:15		2	104			02:15		3	170				
02:30		9	139			02:30		2	199				
02:45		24	111	43	467	02:45		3	211	11	728	54	1195
03:00		24	120			03:00		3	219				
03:15		30	107			03:15		8	231				
03:30		50	156			03:30		21	211				
03:45		97	114	201	497	03:45		32	199	64	860	265	1357
04:00		102	104			04:00		24	217				
04:15		191	131			04:15		24	182				
04:30		283	109			04:30		59	207				
04:45		337	109	913	453	04:45		63	207	170	813	1083	1266
05:00		231	104			05:00		66	165				
05:15		171	108			05:15		103	172				
05:30		166	90			05:30		128	140				
05:45		158	62	726	364	05:45		125	133	422	610	1148	974
06:00		146	124			06:00		137	122				
06:15		141	111			06:15		130	128				
06:30		168	99			06:30		90	122				
06:45		165	69	620	403	06:45		85	130	442	502	1062	905
07:00		153	43			07:00		93	84				
07:15		177	52			07:15		72	110				
07:30		168	66			07:30		96	82				
07:45		129	32	627	193	07:45		66	57	327	333	954	526
08:00		136	22			08:00		98	66				
08:15		129	20			08:15		93	35				
08:30		133	9			08:30		69	43				
08:45		141	12	539	63	08:45		84	35	344	179	883	242
09:00		141	20			09:00		102	29				
09:15		132	20			09:15		98	29				
09:30		144	12			09:30		90	20				
09:45		136	9	553	61	09:45		105	15	395	93	948	154
10:00		113	15			10:00		103	16				
10:15		99	11			10:15		94	13				
10:30		102	3			10:30		78	5				
10:45		136	9	450	38	10:45		108	11	383	45	833	83
11:00		114	9			11:00		108	9				
11:15		120	8			11:15		148	2				
11:30		120	9			11:30		105	3				
11:45		117	8	471	34	11:45		145	2	506	16	977	50
Total		5180	3562			Total		3084	5426			8264	8988
Percent		59.3%	40.7%			Percent		36.2%	63.8%			47.9%	52.1%

	03-Oct-13 Thu	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		03-Oct-13 Thu	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		0	107				12:00	3	148				
12:15		2	132				12:15	8	155				
12:30		5	120				12:30	3	165				
12:45		0	124	7	483		12:45	3	151	17	619	24	1102
01:00		5	129				01:00	9	159				
01:15		0	96				01:15	2	132				
01:30		3	107				01:30	3	139				
01:45		3	124	11	456		01:45	5	182	19	612	30	1068
02:00		8	97				02:00	2	187				
02:15		5	122				02:15	3	182				
02:30		8	118				02:30	0	198				
02:45		20	168	41	505		02:45	3	194	8	761	49	1266
03:00		26	114				03:00	13	207				
03:15		32	104				03:15	8	179				
03:30		56	142				03:30	21	207				
03:45		83	122	197	482		03:45	29	220	71	813	268	1295
04:00		92	144				04:00	16	213				
04:15		166	97				04:15	26	199				
04:30		287	94				04:30	48	204				
04:45		323	125	868	460		04:45	60	179	150	795	1018	1255
05:00		241	122				05:00	84	198				
05:15		168	75				05:15	96	145				
05:30		179	94				05:30	125	158				
05:45		166	92	754	383		05:45	159	145	464	646	1218	1029
06:00		174	87				06:00	121	139				
06:15		141	60				06:15	125	139				
06:30		171	64				06:30	126	114				
06:45		176	56	662	267		06:45	103	103	475	495	1137	762
07:00		168	49				07:00	96	63				
07:15		177	47				07:15	90	100				
07:30		142	57				07:30	77	82				
07:45		156	49	643	202		07:45	60	57	323	302	966	504
08:00		141	30				08:00	82	66				
08:15		156	30				08:15	100	72				
08:30		133	22				08:30	89	48				
08:45		144	14	574	96		08:45	90	52	361	238	935	334
09:00		120	17				09:00	74	29				
09:15		125	15				09:15	94	24				
09:30		131	9				09:30	102	28				
09:45		114	15	490	56		09:45	125	28	395	109	885	165
10:00		132	11				10:00	110	15				
10:15		124	14				10:15	80	8				
10:30		99	8				10:30	102	16				
10:45		114	8	469	41		10:45	114	2	406	41	875	82
11:00		127	12				11:00	128	9				
11:15		139	2				11:15	125	13				
11:30		120	2				11:30	119	2				
11:45		124	3	510	19		11:45	145	3	517	27	1027	46
Total		5226	3450				Total	3206	5458			8432	8908
Percent		60.2%	39.8%				Percent	37.0%	63.0%			48.6%	51.4%

	04-Oct-13 Fri	Northbound Morning	Afternoon	Hour Totals Morning	Afternoon		04-Oct-13 Fri	Southbound Morning	Afternoon	Hour Totals Morning	Afternoon	Combined Totals Morning	Afternoon
12:00		8	136				12:00	3	133				
12:15		8	117				12:15	0	169				
12:30		0	146				12:30	8	167				
12:45		15	171	31	570		12:45	0	167	11	636	42	1206
01:00		19	129				01:00	3	158				
01:15		8	124				01:15	16	198				
01:30		15	125				01:30	3	169				
01:45		8	120	50	498		01:45	8	182	30	707	80	1205
02:00		15	122				02:00	8	159				
02:15		3	111				02:15	8	182				
02:30		19	149				02:30	3	215				
02:45		26	120	63	502		02:45	3	227	22	783	85	1285
03:00		26	129				03:00	3	235				
03:15		32	114				03:15	8	248				
03:30		54	168				03:30	24	227				
03:45		107	124	219	535		03:45	34	215	69	925	288	1460
04:00		109	111				04:00	26	233				
04:15		206	141				04:15	26	196				
04:30		307	118				04:30	64	222				
04:45		367	118	989	488		04:45	69	222	185	873	1174	1361
05:00		251	111				05:00	72	177				
05:15		186	117				05:15	114	185				
05:30		181	97				05:30	139	151				
05:45		171	67	789	392		05:45	135	142	460	655	1249	1047
06:00		158	132				06:00	148	132				
06:15		153	120				06:15	140	137				
06:30		182	107				06:30	98	132				
06:45		179	75	672	434		06:45	93	139	479	540	1151	974
07:00		166	47				07:00	100	89				
07:15		193	56				07:15	78	119				
07:30		182	72				07:30	103	88				
07:45		139	33	680	208		07:45	72	60	353	356	1033	564
08:00		148	24				08:00	108	72				
08:15		139	37				08:15	100	64				
08:30		146	15				08:30	74	80				
08:45		153	22	586	98		08:45	90	64	372	280	958	378
09:00		153	37				09:00	110	55				
09:15		144	37				09:15	108	55				
09:30		156	22				09:30	98	37				
09:45		148	15	601	111		09:45	115	28	431	175	1032	286
10:00		124	30				10:00	114	32				
10:15		108	19				10:15	102	24				
10:30		111	8				10:30	85	11				
10:45		148	15	491	72		10:45	117	20	418	87	909	159
11:00		125	15				11:00	119	16				
11:15		131	12				11:15	162	3				
11:30		131	15				11:30	115	8				
11:45		127	12	514	54		11:45	158	3	554	30	1068	84
Total		5685	3962				Total	3384	6047			9069	10009
Percent		58.9%	41.1%				Percent	35.9%	64.1%			47.5%	52.5%
Grand Total		26225	17814				Grand Total	15960	27713			42185	45527
Percent		59.5%	40.5%				Percent	36.5%	63.5%			48.1%	51.9%

GEOLOGIC ASSESSMENT OF THE STATE HIGHWAY 45 SOUTHWEST RIGHT OF WAY FROM STATE LOOP 1 (MOPAC) TO FARM-TO-MARKET 1626, TEXAS DEPARTMENT OF TRANSPORTATION RIGHT OF WAY, TRAVIS AND HAYS COUNTIES, TEXAS

CSJs 1200-06-004 and 1200-07-001

Prepared for

TEXAS DEPARTMENT OF TRANSPORTATION

Prepared by

SWCA ENVIRONMENTAL CONSULTANTS
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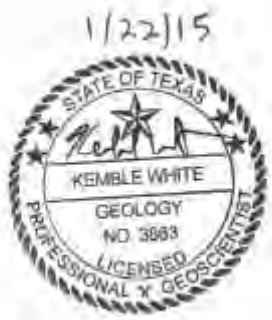
SWCA Project Number 27070.02
January 2015



As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

Kemble White Ph.D., P.G.
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Texas Geoscience Firm Registration Number 50484
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SECTION 1.0

FORM TCEQ-0585

Geologic Assessment
For Regulated Activities
on The Edwards Aquifer Recharge/transition Zones
and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

REGULATED ENTITY NAME: State Highway 45 Southwest

TYPE OF PROJECT: _X_ WPAP __ AST __ SCS __ UST

LOCATION OF PROJECT: _X_ Recharge Zone _X_ Transition Zone __ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. _X_ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE**.

2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Crawford (CrB)	D	< 3
Denton (DeC3)	D	< 4
Eckrant (ErG)	D	< 2
Heiden (Heb, HeC2, HeC3)	D	> 5
Medlin-Eckrant (MED)	D	> 5
Mixed Alluvial Land (Md)	A	< 4
Rumple-Comfort Complex (RuD)	C	< 4
Speck (SsC, SpB)	D	< 1.5
Tarpley (TaB)	D	< 2
Tarrant (TaD)	D	< 3

* Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

3. _X_ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. _X_ A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of

the site.

5. _X_ Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale	1" = _200_ '
Site Geologic Map Scale	1" = _200_ '
Site Soils Map Scale (if more than 1 soil type)	1" = _3000_ '

6. Method of collecting positional data:
   _X_ Global Positioning System (GPS) technology.
   _X_ Other method(s) (features outside ROW boundary were surveyed in using standard civil survey methods).

7. _X_ The project site is shown and labeled on the Site Geologic Map.

8. _X_ Surface geologic units are shown and labeled on the Site Geologic Map.

9. _X_ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
   ___ Geologic or manmade features were not discovered on the project site during the field investigation.

10. _X_ The Recharge Zone boundary is shown and labeled, if appropriate.

11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):

   ___ There are ___(#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
      ___ The wells are not in use and have been properly abandoned.
      ___ The wells are not in use and will be properly abandoned.
      ___ The wells are in use and comply with 16 TAC Chapter 76.
   _X_ There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

12. _X_ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

Date(s) Geologic Assessment was performed: from December 2013 to June 2014
Date(s)

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Kemble White Ph.D., P.G. 512.663.0156
Print Name of Geologist Telephone

Signature of Geologist

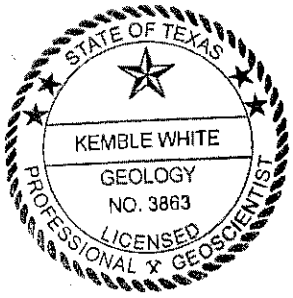
Fax

1/22/15
Date

Representing: Cambrian Environmental (TBPG Firm Registration #50484)
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.



SECTION 2.0

GEOLOGIC ASSESSMENT NARRATIVE

EXECUTIVE SUMMARY

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (CTRMA) are currently planning to extend a current segment of SH 45 from the southern terminus of State Loop 1 (MoPac) to Farm-to-Market Road 1626 (FM 1626) through Travis and Hays Counties. The project would cross the recharge zone of the Barton Springs Segment of the Edwards Aquifer (BSS/EA). The purpose of this study was to identify all karst features within the proposed SH 45 SW right of way with the potential to provide rapid recharge to the aquifer. This report provides descriptions of all potential karst features identified, an assessment of the significance of the karst features found and characterizes the potential for the current State Highway 45 southwest roadway alignment to effect the continued hydrologic function of those features.

Two licensed professional geoscientists (License numbers 3863 and 10791), and a team of karst technicians conducted field surveys of the ROW between December of 2013 and August of 2014. They were assisted by a TxDOT professional geoscientist (License number 1350). More than 200 potential karst features (primarily small depressions in the landscape) were carefully examined for evidence of subsurface extent such as sinkhole development. All potential features identified were then subjected to further investigation including hand excavation and, where needed, excavation with mechanical aids such as jackhammers, backhoe and hoe ram in order to determine their origin and potential hydrologic significance. As a result of excavation approximately 90 percent of the features investigated were determined to be non-sensitive and non-karst in origin. These included stump holes, animal burrows, and man-made excavation scars associated with ranching activities.

Twenty-seven features were determined to be of karst origin. Of these, seventeen features were determined to be sensitive with the potential for rapid recharge according to TCEQ criteria. The remaining ten karst features were determined to be non-sensitive primarily due to the presence of significant thickness of terra rossa clay infill (as much as 10 feet). The most significant of the sensitive karst features includes Cow Pattie Cave (F-18), Hat Sink (F-23), two adjacent un-named caves (F64 and F-65), Jubilee Cave (F-110), SH 45 Cave (F-157a and b), and MoPac Sink (F-170).

In addition to the features referred to above, two cave radio monuments were located within the ROW representing the approximate locations of the terminal rooms within Flint Ridge Cave. Although the entrance of Flint Ridge Cave is located approximately 150 feet east of the right of way, the southern end of the cave occurs beneath the right of way at depths generally between 120 and 150 feet below the surface (See attached cave maps). The right of way includes a portion of the surface drainage basin for Flint Ridge Cave which has one of the largest surface drainage basins of an upland recharge feature known from the Edwards Aquifer recharge zone.

Our interpretation of site hydrogeology plays upon the factors that allowed Flint Ridge Cave to develop such an anomalously large surface drainage basin. An aerially extensive deposit of terra rossa clay (and the Speck soil series derived from it) generally blankets the northern three quarters of the project area. The results of excavation work described above as well as soil studies conducted in 2005 indicate that generally between one and four feet of clay soil are present. This condition causes runoff and evapotranspiration to predominate over recharge throughout most of the project area. Were this not the case the surface drainage basins of other recharge features would have prevented the drainage basin of Flint Ridge Cave from reaching its current size.

Although several sensitive upland recharge features have been identified during this study, by far the most significant recharge features in the project area are Flint Ridge Cave and the bed of Bear Creek.

INTRODUCTION

SWCA Environmental Consultants (SWCA) and Cambrian Environmental (Cambrian) were contracted by the Texas Department of Transportation (TxDOT) to perform a geologic assessment investigation including a karst terrain feature survey within the right of way (ROW) of the proposed State Highway 45 Southwest (SH 45 SW) Project, hereafter referred to as the "project." The project would extend a current segment of SH 45 from the southern terminus of State Loop 1 (MoPac) to Farm-to-Market Road 1626 (FM 1626) through Travis and Hays Counties. The project would also include improvements to adjacent segments of the above-mentioned roadways and to Bliss Spillar Road and Old Bliss Spillar Road at intersections (See figures 1 and 2). The length of this extension is about 3.5 miles. The proposed project consists of construction of a four-lane roadway within state-owned ROW that is generally 425 to 575 feet wide and totaling approximately 309 acres. All but the southeastern tip of the SH 45 SW ROW (approximately 277.4 acres) lies within the recharge zone for the Barton Springs Segment of the Edwards Aquifer (BSS/EA). Approximately 31.7 acres is located within the aquifer transition zone. Much of the adjacent land is owned and managed by the City of Austin as water quality protection lands.

The purpose of this study was to identify all karst features within the proposed SH 45 SW alignment that exhibit surface expression, have the potential to lead to significant subsurface void space, and have the potential to recharge the main body of the BSS/EA. This report provides an assessment of the significance of all investigated features and characterizes the significance of the ROW to BSS/EA hydrogeology.

METHODS

Prior to initiating field surveys, we reviewed available geologic maps, aerial imagery, and previous karst studies of the project area (See list of references). Of particular interest were karst investigations conducted on behalf of TxDOT for the SH 45 right of way, and on behalf of the Lower Colorado River Authority for the power lines that parallel and cross the right of way. Two licensed professional geoscientists (Texas License numbers 3863 and 10791) and four karst technicians conducted a pedestrian survey of the right of way between December 2013 and June 2014. Field assistance was also provided by a TxDOT professional geoscientist (Texas License number 1350). The pedestrian survey was completed by walking parallel transects spaced approximately 25 to 50 feet apart in a manner consistent with guidance provided by the Texas Commission on Environmental Quality (TCEQ) in the Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (TCEQ 2004). Closer spacing was used where vegetation inhibited clear observation. The feature locations were recorded using a Global Positioning System (GPS) receiver. Features located near the ROW boundary were surveyed in by TxDOT staff using standard civil survey methods.

All potential karst features, including depressions, holes, and animal burrows, were carefully examined for evidence of subsurface extent. A number of techniques were used for this effort, including probing with a digging implement to determine the thickness and consistency of fill material and feeling for the presence of air flow, which may indicate the presence of a sub-surface void space. Other techniques included making observations of any notable characteristics of the feature site such as the presence of various types of vegetation or a semi-circular burrow mound produced by the activities of small mammals. Following initial investigation features were excavated to the bedrock surface in order to determine if they were of karst origin. In some cases excavation required the use of heavy equipment including jackhammers, and a backhoe and a hoe ram provided by TxDOT and guided by the professional geoscientists conducting the study. Authorization for excavation activities was coordinated both through the TCEQ Edward Aquifer Protection Program and through the General Land Office under the Texas Cavern Protection Act. Relative to previous studies, these methods allow for a much higher confidence level in assessing the sensitivity of investigated features.

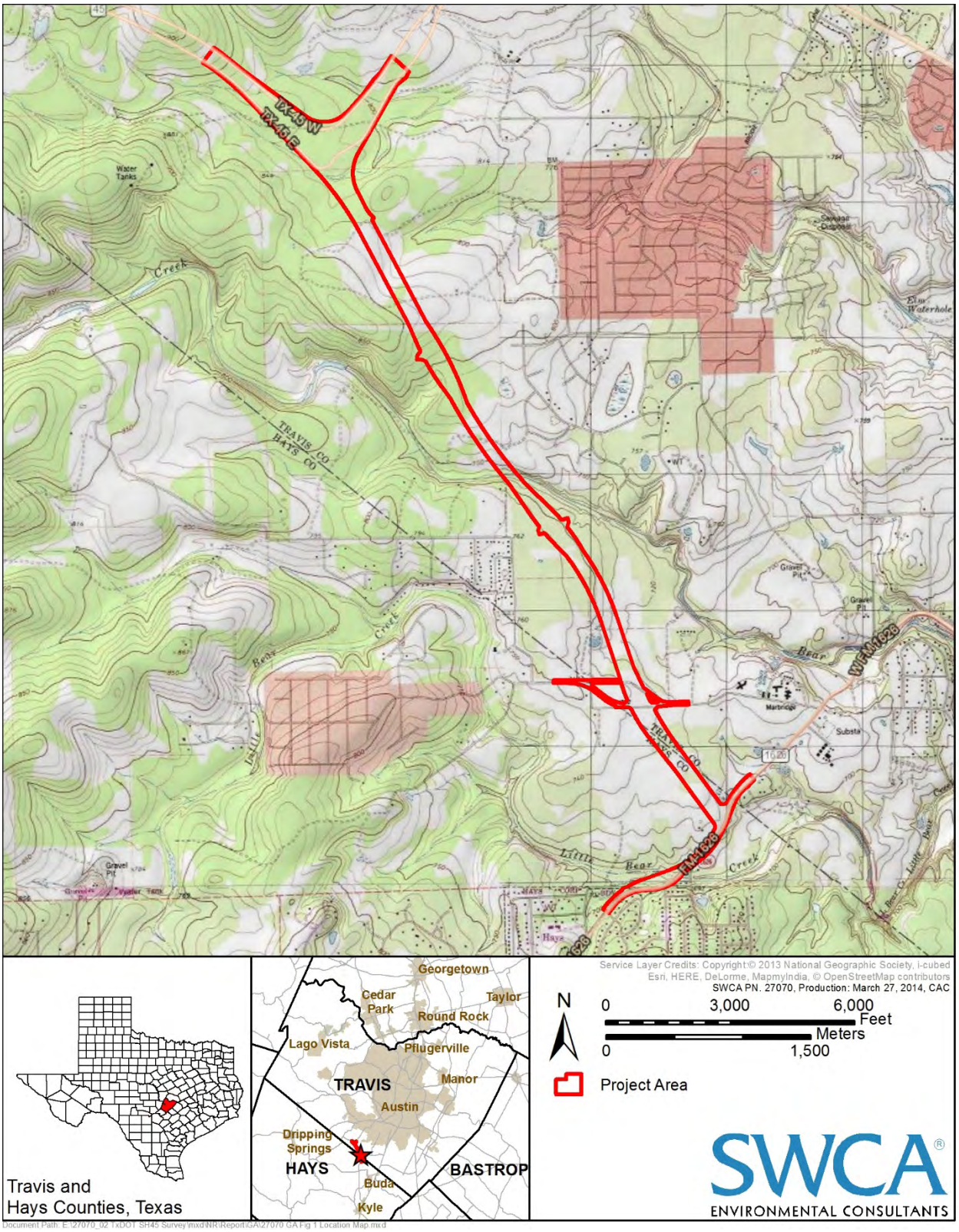


Figure 1. Project location map and topography.

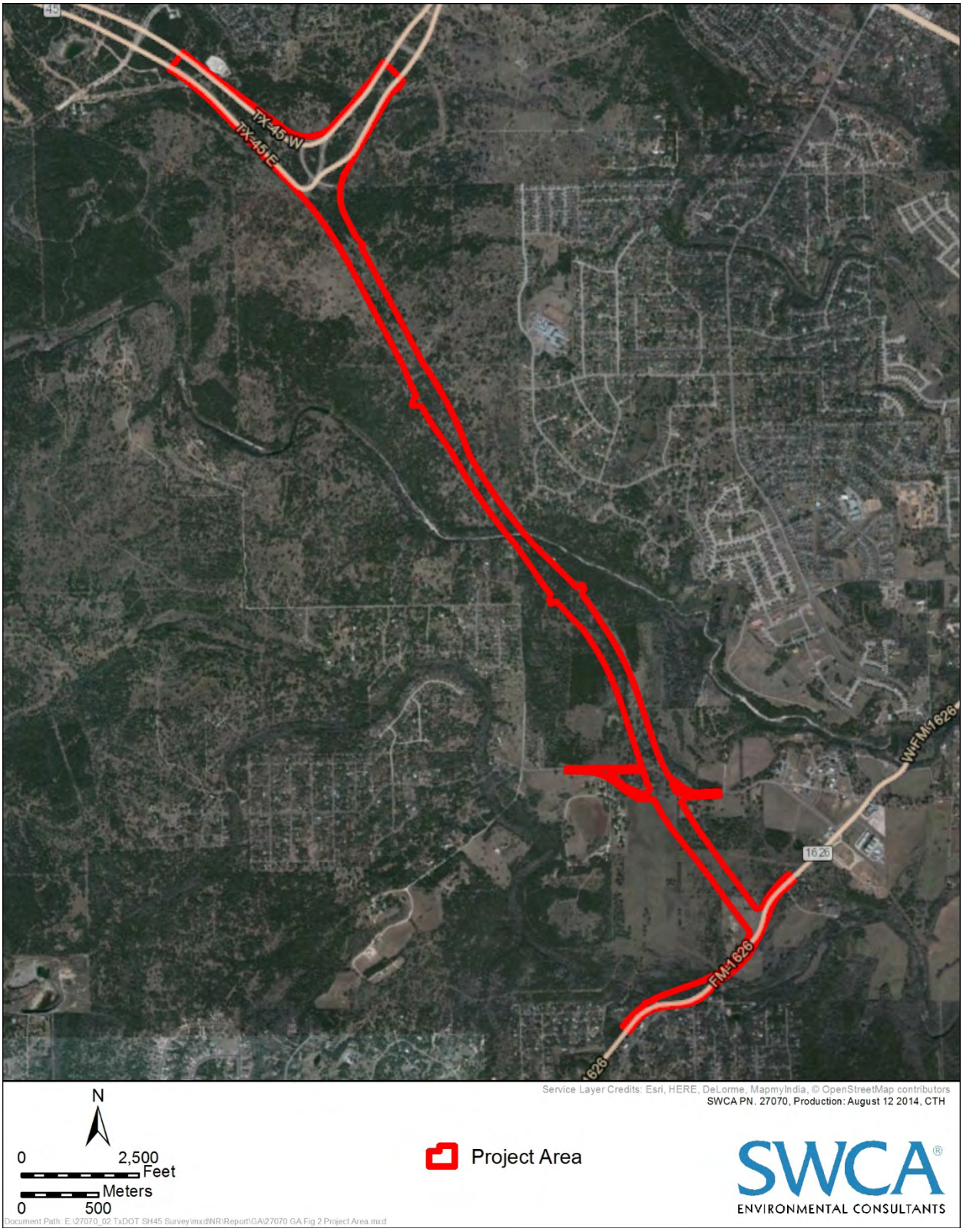


Figure 2. Project area.

As much as feasible, we correlated potential karst feature locations with features identified in previous surveys using GPS coordinates, comparison with photo documentation, and observations of remnants of flagging tape and wooden marker hubs found during the field investigation (aci consulting 2007). Where features could be correlated to features identified in previous karst surveys, the applicable feature identification number is included in the following feature descriptions.

Concurrent with the geologic assessment investigation TxDOT also conducted a geophysical investigation of the right of way (Environmental Geophysics Associates 2014, Weissling 2014; Section 6.0). This investigation included extensive electrical resistivity imaging surveys and natural potential surveys to characterize subsurface conditions. The results of these surveys were used in the geologic assessment in three ways. First they were used to provide additional context for specific karst features with surface expression. Specifically, 3D resistivity imaging was conducted at the major karst features. Second, geophysical results were used in developing the overall interpretation of site hydrogeology. The terra rossa clay layer described above was persistent throughout many of the resistivity images which aided in dividing the project area into zones of greater or lesser sensitivity with respect to recharge. Third, the geophysical results aided in interpreting the pattern of faulting in the project area and the likely sensitivity of faults present. Multiple geologic maps of the area disagree as to the locations of major faults. Geophysical results aided in narrowing the locations of these features as well as detecting smaller scale probable faults that do not occur on published geologic maps.

In addition to various published geologic maps of the project area ArcGIS files of the most current City of Austin geologic map of the Austin area (City of Austin 2014) were obtained. They were used in field maps to aid in site-specific geological interpretation.

SITE DESCRIPTION, HYDROGEOLOGY, AND SOILS

Topography within the project area consists primarily of gently rolling uplands dissected by shallow drainages. Elevation within the project area ranges from approximately 850 feet above mean sea level (amsl) near the northern end of the project area, down to approximately 702 feet amsl near the southern end. Surface water runoff in the northern portion of the project area drains east toward a tributaries of Slaughter Creek. The central portion of the project area drains into Bear Creek which crosses through the right of way. The southern end of the project including the segment along FM 1626 drains to Little Bear Creek. Both Bear and Slaughter creeks flow across the recharge zone and the transition zone downstream of the project area. Little Bear Creek flows across the transition zone downstream of the project area. All three creeks join Onion Creek, which ultimately joins the Colorado River in eastern Travis County.

The project area lies within the Balcones Escarpment on the eastern margin of the Edwards Plateau and within the Balcones Fault Zone. The majority of the project area occurs within the recharge zone of the Barton Springs Segment of the Edwards Aquifer where the Edwards and Georgetown limestones are exposed at the surface or occur below the soil layer. The southern end of the project occurs within the aquifer transition zone where the upper aquifer confining units are exposed and where recharge has the potential to occur through faults and fractures. Recharge does not occur uniformly across either the recharge or transition zones. Karst features, which are often formed along fault-related fractures, provide avenues for point aquifer recharge within the recharge and transition zones. While a relatively small amount of recharge does occur through diffuse infiltration across the aquifer outcrop, most recharge in the BSS occurs where overland flow of water is concentrated by topography within drainage and creek channels and within internally draining sinkholes (Hauwert et al 2005, Hauwert 2009, Hauwert and Sharp 2014).

Bedrock geology of the project area consists primarily of various members of the Edwards Group limestone, the Georgetown Formation, and the upper aquifer confining units including the Del Rio and

Buda formations. Exposed members of the Edwards Group include the Dolomitic, Kirschberg Evaporite, and Grainstone members of the Kainer Formation, and the Leached and Collapsed, and Regional Dense members of the Person Formation. Of these members the Leached and Collapsed and the Kirschberg Evaporite are generally considered the most porous and permeable.

Based on mapping performed by the Barton Springs/Edwards Aquifer Conservation District (BS/EACD) and the City of Austin (COA), the project area is crossed by multiple faults, most of which strike to the northeast (BS/EACD 2006, COA 2014). Faults crossing the project area are generally oriented between N20°E and N40°E. Other geologic maps depict slightly different number and orientations for faults within the project area (Garner et al. 1992). We find the BS/EACD / COA map to be the most accurate map that includes the project areas. We have used this base map in the site geologic maps with modifications based on site specific observations as discussed in the results section. Geophysical investigations can be used to detect known and unmapped faults and were used to refine the BS/EACD interpretation.

Due to the interplay of faulting and erosion along the escarpment the thickness of the Edwards aquifer beneath the project area ranges from approximately 200 feet in the northwest along the existing SH 45 right of way to over 400 feet to the southeast approaching Bliss Spillar Road. Figures 3, 4, and 5 present the geology, stratigraphic column and generalized geologic cross section for the project area.

Two primary pathways for aquifer recharge occur within or adjacent to the right of way. First, the bed of Bear Creek is known to contribute a significant percentage of the overall recharge to the Barton Springs zone (Slade 2014). In fact, Slaughter and Bear Creeks are thought to contribute 12 and 10 percent of the total recharge to the BSS respectively and the approximately 6 channel-mile stretch of Bear Creek located on the recharge zone is capable of recharging up to 33 cubic feet per second into the aquifer (Slade et al. 1986). Approximately 1.5 miles of this stretch of Bear Creek is located within or downstream of the project area and at least seven faults occur in the creek bed downstream of the project.

Second, the right of way includes a portion of the surface drainage basin of Flint Ridge Cave (FRC) which is one of the single largest upland recharge features in the recharge zone (Hauwert et al. 2005, Hauwert and Nico 2009, Hauwert et al 2010). None of the individual upland karst features detected within the ROW are as hydrologically significant as FRC, the entrance of which is located approximately 150 feet east of the ROW. George Veni and Associates conducted an assessment of FRC and the neighboring Quad-border Sink (QBS) where he described the drainage basin for FRC at over 40 acres, with approximately 3,348 m^3 (2.7 acre-feet) of water entering the BSS/EA per year from this location (Veni 2000). QBS and its drainage basin are located outside of the right of way to the east. Veni describes QBS as an approximately 400-foot wide by 4-foot deep depression with a 38-acre drainage basin (Ibid). The project right of way does not include the surface drainage basin for QBS. A water balance study conducted by Nico Hauwert estimated that 22,135 m^3 (17.9 acre-feet) of discrete recharge entered FRC in a 12-month period, and concludes that the "bowl volume" of a sinkhole, "is an excellent indicator of its recharge significance." Hauwert has estimated the surface drainage basin for FRC at up to 69 acres, much of which is within the ROW (Hauwert et al. 2005, Hauwert and Nico 2009, Hauwert et al 2010).

Groundwater dye tracing studies have been conducted on caves and sinkholes in the vicinity of the project area. These studies show that water recharging the aquifer through karst features flows to Barton Springs, the main outlet of the BSS/EA, within three to 28 days, depending on flow conditions (BS/EACD 2002, BS/EACD 2006). Although estimated recharge at FRC is small (2.7 acre-feet per year) relative to the amount of annual pumpage or spring discharge from the aquifer (40,000 acre-feet per year), FRC still ranks as one of the most significant upland recharge features within the BSS/EA (Smith and Hunt 2004a, 2004b).

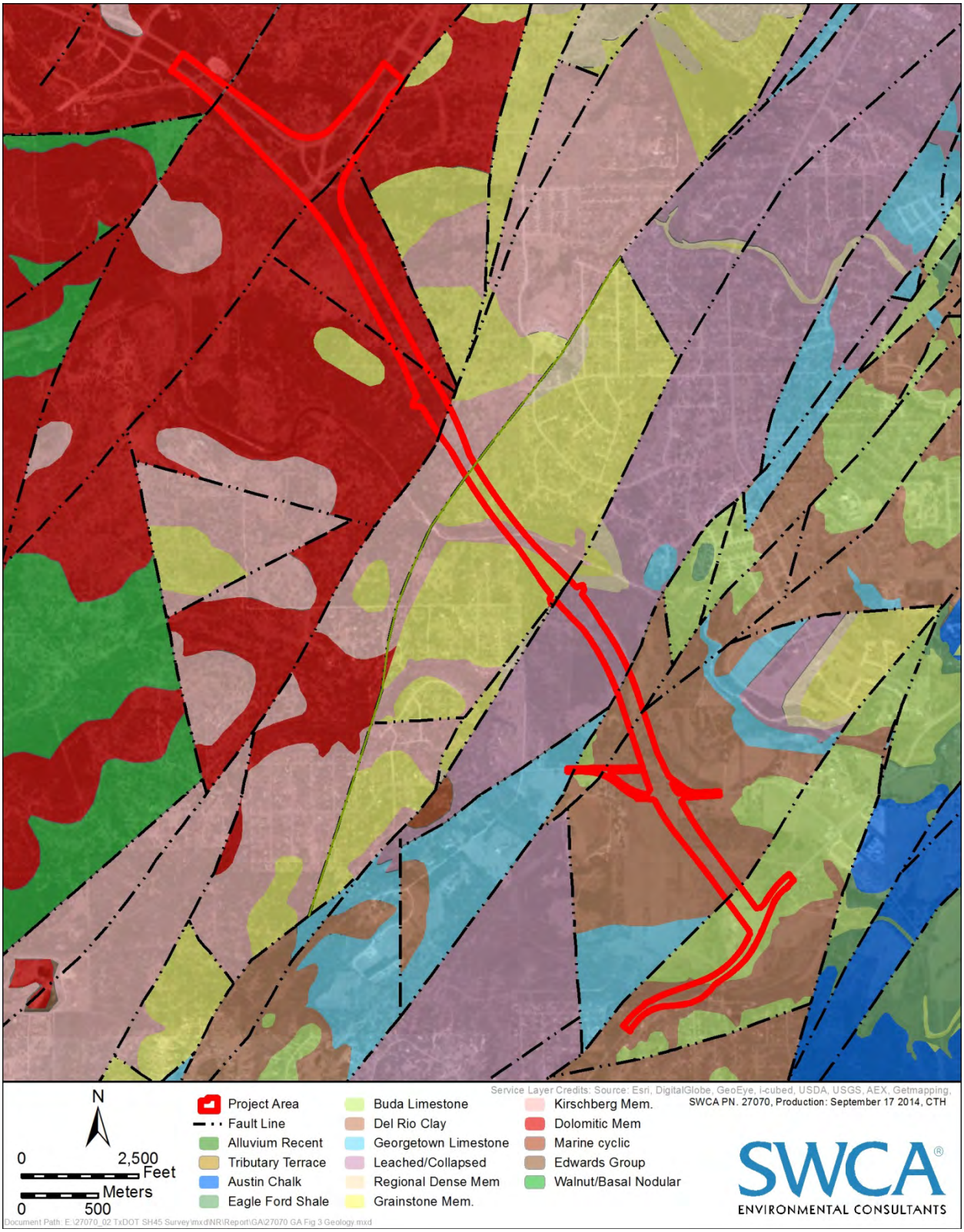


Figure 3. Regional geology.

Soils occurring in the project area are mapped within the Crawford (CrB), Denton (DeC3), Eckrant (ErG), Heiden (HeB, HeC2, HeC3), Medlin-Eckrant (MED), Mixed Alluvial Land (Md), Rumple-Comfort Complex (RuD), Speck (SsC, SpB), Tarplay (TaB), and Tarrant (TaD) series soils (USDA 1974; 1984; http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). Figure 6 presents the distribution of soils in the project area.

The Crawford, Denton, Eckrant, Heiden, Medlin-Eckrant, Speck, Tarplay, and Tarrant series soils are within the "D" classification of the hydrologic soil groups. Type "D" soils have a very slow infiltration rate (very high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The Rumple-Comfort Complex series soil is within the "C" classification of the hydrologic soil groups. Type "C" soils have a slow infiltration rate when thoroughly wet. These consists chiefly of soils that have a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

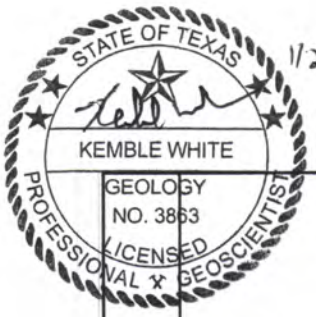
The Mixed Alluvial Land series soil is within the "A" classification of the hydrologic soil groups. Type "A" soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Of the soil types in the project area the Speck series is of particular interest because of its unusual thickness in the project area and due to its association with Pleistocene terra rossa deposits known from central Texas. Most of the project area is underlain by Speck soils. Terra rossa deposits are clay rich paleosols formed from in-situ weathering of limestone units during long periods of wet climatic conditions such as those that are known to have occurred in central Texas during the glacial periods of the Pleistocene and earlier (Young 1986). Young (1986) defines terras rossas as "diagenetically altered paleosols that formed on limestone terrains under humid and tropical or nearly tropical, climatic regimes of approximately 1500 mm or more of rainfall per year." Figure 7 presents the distribution of four of the well-known terra rossa deposits along the Balcones Escarpment. The project area is located within a mapped deposit of terra rossa which straddles the Hays/Travis County line. Within these areas the typical characteristics of the recharge zone do not occur. Whereas outcrops of the Edwards group typically exhibit thin to absent soils, abundant rock outcrops and scrubby live/oak-juniper vegetation, the terra rossa terrains have relatively deep heavy clay soils, few rock outcrops, and vegetation including mesquite trees which are typically found on the Del Rio Clay but are rare within the recharge zone. Incidentally, terra rossa soils are globally associated with grape production and wineries. Most of the wineries in Texas are located on terra rossa soils in the Llano uplift area of the Edwards Plateau. Along with mesquite trees the wild mustang grape is abundant within the project area. Excavation activities associated with this investigation indicate that the terra rossa varies between 6 inches and four feet thick with typical thickness averaging about 2 feet. A number of karst features were found to contain more than 10 feet of terra rossa. Relative to typical recharge zone conditions, the majority of the project area is less conducive to on-site recharge and more subject to evapotranspiration and runoff.

In 2005 TxDOT commissioned a detailed site-specific investigation of soil conditions in the project area (Wilding 2005). During the 2007 investigation professional soil scientists and hydrogeologists conducted field studies within the FRC drainage basin and the Headquarter Flat Sink Cave (HFSC) site just to the northeast of the project area. The findings of those studies can be summarized as follows:

- Soil diversity is greater than illustrated on existing NRCS soil maps;
- Soil properties serve as strong buffers to aquifer contamination;
- High clay contents serve as a significant buffer to aquifer recharge;
- Major pathways of water movement exist along roots and rocks, but preferential flow is less than earlier anticipated using brilliant blue dye;
- Limited water flow through subjacent limestone occurs because of clay-plugged macrovoids and fissures;
- Due to increased impervious cover, enhanced surface runoff is likely to be a major construction impact;
- Overland flow of surface water is most critical when soils are very moist to saturated;
- A higher percentage of soils at HFSC are shallower than at FRC;
- Soil texture, clay content, and stone content at the two sites are similar;
- Infiltration rates are expected to be higher at FRC than HFSC because soil depths are greater at FRC; and
- It is expected that water runoff from soils at the HFSC site would be greater than at the FRC site.

Although soils within the right of way seem to promote runoff over recharge, soils in other parts of southern Travis County have been shown to transmit small amounts of water to caves through ceiling drips (Cowan and Hauwert 2013).



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Upper Cretaceous	Upper Confining Units			Navarro and Taylor Groups, undivided; 600 feet thick	
				Austin Group (Kau); 130–150 feet thick	
				Eagle Ford Group (Kef); 30–50 feet thick	
				Buda Limestone (Kbu); 40–50 feet thick	
				Del Rio Clay (Kdr); 50–60 feet thick	
Lower Cretaceous	I	Edwards Aquifer	Edwards Group (Ked)	Georgetown Formation (Kgt)	40-60 feet thick
	II			Person Formation; 50–180 feet thick	Cyclic and Marine member, undivided (cm)
	III				Leached and Collapsed member, undivided (lc)
	IV				Regional Dense member (rdm)
	V			Kainer Formation; 265–345 feet thick	Grainstone member (gs)
	VI				Kirschberg Evaporite member (ks)
	VII				Dolomitic member (do)
	VIII				Basal Nodular member (bn)
	Lower Confining Units			Upper member of Glen Rose Limestone (Kgr); 350–500 feet thick	

Figure 4. Stratigraphic column for the project area (shaded units are present within the right of way).[1]

[1] Modified from: Small, T. A., J. A. Hanson, and N. M. Hauwert. 1996. Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop (Barton Springs Segment), Northeastern Hays and Southwestern Travis Counties, Texas. U.S. Geological Survey Water-Resources Investigations Report 96-4306.

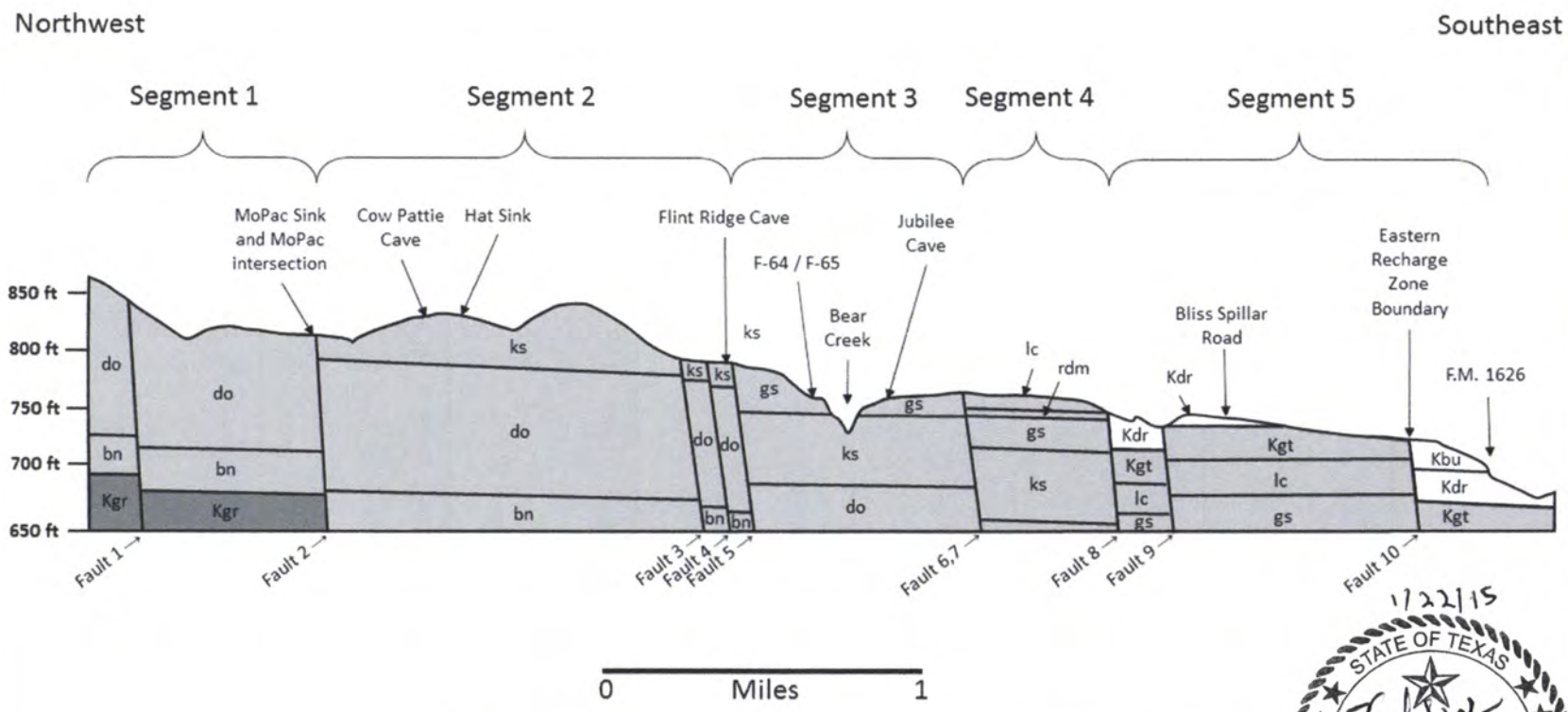

Figure 5. Generalized geologic cross section of the project area.

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STATE OF TEXAS
KEMBLE WHITE
GEOLOGY
NO. 3863
LICENSED
PROFESSIONAL GEOSCIENTIST

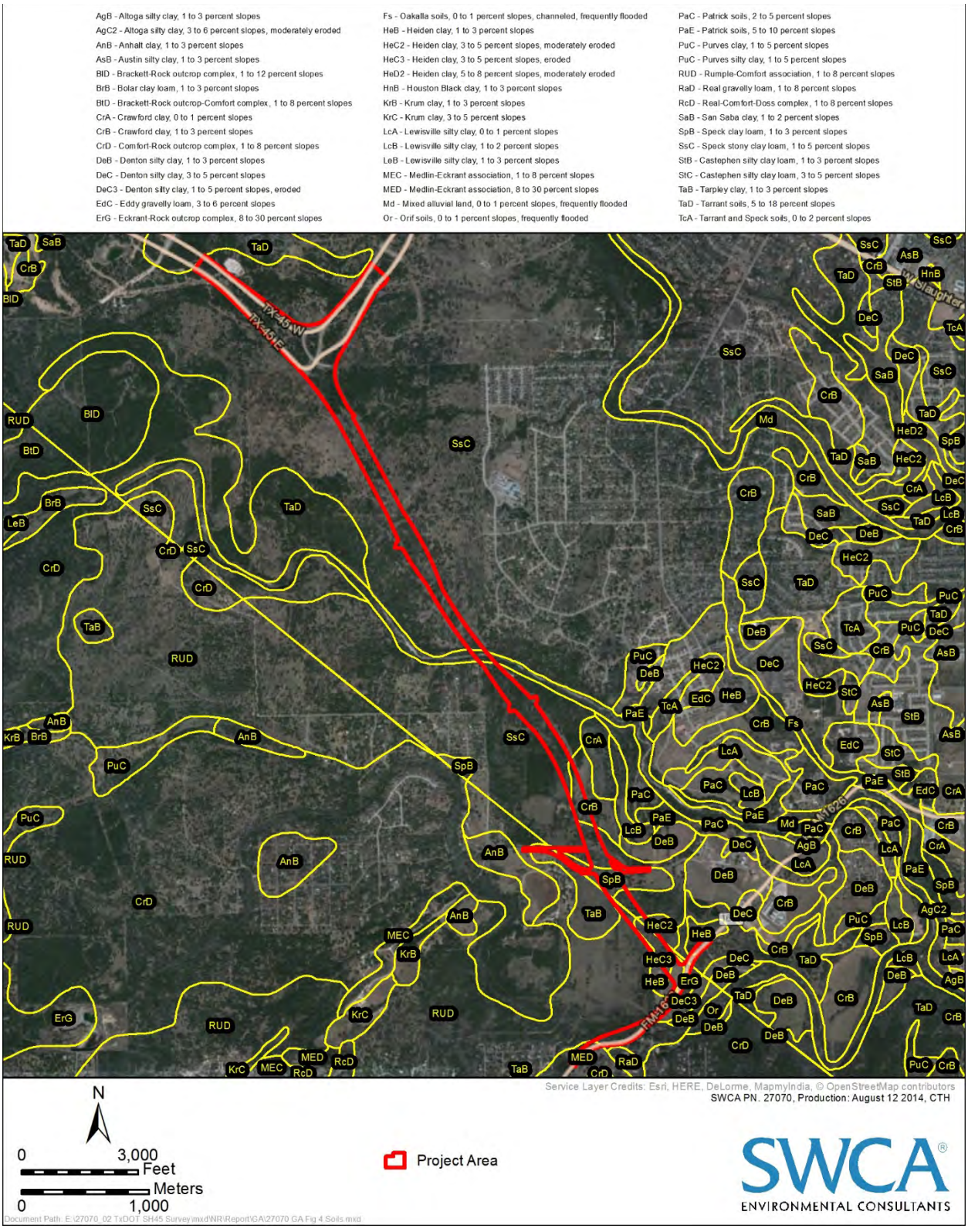

Figure 6. Soils of the project area.

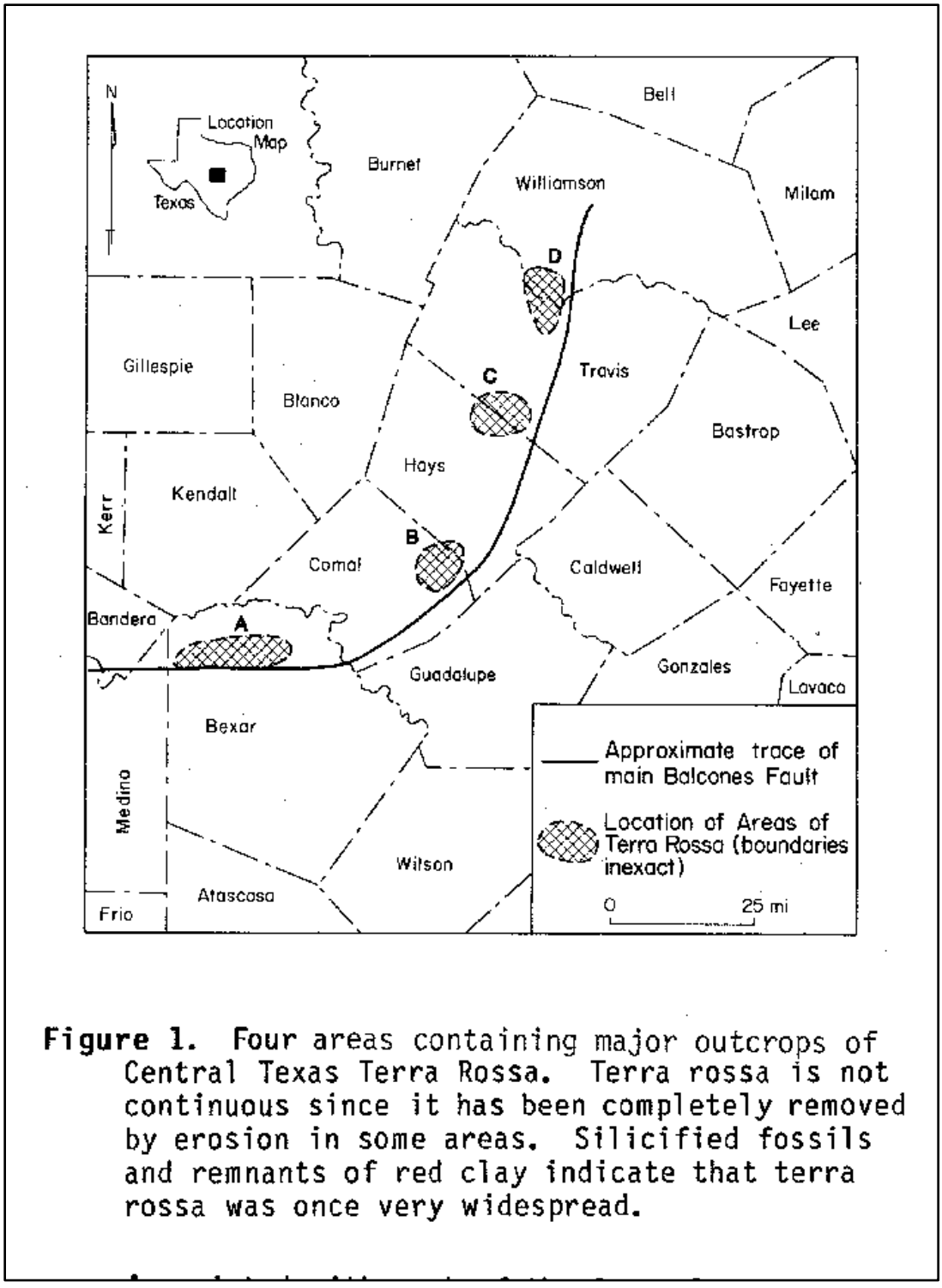

Figure 1. Four areas containing major outcrops of Central Texas Terra Rossa. Terra rossa is not continuous since it has been completely removed by erosion in some areas. Silicified fossils and remnants of red clay indicate that terra rossa was once very widespread.

Figure 7. Distribution of terra rossa paleosols from Young (1986). The project area occurs within area "C" above.

RESULTS

More than 220 individual landscape features were investigated as potential recharge features (See Site Geologic Maps). An intensive period of excavation resulted in non-karst designation for approximately 90 percent of the features investigated. Most of the non-karst features were formed within the layer of terra rossa above the bedrock surface and were determined to be the result of burrowing activities of small mammals, stump holes, or excavation scars from ranching activities. Twenty-seven features were determined to be of karst origin and they can be divided into sensitive and non-sensitive categories. The sensitive features include five caves[2], four sinkholes, and eight solution cavities with the capacity for rapid recharge. Some of these features were determined to be fault-related (Table 1). The non-sensitive features include epikarstic solution cavities and superficial weathering surfaces (rillenkarren) which were encased in low-permeability terra rossa paleosol. We assume that these features will be backfilled with the formerly in-situ materials removed from them restoring them to their pre-excavation hydrologic condition. Ten faults were identified as crossing the project area. Three of the faults were determined to be sensitive in the area of sensitive features expressed at the surface within or adjacent to the fault plane. The other eight were determined to be non-sensitive due to the lack of sensitive features expressed along the fault plane and the presence of a relatively thick clay-rich soil cover.

Based on the experience of professional geoscientists involved in this study, our results include a relatively low number of sensitive features compared to other survey areas of equivalent size elsewhere in the Edwards aquifer recharge zone. We believe this is due to the presence of a relatively thick deposit of Pleistocene terra rossa paleosol across a large portion of the survey area.

Our literature review and communication with various members of the technical working group for the project indicated the presence of a number of sensitive features to the east and west of the right of way. Only their general locations are indicated on the site geologic maps so as to prevent public dissemination of sensitive cave and karst feature locations.

In terms of hydrogeological sensitivity the SH 45 project area can be divided into 5 segments divided from one another by faults as depicted in Figure 5. Segments 1 and 3 exhibit the highest degree of sensitivity within the right of way. Segments 4 and 5 exhibit the lowest degree of sensitivity. From north to south the segments are as follows:

Segment 1 includes exposures of the dolomitic member of the Edwards aquifer occurring along the existing section of SH 45 and MoPac. In this area soils are thin, bedrock exposures are relatively common and several sensitive features are formed along a major fault (Fault 2) that defines the eastern edge of this segment. Two of the most sensitive features in the right of way (MoPac Sink and SH 45 Cave) occur in this segment.

Segment 2 includes exposures of the Kirschberg Evaporite member of the Edwards aquifer between Fault 2 near the MoPac intersection and Fault 5 which crosses the right of way approximately 1,200 feet north of Bear Creek. The presence of a consistent cover of terra rossa clay soil in this area causes runoff to predominate over recharge. Several sensitive features occur within this segment including Cow Pattie Cave and Hat Sink. This segment also contains a portion of the surface drainage basin for Flint Ridge Cave.

[2] Features F-157a and F-157b consist of one cave with two entrances each of which is treated as an individual feature in the attached geologic assessment tables

Segment 3 includes exposures of the Grainstone and Kirschberg Evaporite members within a single fault block extending for approximately 3,000 feet straddling Bear Creek. This section is bounded by Fault 5 and Faults 6 and 7 which converge on one another within the right of way. The terra rossa cover is worn thin in this segment likely due to increased erosion along the steeper slopes of the Bear Creek valley. Three of the most sensitive features in the right of way occur here including Jubilee Cave and caves F-64 and F-65 which are adjacent to one another.

Segment 4 is underlain by the leached and collapsed member within a single fault block bounded by Faults 7 and 8. Soils thicken again within this segment and bedrock exposures are generally absent. No karst features were found in this area, but several large karst depressions can be seen within this fault block outside of the right of way. Barker Ranch sink is formed in this fault block to the northeast within the Shady Hollow neighborhood. In aerial imagery from the morning after the October 31st 2013 floods, a large depression can be seen holding water southwest of the right of way just east of the intersection of Bliss Spillar Road and Cattleman Drive. Due to the lack of observable karst features and relatively thick soils this segment appears to have less sensitivity than segments 1 and 3.

Segment 5 is underlain by the upper confining units including the Del Rio Clay and the Buda Formation extending for approximately 6,000 feet from Fault 8 to the southern terminus of the project area. An apparent exposure of the Georgetown Formation was observed in a backhoe trench south of Old Bliss Spillar Road which suggests a potential revision to available geologic maps. No karstic strata are exposed within this segment and the right of way crosses out of the recharge zone approximately 1,000 feet from the southern end of the segment at the location of Fault 10. No karst features were located in this segment. This segment exhibits the lowest sensitivity of the five segments.

The location and orientation of faults presented in the site geologic maps is based on the most current geologic mapping conducted by the City of Austin (City of Austin 2014). Minor revisions were made herein to the lithological interpretation in two locations based on site-specific observations. First, in the northern end of the project between faults 1 and 2 (Site Geologic Maps 2 of 12 and 3 of 12) in the vicinity of features F-157 a & b and F-170 the lithology appears to be that of the Dolomitic member of the Edwards rather than the Leached and Collapsed as indicated by the current COA map. Second, in the southern end of the project area south of Bliss Spillar Road (Site Geologic Map 10 of 12) a backhoe excavation at feature F-168 produced an outcrop of what appeared to be Georgetown limestone rather than Del Rio Clay.

Table 1. Description and sensitivity of faults identified as crossing the right of way.

	Sensitivity	**Expression at Surface**	**Juxtaposed Formations**
Fault 1	Sensitive where expressed	F-161 fault-oriented fractures exposed in drainage.	Edwards (Dolomitic member) / Edwards (Dolomitic member)
Fault 2	Sensitive where expressed	F-157 a&b, F-170 cave and sinkhole formed in damage zone of fault	Edwards (Kirschberg evaporate member) / Edwards (Dolomitic member)
Fault 3	Sensitive where expressed	F-41 fault oriented fracture	Edwards (Kirschberg evaporite member) / Edwards (Kirschberg evaporite)

	Sensitivity	Expression at Surface	Juxtaposed Formations
Fault 4	Non-sensitive	None: soil covered within right of way	Edwards (Kirschberg evaporate member) / Edwards (Kirschberg evaporite and Dolomitic members)
Fault 5	Non-sensitive	F-62a (just outside of right of way), Flint Ridge Cave (passage occurs between 100 and 150 ft below right of way), Soil-covered at surface within right of way	Edwards (Grainstone member) / Edwards (Kirschberg evaporite member)
Fault 6	Non-sensitive	None: soil-covered within right of way	Edwards (Regional Dense member) / Edwards (Grainstone member)
Fault 7	Non-sensitive	None: soil-covered within right of way	Edwards (Leached and Collapsed member) / Edwards (Regional Dense member)
Fault 8	Non-sensitive	None: soil-covered within right of way	Del Rio / Edwards (Leached and Collapsed member)
Fault 9	Non-sensitive	None: soil-covered within right of way	Del Rio / Del Rio
Fault 10	Non-sensitive	None: soil-covered within right of way	Del Rio / Buda Recharge zone boundary

Our interpretation of site hydrogeology plays upon the factors that allowed Flint Ridge Cave to develop such an anomalously large surface drainage basin. An aerially extensive deposit of terra rossa clay (and the Speck soil series derived from it) generally blankets the majority of the project area. The results of excavation work described above as well as soil studies conducted in 2005 (Wilding 2005) indicate that generally between one and four feet of clay soil are present. This condition causes runoff and evapotranspiration to predominate over recharge throughout most of the project area. Were this not the case the surface drainage basins of other recharge features would have prevented the drainage basin of Flint Ridge Cave from reaching its current size.

Surface drainage basin boundaries have been generated for all sensitive karst features using two different topographic data sources: 1) an aerial survey from 2001, and 2) two-foot LiDAR (Light Detecting and Ranging) contours from 2012. The aerial survey covered a width of about 1400 feet along the project alignment, and produced sub-foot accuracy topographic data. The two-foot LiDAR contours were downloaded from the City of Austin GIS website. A digital terrain model (DTM) was produced from the aerial survey. A triangulated irregular network file was created from the DTM and from the two-foot LiDAR contours. Then the Upstream Trace Tool was used to delineate the drainage areas. Since the aerial survey did not cover small portions of the project, it was merged with LiDAR contours as needed to create a whole project existing DTM. Therefore, subtle differences occur between the two drainage areas.

Based on detailed ground-truthing in the field, the more accurate of the two methods was chosen on a feature-by-feature basis for use in the Site Geologic Maps (Section 3). The largest by far is the drainage basin for FRC which is calculated by these methods to be approximately 55.5-acres in size. Both results are presented here.

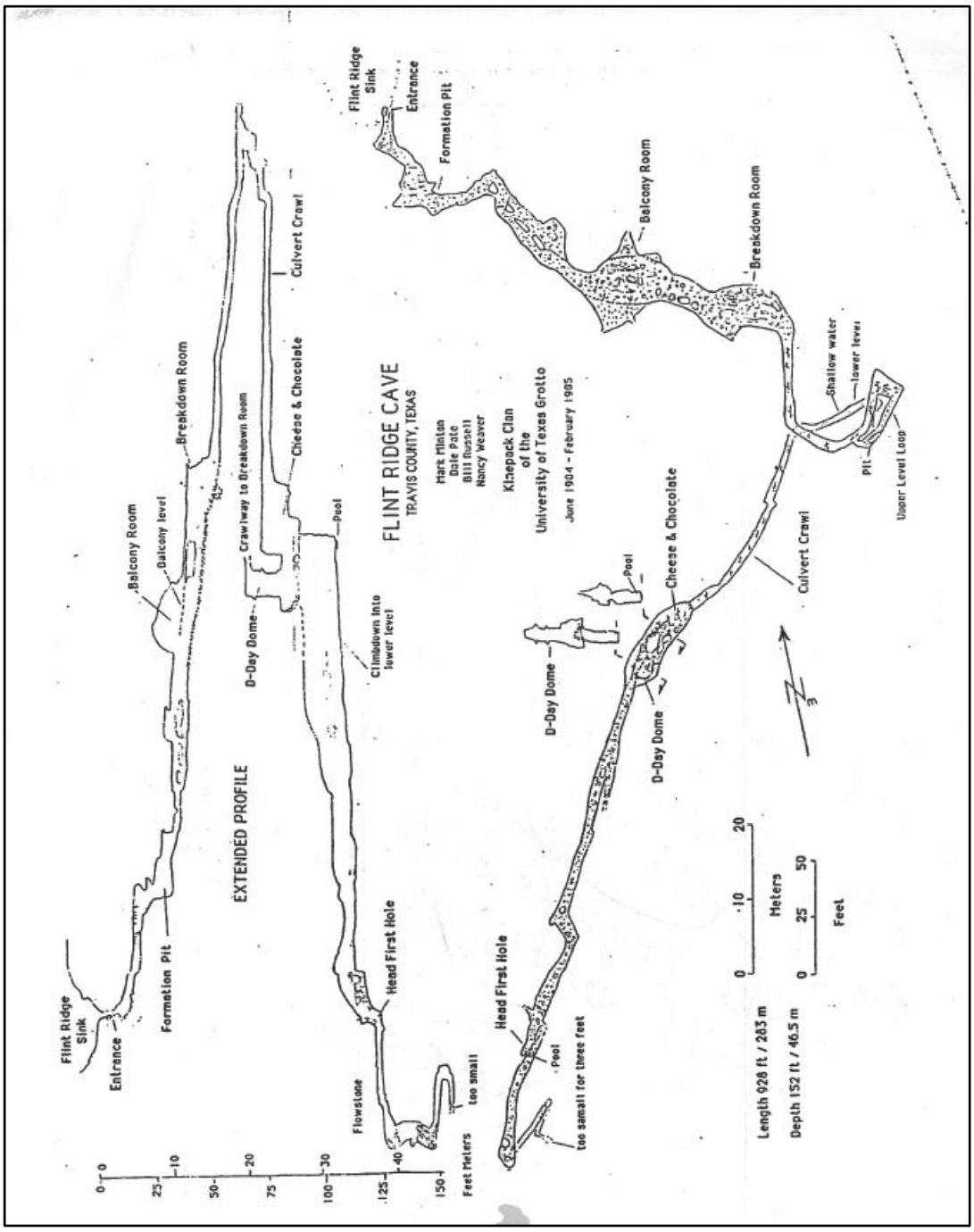

Figure 8. Flint Ridge Cave map.

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SECTION 3.0

GEOLOGIC ASSESSMENT MAPS (MAPS 1 – 12)

Figure 9a. Geologic Assessment Map 1 of 12

Figure 9b. Geologic Assessment Map 2 of 12

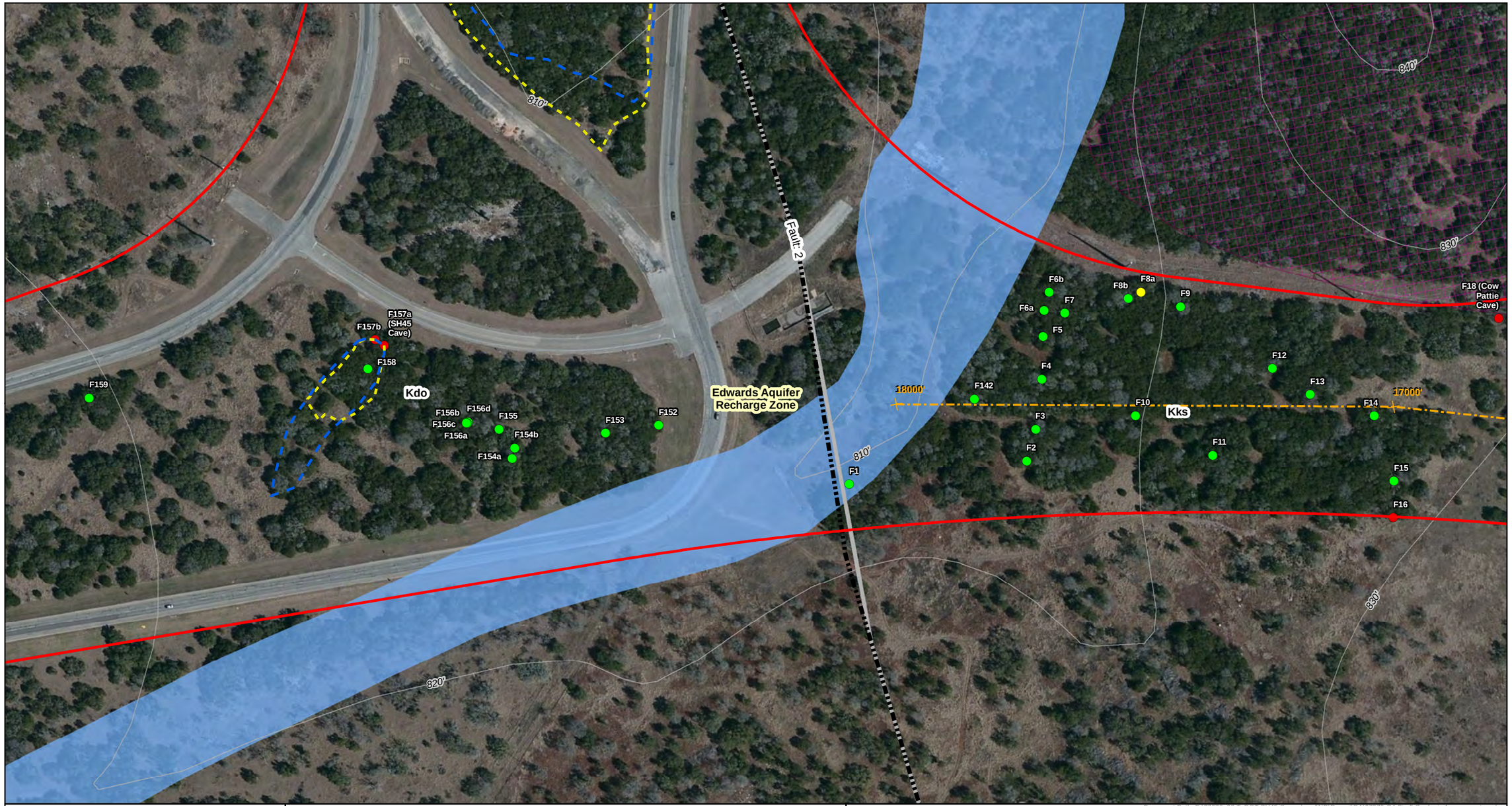


Figure 9c. Geologic Assessment Map 3 of 12

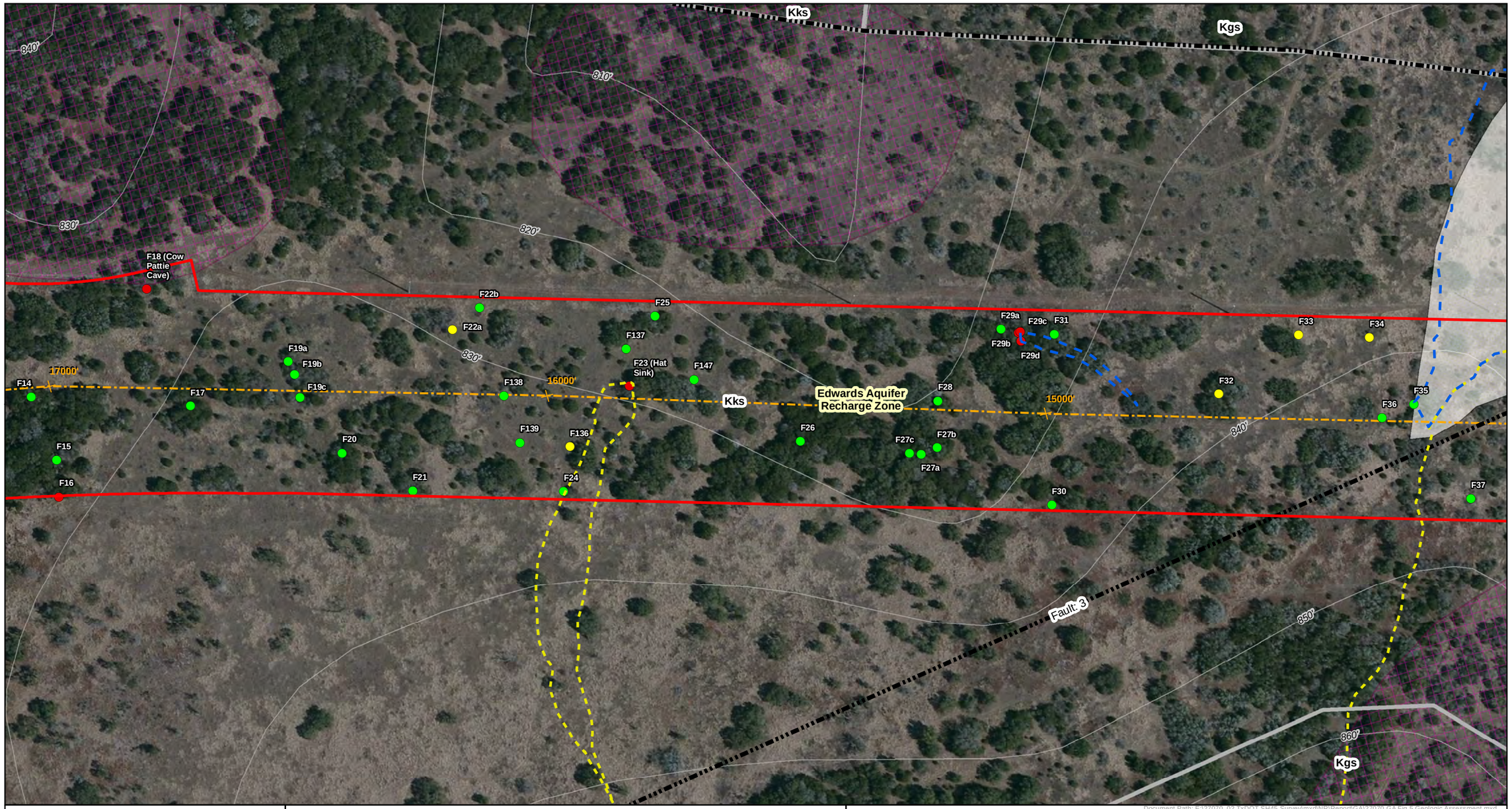
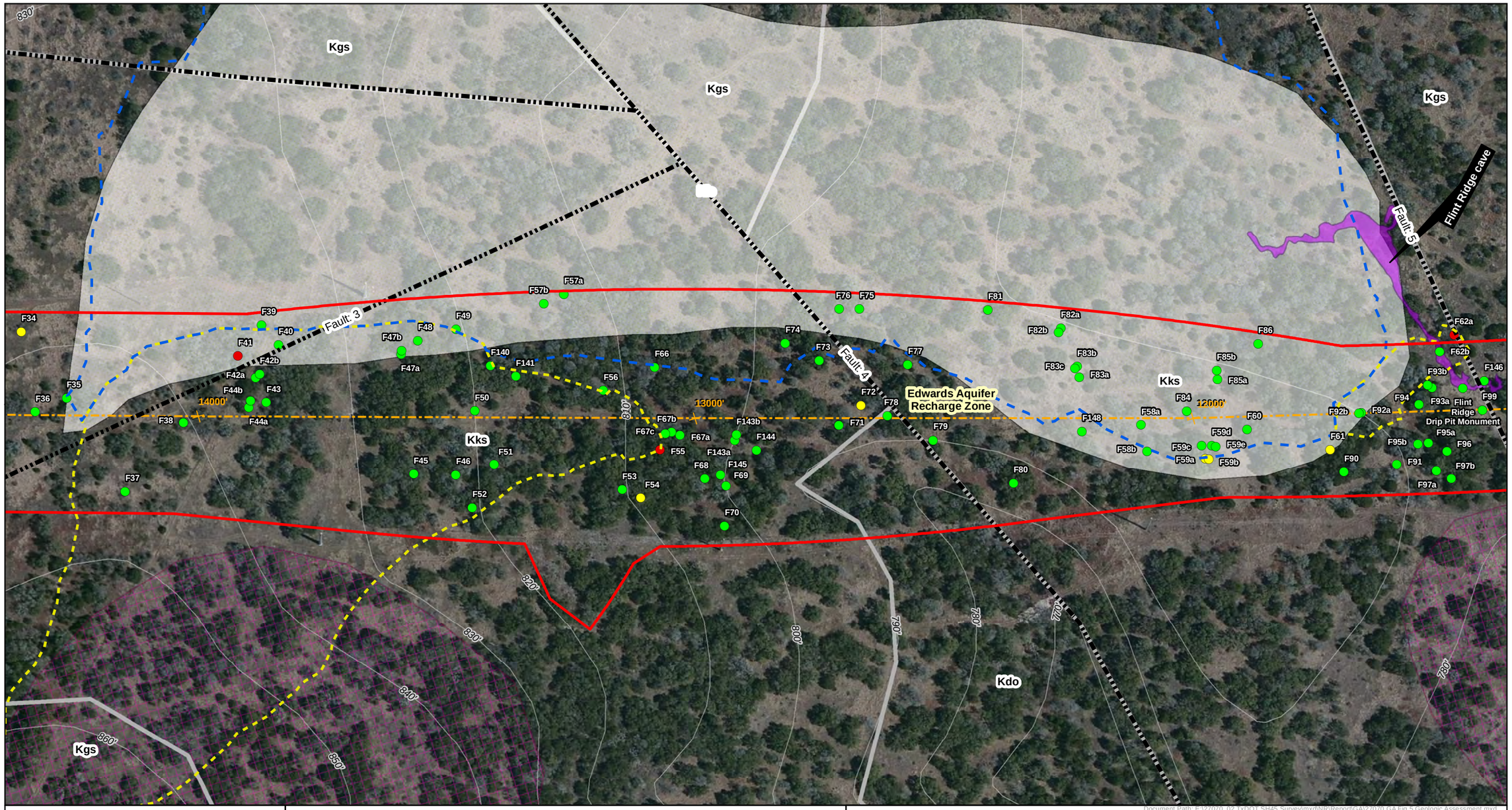
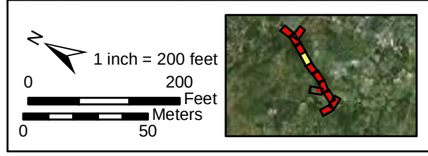


Figure 9d. Geologic Assessment Map 4 of 12





1 inch = 200 feet
0 200
Feet
Meters
0 50

Geology

Fault Line

Kgs - Grainstone Mem.
Kks - Kirschberg Mem.
Klc - Leached/Collapsed
Kdo - Dolomitic Mem

1/22/15
KEMBLE WHITE
GEOLOGY
NO. 5863
STATE OF TEXAS
PROFESSIONAL GEOLOGIST
LICENSED

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
SWCA PN 27070, Production: January 22 2015, CTH, CAC

Project Area
10-ft Contour Line
Geologic Unit
Karst - Sensitive
Karst - Non Sensitive
Non Karst - Non Sensitive
County Boundary
Flint Ridge Cave Footprint
Flint Ridge Cave Drainage Area
Areas Outside ROW with Sensitive Features
Karst Drainage Area (2-ft Lidar Contours)
Karst Drainage Area (Aerial Survey)
Geophysical Survey Centerline
Geophysical Survey Points (1000-foot Interval)

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Figure 9e. Geologic Assessment Map 5 of 12

1 inch = 200 feet
0 200 Feet
0 50 Meters

Geology

Fault Line

Kks - Kirschberg Mem.

Kgs - Grainstone Mem.

1/22/15

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Document Path: E:\27070_02 TxDOT SH45 Survey\mxd\NRI\Report\GA\27070 GA Fig 5 Geologic Assessment.mxd
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SWCA PN 27070, Production: January 22 2015, CTH, CAC

- Project Area
- 10-ft Contour Line
- Geologic Unit
- FEMA Floodplain
- Karst - Sensitive
- Non Karst - Non Sensitive
- County Boundary
- Flint Ridge Cave Footprint
- Flint Ridge Cave Drainage Area
- Areas Outside ROW with Sensitive Features
- Karst Drainage Area (2-ft Lidar Contours)
- Karst Drainage Area (Aerial Survey)
- Geophysical Survey Centerline
- Geophysical Survey Points (1000-foot Interval)

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Figure 9f. Geologic Assessment Map 6 of 12

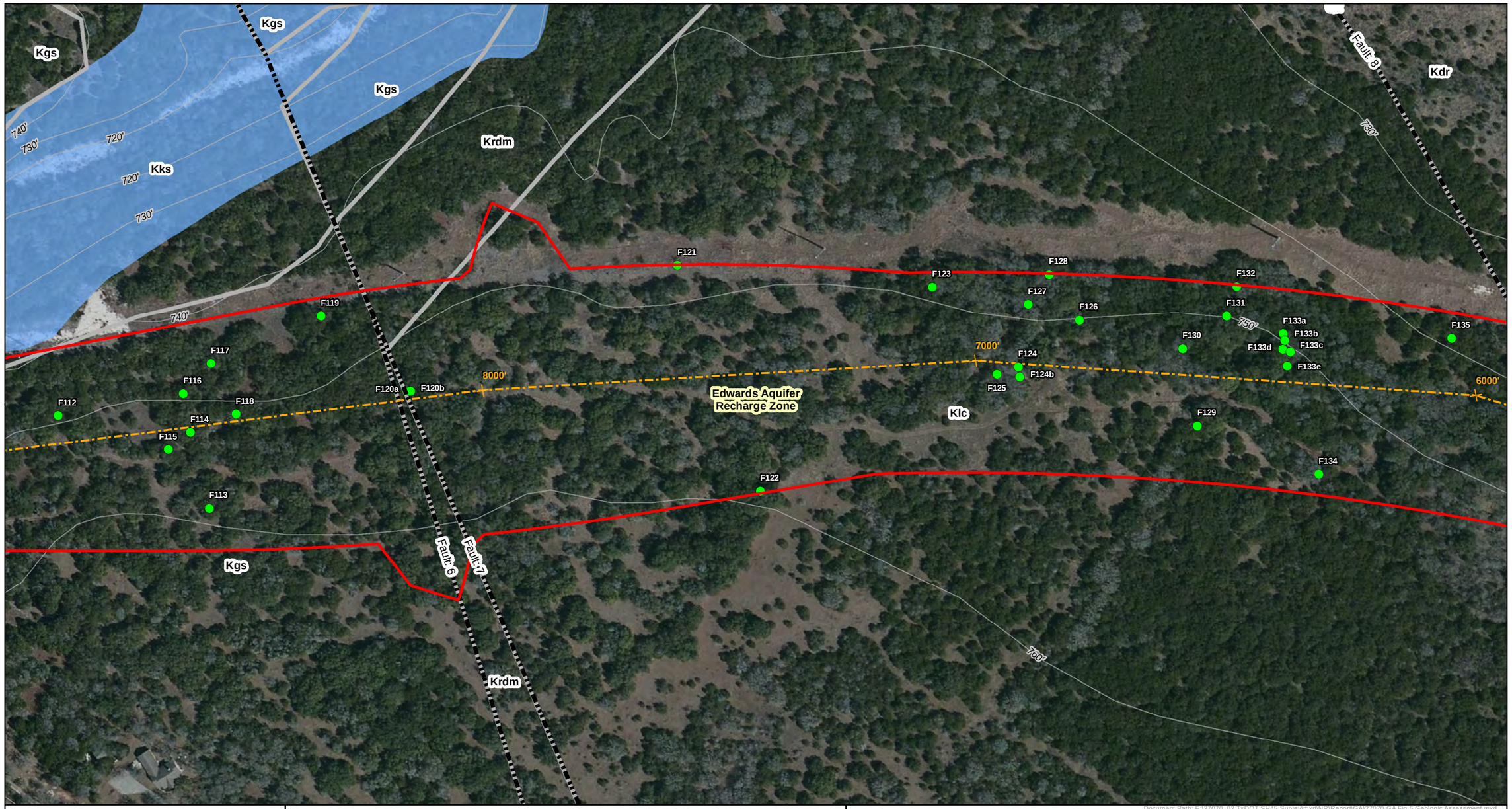


Figure 9g. Geologic Assessment Map 7 of 12

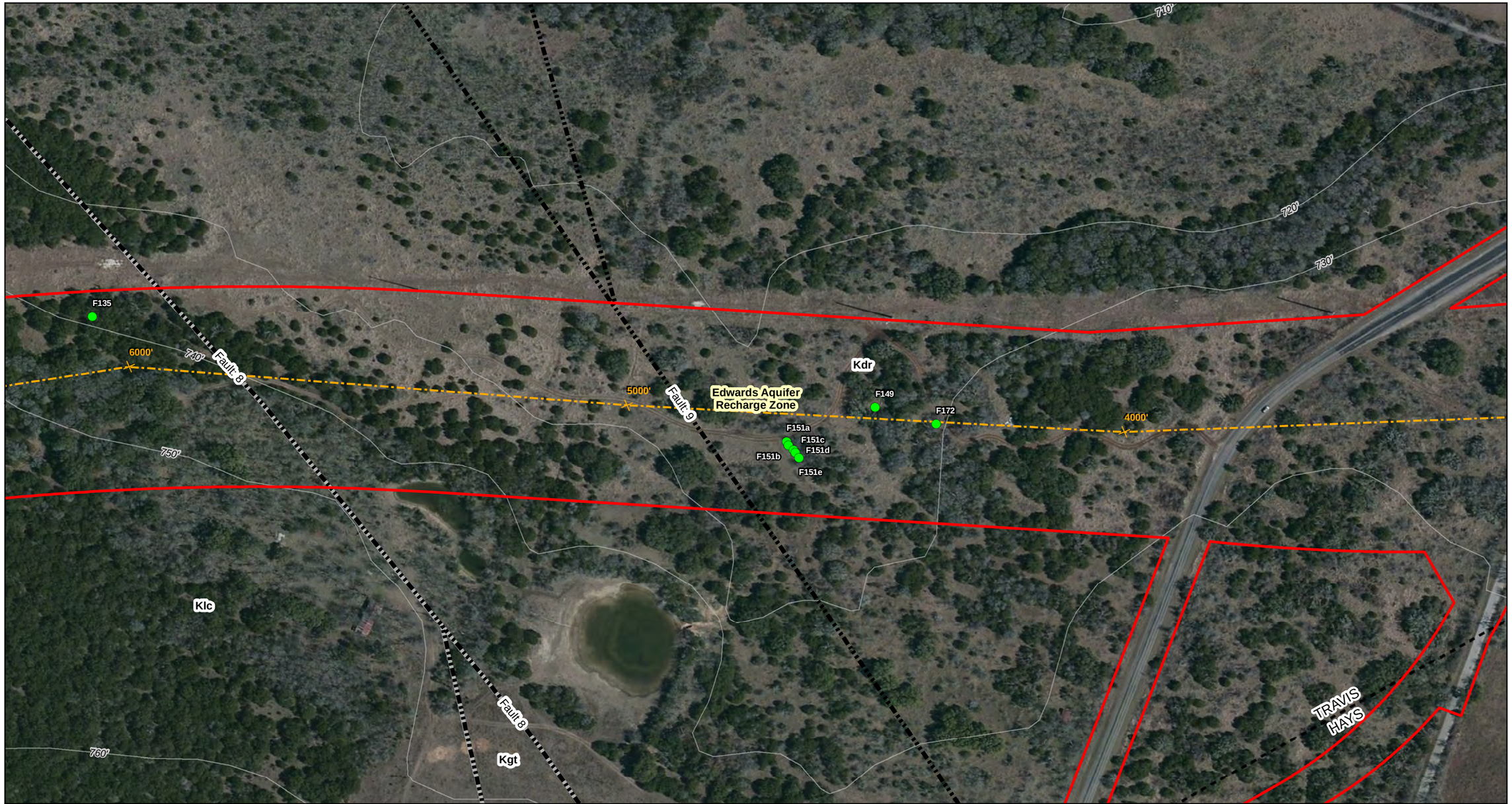


Figure 9h. Geologic Assessment Map 8 of 12

Figure 9i. Geologic Assessment Map 9 of 12

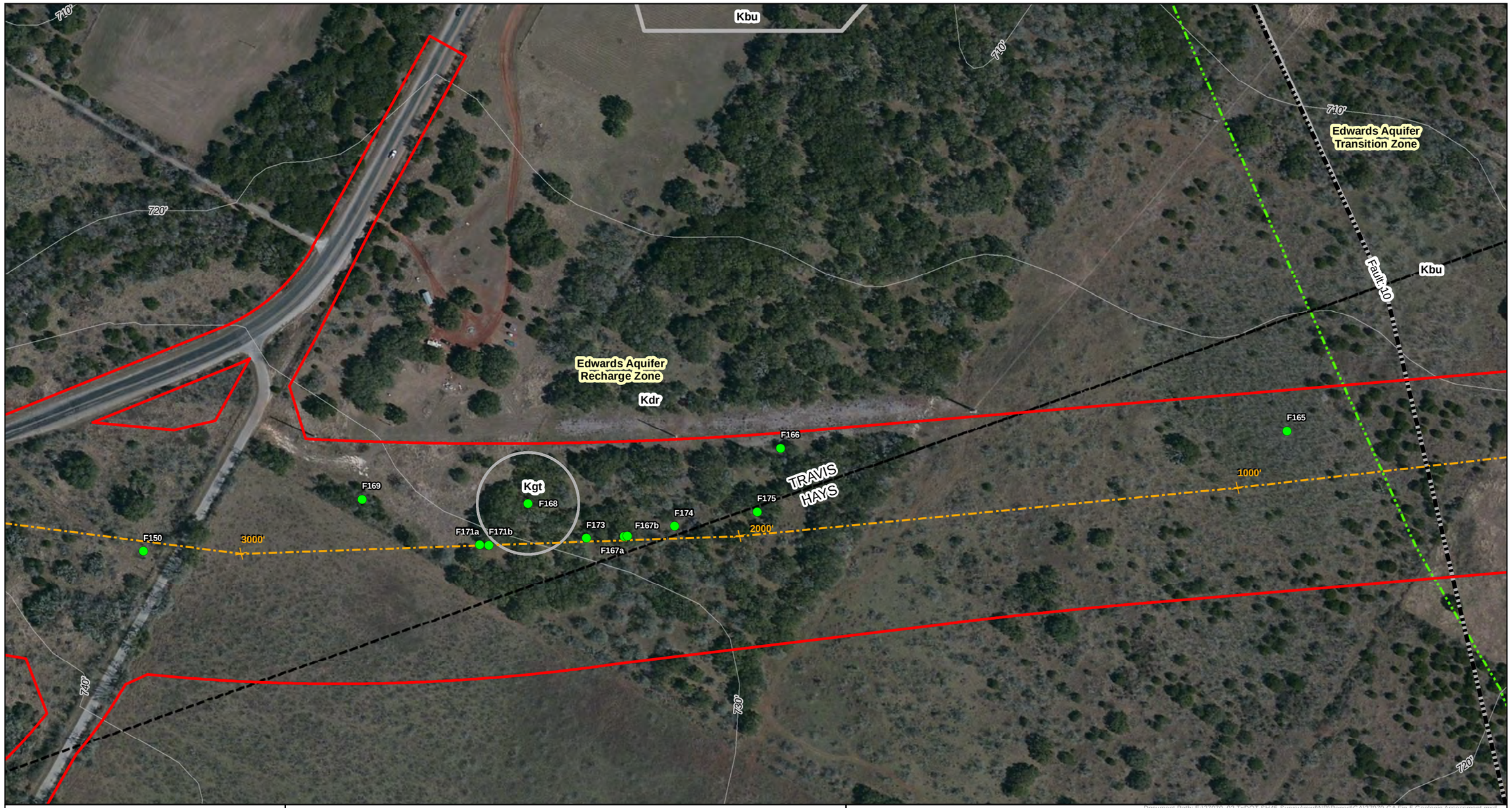


Figure 9j. Geologic Assessment Map 10 of 12

Figure 9k. Geologic Assessment Map 11 of 12

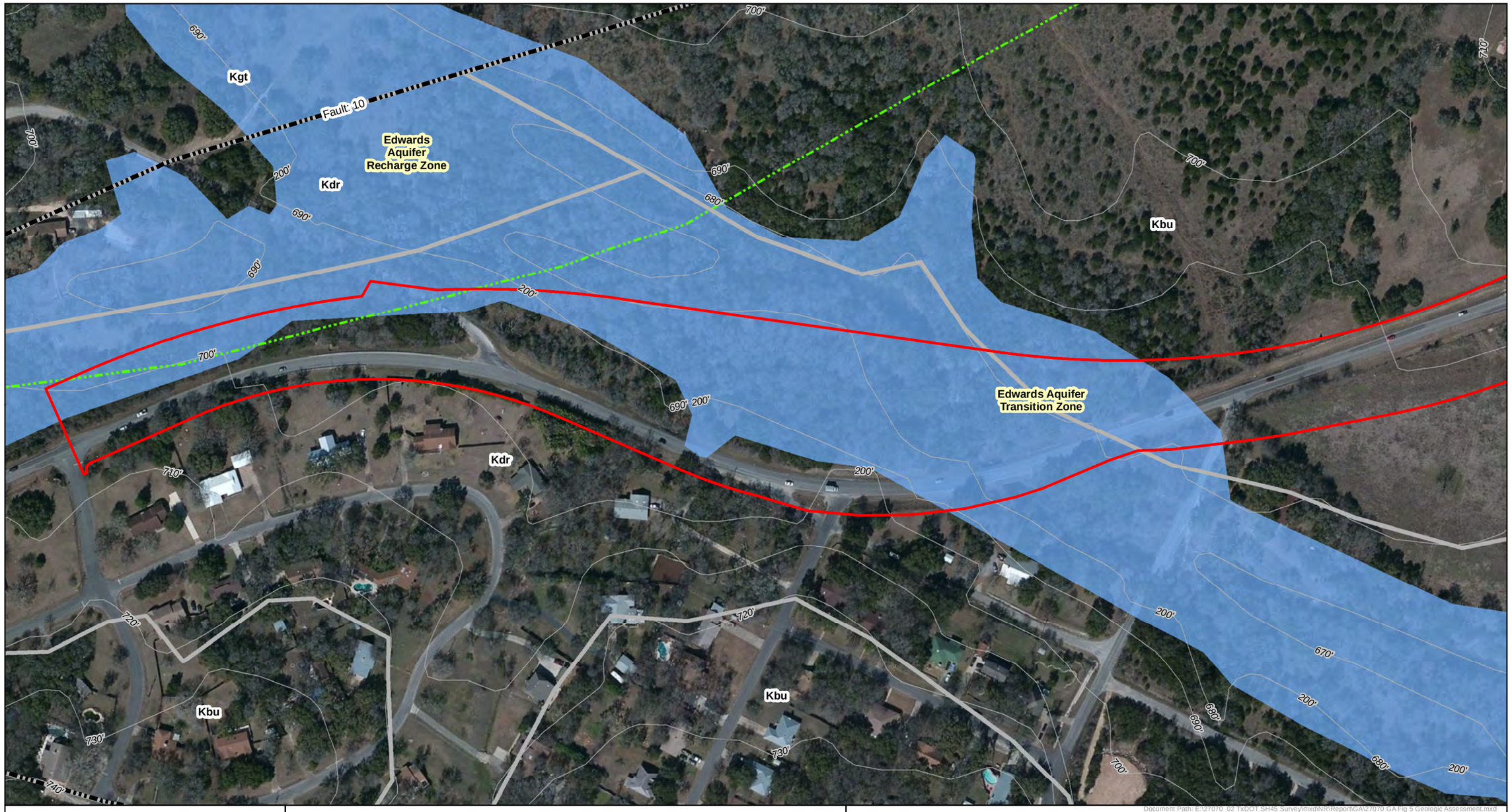


Figure 9l. Geologic Assessment Map 12 of 12

SECTION 4.0

DETAILED DECRIPTIONS OF KARST AND NON-KARST FEATURES

KARST FEATURES: SENSITIVE

F-16 POTENTIAL SINKHOLE

Description:

The feature consists of a potential sinkhole measuring approximately 7 feet long by 4 feet wide by 2 feet deep. The feature was lined with soil and limestone cobbles. The feature is located outside of the TxDOT ROW on private property and therefore this feature has not been excavated.

F-18 CAVE – "COW PATTIE SINK"

Pre-excavation Description:

The feature consists of a large sinkhole that is likely connected to a cave passage. The bowl of the sinkhole measures approximately 40 feet by 38 feet, a more discrete opening in the center measures approximately 8 feet long by 4 feet wide by 7.5 feet deep. The feature appears to have opened up, or unplugged, since the time of the ACI survey. There are about 15 feet of visible open passage trending to the south. (ACI Feature No. 2505)

Post-excavation Description:

Backhoe excavation of the feature formerly known as Cow Pattie Sink has produced a pit measuring approximately 20 feet in diameter and 10 feet deep. Two short sections of crawling cave passage have been opened at different elevations by manual excavation. The upper passage extends horizontally to the southwest for approximately 30 feet. This passage is an upper level drain of the sinkhole formed within a bedding plane occurring between 6 and 9 feet below the surface. The lower passage begins about 4 feet below the upper passage and corkscrews down to a total depth of approximately 19 feet. A crawling passage extends approximately 20 feet to the southwest to a bedrock portal measuring approximately 6 inches in diameter with slight but consistent air flow. A map of this feature is provided in Figure 10.

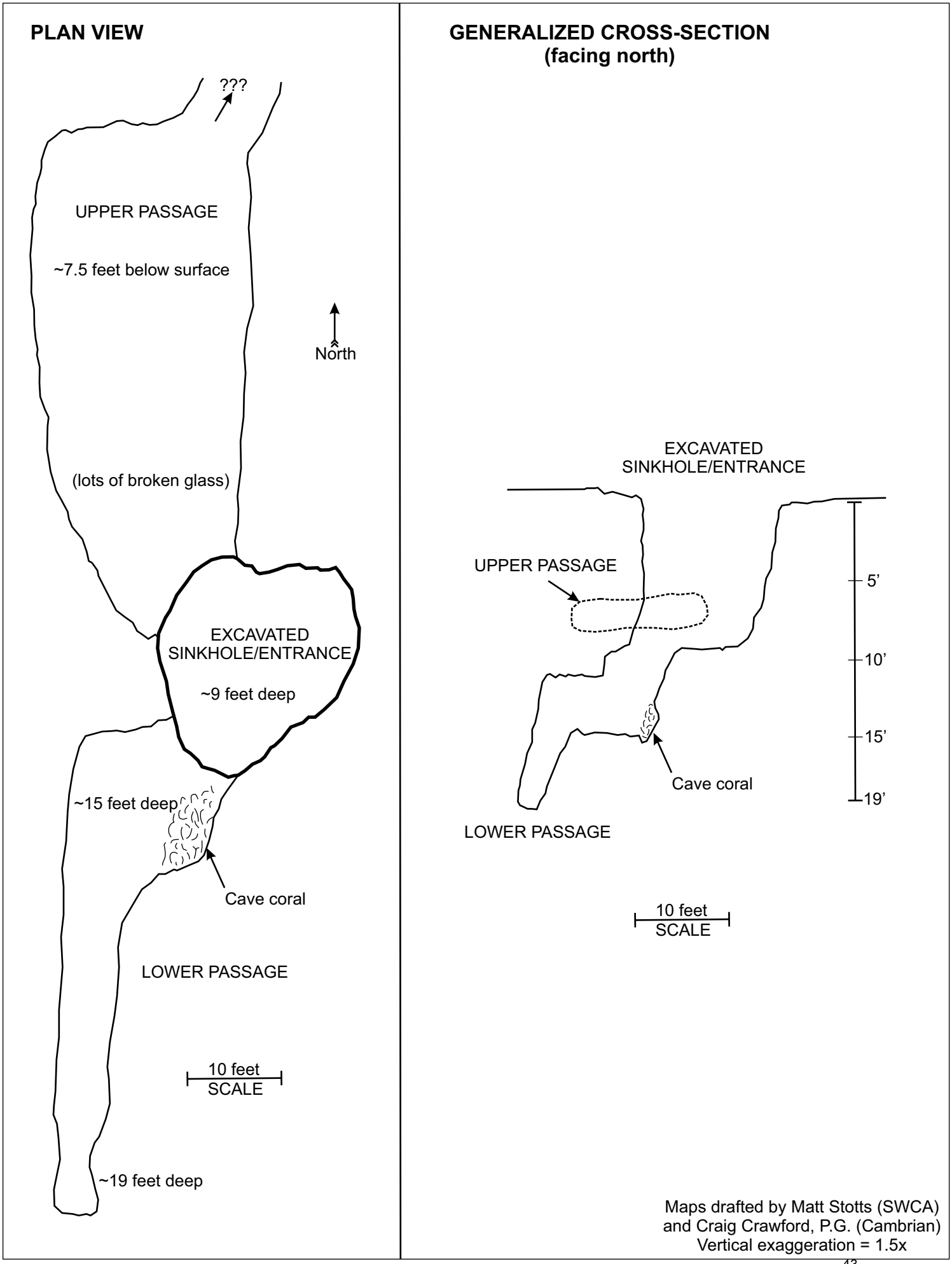


Figure 10. Plan view and cross-section of Cow Pattie Cave (feature F-18).

F-22a SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a solution cavity with an aperture measuring 6 inches in diameter that appears to extend approximately 1 foot deep. This feature is completely encased in limestone and has a small cedar elm growing immediately adjacent to it.

Post-excavation Description:

This feature measures 7 feet long by 5 feet wide by 8 feet deep. Early on, excavation crews found an adjacent void that could be excavated with hand tools and discovered that there was a limestone bridge between the excavated void and the solution cavity. A jackhammer was used to collapse the bridge and widen the solution cavity to allow further access to excavation crews. The infill consists of dark brown clay loam mixed with limestone cobbles. Excavation ceased when conditions became too difficult and it became apparent that this feature was not likely to immediately lead to any large karst voids.

F-23 SINKHOLE – "HAT SINK"

Pre-excavation Description:

The feature consists of sinkhole with the larger bowl measuring approximately 19 feet long by 12 feet wide by 4 feet deep, and a more discrete opening within the bowl measuring 4 feet long by 2 feet wide by 5 feet deep. The feature is lined with soil and limestone cobbles and slabs. The sinkhole is partially rimmed by limestone bedrock and an approximately 25-foot tall cedar elm is growing within the depression. There is likely a cave passage present, however the feature is not currently able to be entered. (ACI Feature No. 2525)

Post-excavation Description:

Excavation of the feature was initiated with the use of mechanical equipment and continued by hand with SWCA excavation crews. A 15 foot diameter opening from the surface drops approximately 9 feet to the first of several limestone shelves. A 9 foot long by 5 foot wide solution cavity extends down another 10 feet; at which point the excavated space is approximately 6 feet in diameter with narrow voids extending to the northwest, west and southwest. Total depth is currently 19 feet below surface. The voids extending to the west contain damp formations, amphibians, and reptiles. Currently, none of these voids are passable by humans. A map of this feature is provided in Figure 11.

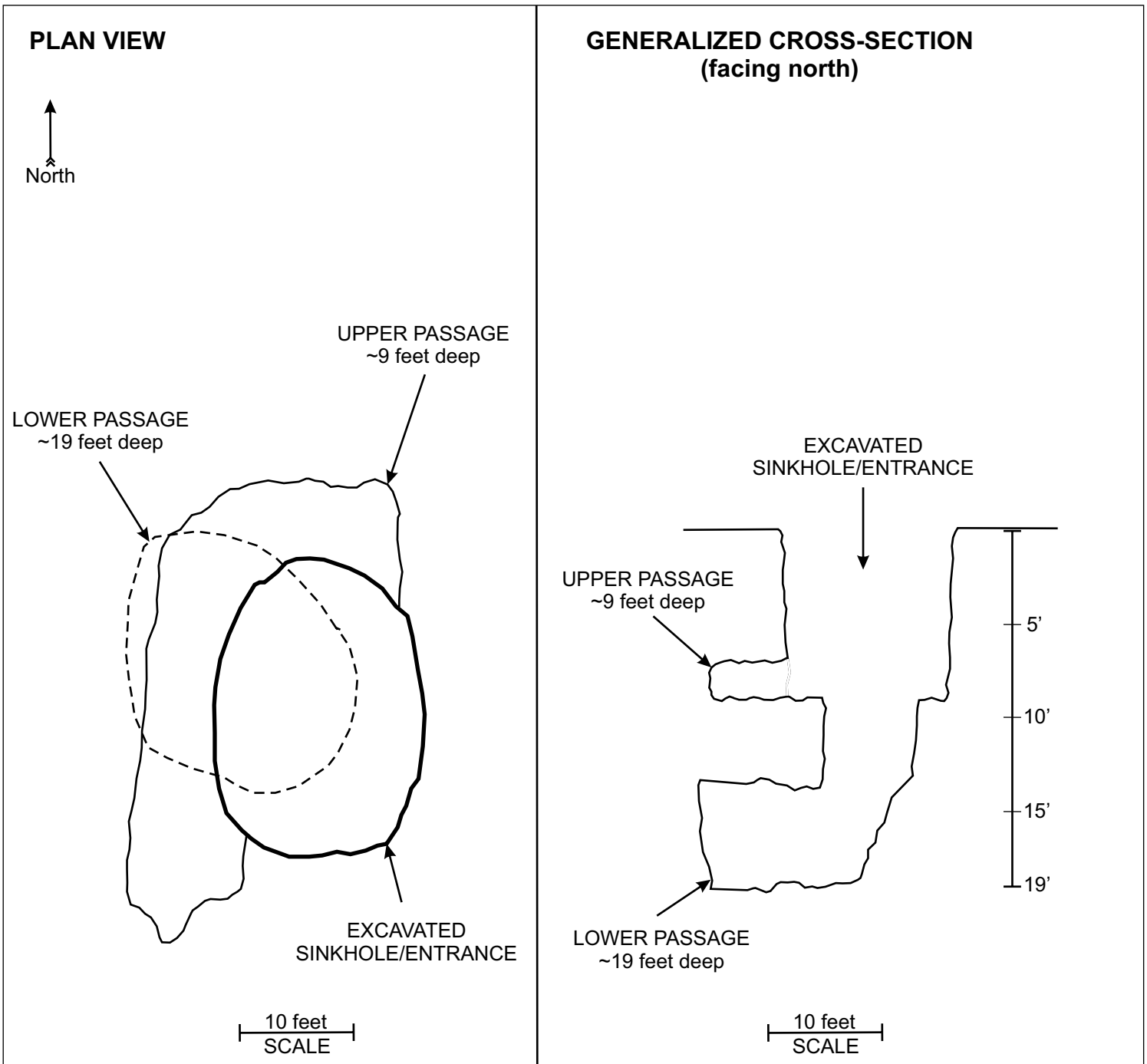


Figure 11. Plan view and cross-section of Hat Sink (feature F-23).

F-29b-c SOLUTION CAVITY

Pre-excavation Description:

Feature 29b measures approximately 1 foot in diameter by 1 foot deep. It is lined with leaf litter, tree roots, limestone cobbles and soil. Slight airflow was detected emitting from the opening.

Feature 29c measures approximately 4 feet long by 2 feet wide by 2 feet deep. It is lined with leaf litter, tree roots, limestone cobbles and soil. Slight airflow was detected emitting from the opening.

Post-excavation Description:

These features were originally two separate features that were hand excavated to reveal adjacent solution cavities. Hand excavation became infeasible as depth increased and the features became too narrow to access. A hoe ram and backhoe were used by TxDOT to allow further access into the ground. These activities collapsed the limestone bridge that separated F-29b and F-29c and these features were merged into one. Hand excavation resumed to reveal a feature that measures 6 feet long by 5 feet wide by 5.5 feet deep. Beneath the western ledge, a narrow bedding plane passage extends 8 feet to the west with a 1.5 foot floor to ceiling height that narrows to 6 inches. The inner walls of this passage are packed with red clay.

F-29d SOLUTION CAVITY

Pre-excavation Description:

Feature 29d measures approximately 6 inches in diameter by 1 foot deep. It is lined with leaf litter, tree roots, limestone cobbles and soil. Slight airflow was detected emitting from the opening.

Post-excavation Description:

This feature was originally hand excavated to reveal a solution cavity. Hand excavation became infeasible as depth increased and the feature became too narrow to access. A hoe ram and backhoe were utilized by TxDOT to allow further access into the ground. Hand excavation resumed to reveal a feature that measures 12 feet long by 8 feet wide by 9 feet deep. A solution cavity measuring 3 feet in diameter that extends 8 feet down was revealed in the southwest corner. It was entirely packed with roots and red clay.

F-41 SOLUTION CAVITY

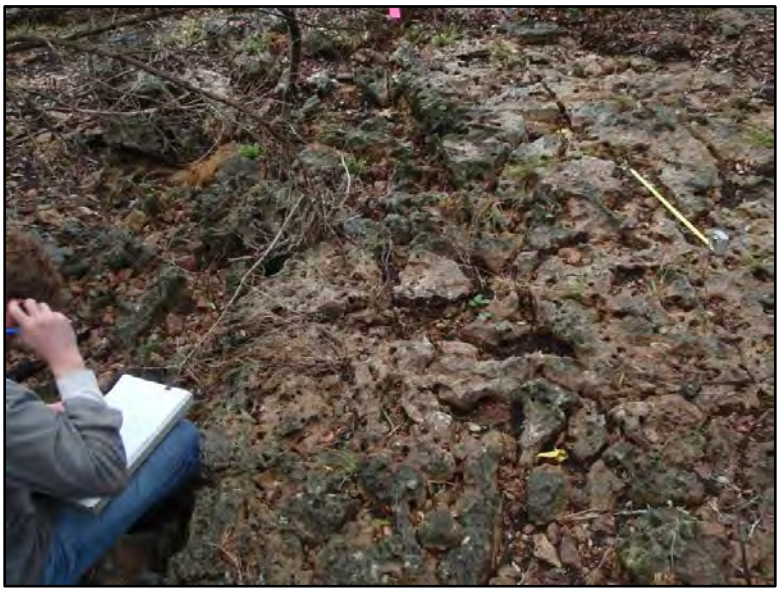
Pre-excavation Description:

The feature was investigated as a potential sinkhole measuring approximately 7 feet long by 3 feet wide by more than 1 foot deep, however the feature was discovered to be a solution cavity during subsequent investigation and excavation of the feature. The feature is partially rimmed by limestone, and had a large grapevine growing out of it. The feature is lined with limestone cobbles and slabs, and organic debris.

Post-excavation Description:

During the excavation process several large slabs of limestone were removed, along with limestone cobbles and dark brown loam. A solution cavity measuring approximately 6 inches in diameter by 1 foot deep was revealed. Further excavation removed limestone cobbles and clay loam infill. Excavation ceased when bedrock was encountered. Out of an abundance of caution, this feature is considered sensitive due to its alignment along Fault 3.

F-55 SOLUTION-ENLARGED FRACTURES



Description:

The feature consists of a series of narrow-aperture solution-enlarged fractures located in the exposed bedrock in a drainage channel. The fractures trend between N35°E to N40°E. The feature was not excavated.

F-62a POTENTIAL SINKHOLE

Description:

Feature 62a is a potential sinkhole measuring approximately 30 feet in diameter by 1 foot deep and is lined with soil and wetland type vegetation. The feature is located outside of the TxDOT ROW; therefore this feature has not been excavated. (ACI Feature No. 2633)

F-64 CAVE

Pre-excavation Description:

The feature was originally investigated as a potential sinkhole that measures approximately 1 foot in diameter by 1 foot deep and is partially rimmed by exposed bedrock. During the hand excavation process, the feature was determined to be a cave. (ACI Feature No. 2662)

Post-excavation Description:

The feature is a dry cave with a portal that measures approximately 12 feet long by 5 feet wide by 2.5 feet deep. Passage ranges from about 8 inches to 2 feet high and the entire cave is filled with loose cobbles, silt, and leaf litter. Excavation focused on tunneling to the east and to the north/northeast; which is towards F65. At the conclusion of excavation, passages extend 16 feet to the north/northeast and 20' to the east. The area in between these two passages, to the north, west, and south are also completely filled with cobbles and loose soil. However, time did not permit further excavation. From current excavation efforts, it is estimated that the interior dimensions of the cave should extend approximately 30 feet in diameter. One vertical crack was exposed in the north/northeast passage, into which rubble was tumbled approximately one foot before coming to rest. This suggests a vertical element to the cave in addition to the obvious horizontal extent. The depth of the cave is unknown, however, no damp/humid habitat was encountered. This feature has a high probability of extending into the F-65, which is also a cave. A map of this feature is provided in Figure 12.

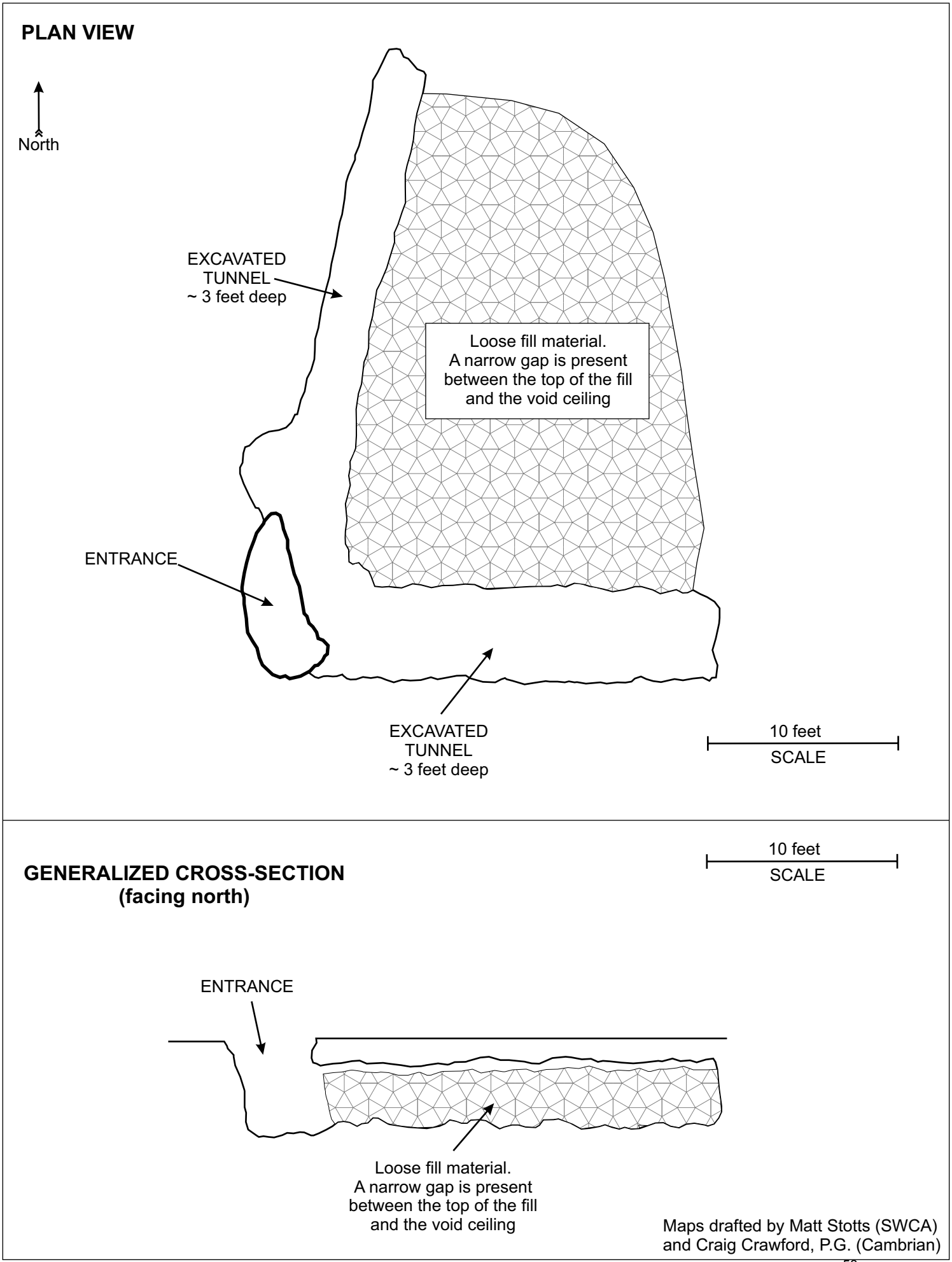


Figure 12. Plan view and cross-section of feature F-64.

F-65 CAVE

Pre-excavation Description:

The feature consists of a cave with an entrance pit that measures approximately 3 feet long by 1.5 feet wide by 4 feet deep. The rim of the entrance is entirely rimmed with limestone bedrock with some cobble, soil and organic debris infill. The full extent of the cave is not known at this time; however the cave will be surveyed and mapped during a later stage of field work. (ACI Feature No. 2885)

Post-excavation Description:

F-65 was the only open cave located within the right of way at the onset of the karst investigation. The entrance passage drops vertically for approximately 4 feet before opening to the southwest to a low wide room measuring approximately 40 feet in diameter. Along the southeastern edge of this room is a drain which, as a result of manual excavation, drops to a total depth of approximately 12 feet below the surface. An open portal measuring approximately 6 inches in diameter extends from the base of the drain for an unknown distance and exhibits consistent air flow. The drain and the entrance passage are aligned with a northeast-to-southwest trending fracture set that connects F-64 and F-65. A map of this feature is provided in Figures 13a and 13b.

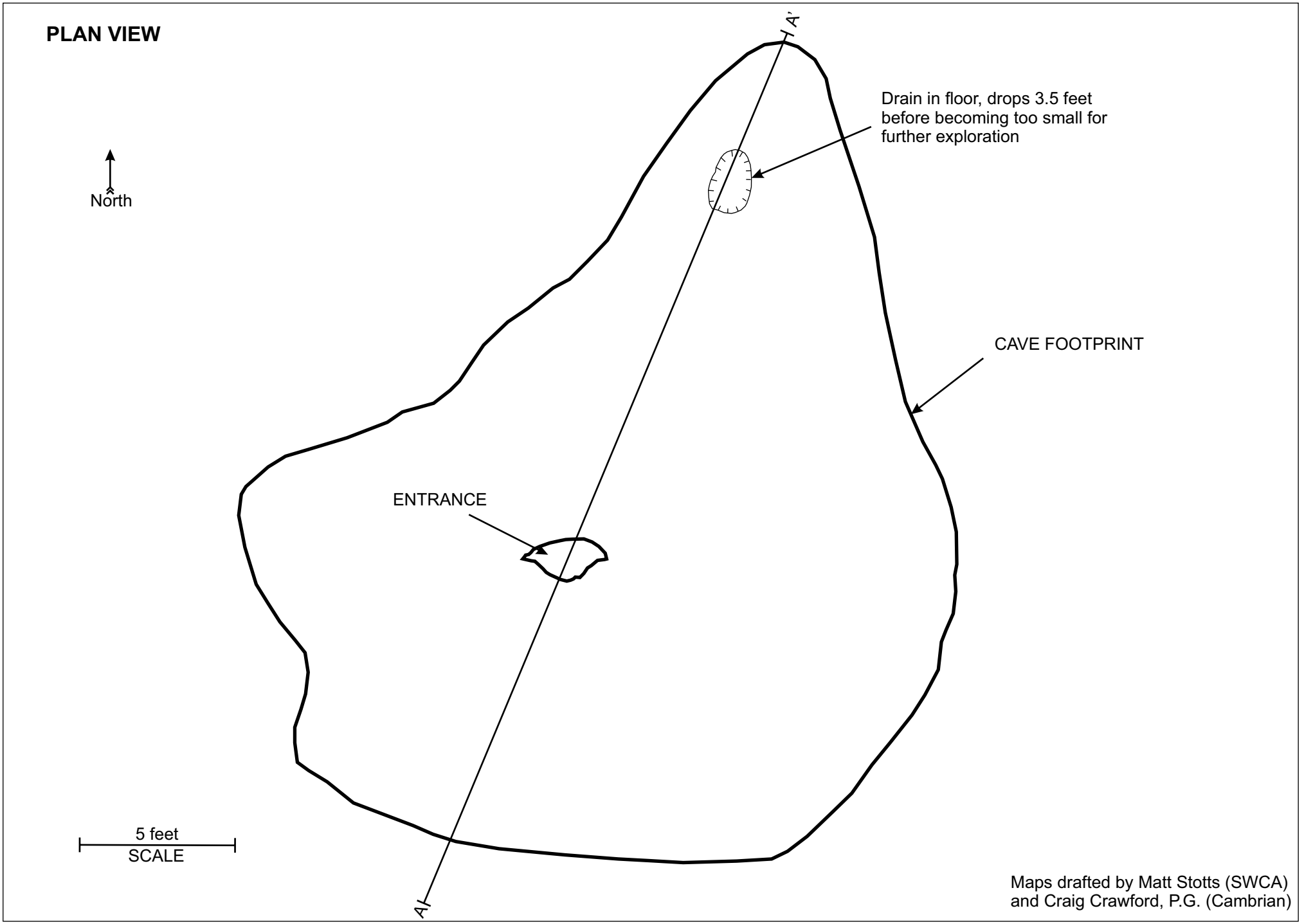
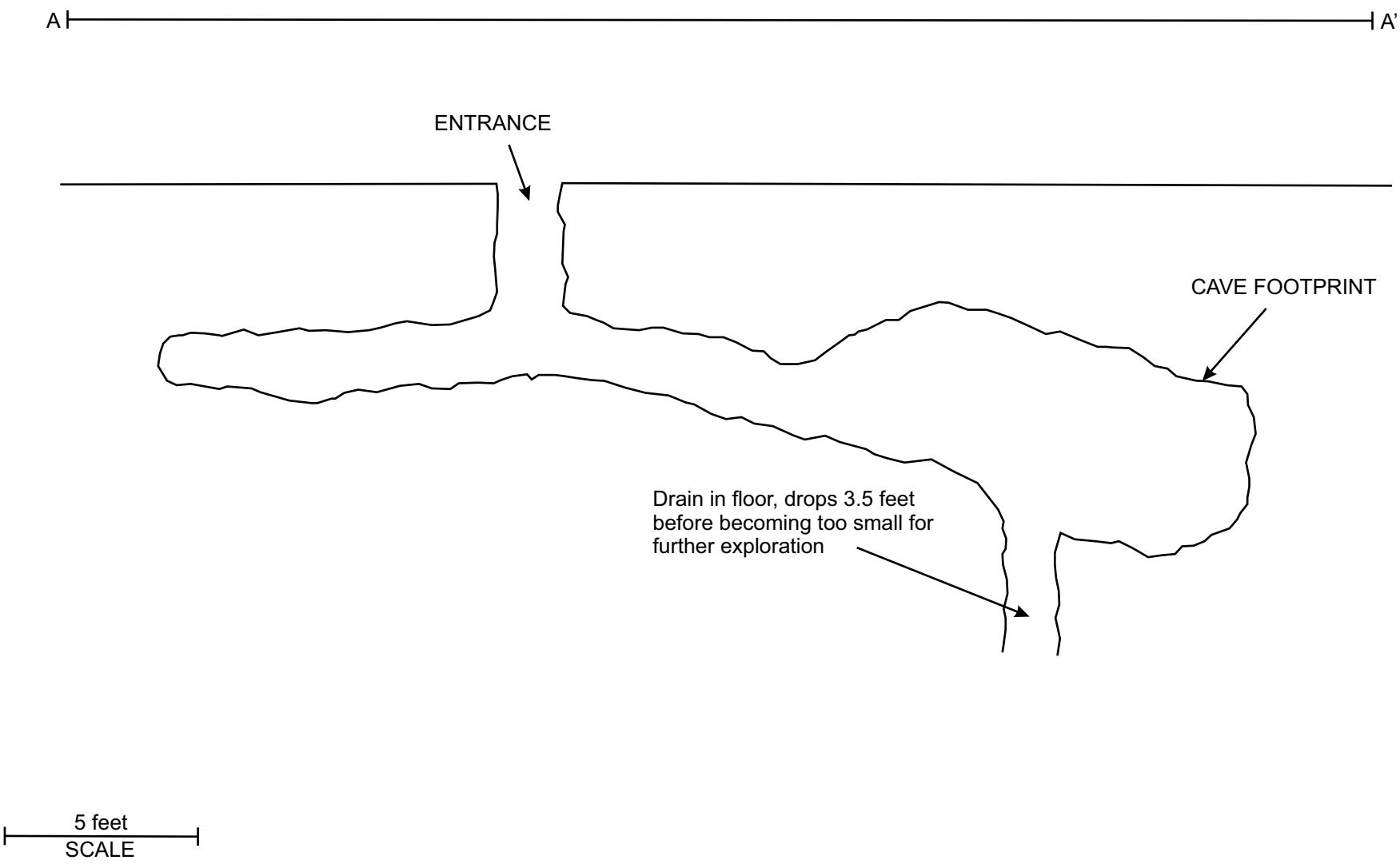


Figure 13a. Plan view of feature F-65 (Unnamed Cave).

CROSS-SECTION



Maps drafted by Matt Stotts (SWCA)
and Craig Crawford, P.G. (Cambrian)

Figure 13b. Cross-section of feature F-65 (Unnamed Cave).

F-110 CAVE / JUBILEE SINK

Pre-excavation Description:

The feature consists of a sinkhole measuring approximately 30 feet in diameter by at least 3 feet deep. The sinkhole has large trees growing along the rim and is filled with large limestone boulders, soil, and organic debris. (ACI Feature No. 2694)

Post-excavation Description:

Backhoe excavation of the feature formerly known as Jubilee Sink has produced a fracture-controlled pit measuring approximately 12 feet long by 4 feet wide and 8 feet deep. From the base of that pit manual excavation produced a narrow fracture-controlled passage which corkscrews to the southwest dropping vertically to a depth of approximately 20 feet below the surface. Fracture-oriented fissures in the bedrock extend below this point for an unknown distance and exhibit consistent air flow. A map of this feature is provided in Figure 14.

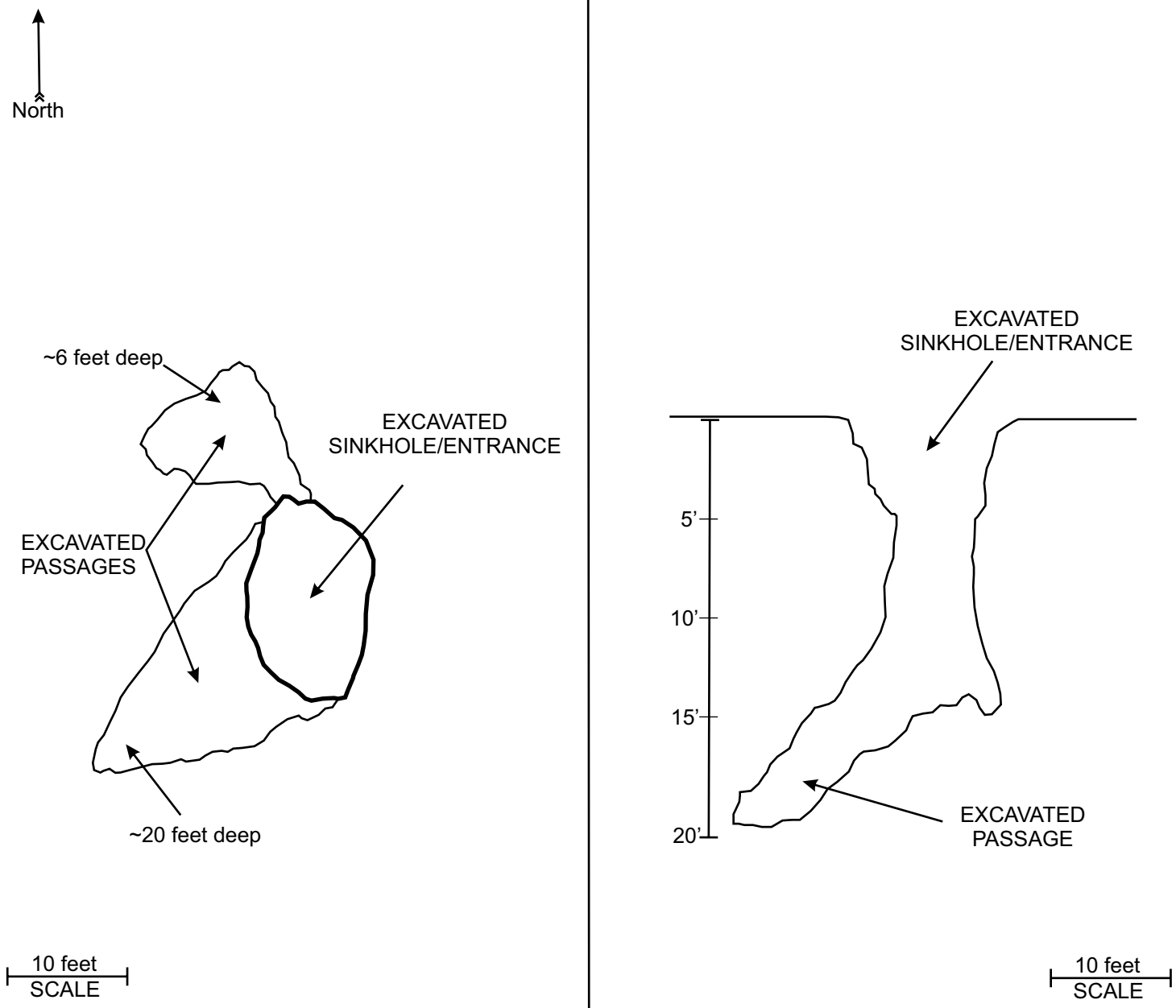


Figure 14. Plan view and cross-section of Jubilee Cave (feature F-110).

F-157a CAVE – SH45 CAVE

Description:

The feature is a named cave and was covered with wooden slats and a metal cage to prevent people and animals from falling in. The aperture is approximately 5 feet long by 4 feet wide and leads to a vertical shaft approximately 8 feet deep. A tunnel extension leading to the east measures approximately 3 feet wide by 1 foot tall and extends 20 feet while sloping towards a large void. This feature was not excavated because of its location relative to anticipated project construction location. A map of this feature is provided in Figure 15.

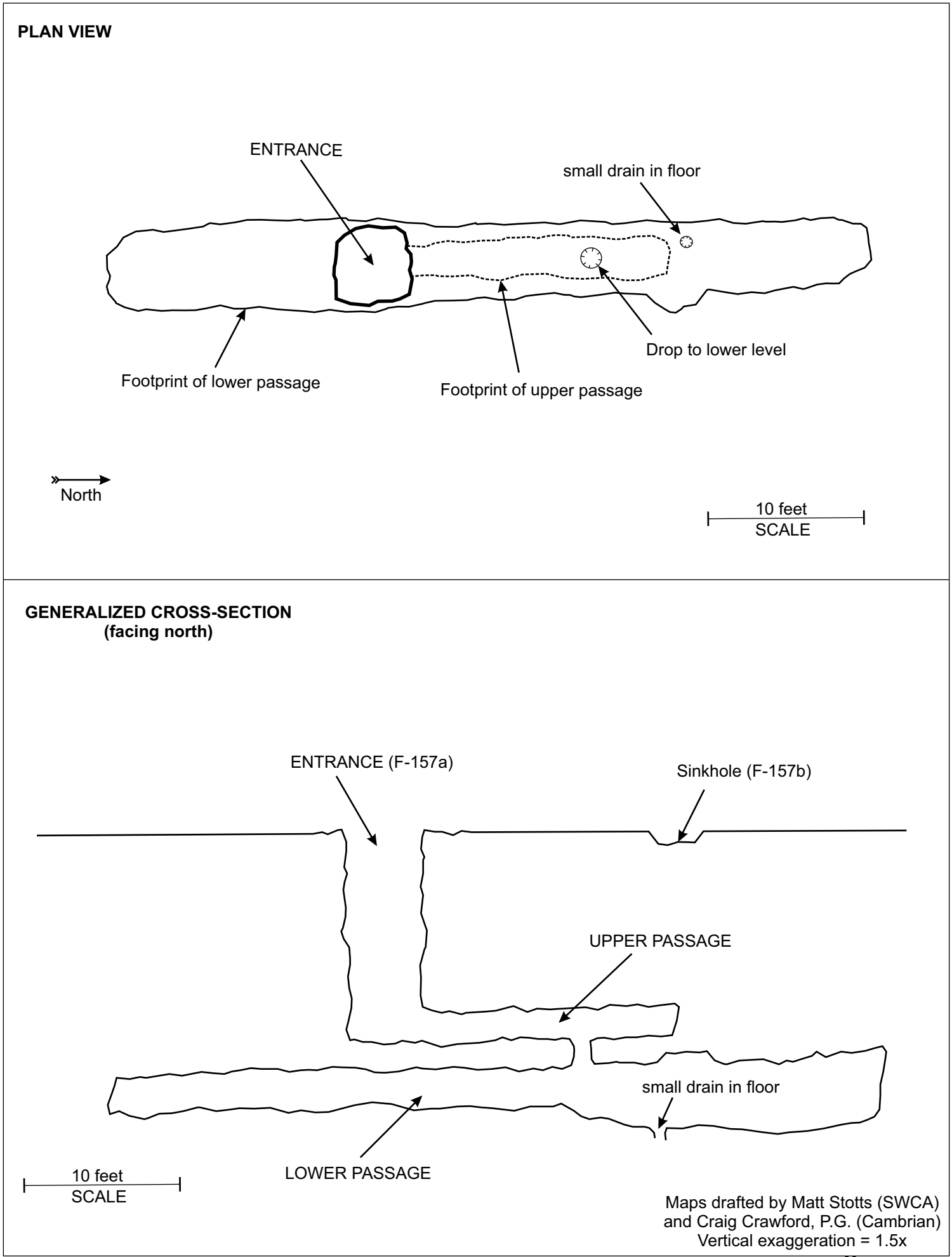


Figure 15. Plan view and cross-section of SH 45 Cave (feature F-157a).

F-157b CAVE

Description:

The feature aperture measures 5 feet long by 3 feet wide by 6 feet deep. The vertical shaft is filled with large limestone slabs and some organic debris. The close proximity to F-157a increases the probability that the features are linked to the same subterranean feature. This feature was not excavated because of its location relative to anticipated project construction location.

F-161 FAULT RELATED FRACTURE

Description:

The feature is an area of exposed, fractured bedrock within a dry stream channel. It appears that feature Fault 1 is expressed here with two fracture sets trending at 10° and 40°. Excavation in this location is not required.

F-163 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a solution cavity with an aperture measuring 6 inches in diameter that appears to extend approximately 1 foot deep. This feature is completely encased in limestone and has a small cedar elm growing immediately adjacent to it.

Post-excavation Description:

This feature was originally noted as a solution cavity in solid limestone with a diameter of approximately 6 inches. Excavation crews found an adjacent void that could be excavated with hand tools and discovered that there was a limestone bridge between the excavated void and the solution cavity. A jackhammer was used to collapse the bridge and widen the solution cavity to allow further access to excavation crews. The current feature measures 2 feet long by 1.5 feet wide by 4 feet deep. The infill consists of dark brown clay loam mixed with limestone cobbles.

F-170 SINKHOLE – MOPAC SINK

Description:

This named feature measures approximately 100 feet in diameter and slumps down approximately 1 foot. It is an extensive feature that is full of large limestone slabs, large trees (oak, persimmon, cedar elm, etc.) and organic debris. This feature was not excavated because of its location relative to anticipated project construction location.

KARST FEATURES: NON-SENSITIVE

F-8a SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a closed depression measuring approximately 4.5 feet long by 3 feet wide by 6 inches deep. The feature is lined with organic debris and leaf litter and appears to have been modified by the actions of burrowing mammals. (ACI Feature No. 2871)

Post-excavation Description:

The excavated feature consists of a small solution cavity at the base of the excavated depression that measures approximately 4.5 feet long by 3 feet wide by 3 feet deep. Excavation activities removed approximately 6 inches of loam prior to finding red clay and limestone cobble infill, which comprised the remainder of the excavation material. A small solution cavity was uncovered and measures approximately 1 foot long by 4 inches wide. The solution cavity is narrow and plugged with hard packed red clay.

F-22a SOLUTION CAVITY

Pre-excavation Description:

The feature was originally identified as a potential sinkhole measuring approximately 4 feet long by 2 feet wide by 1 foot deep, however it was subsequently determined to be a solution cavity. The feature is lined with soil and limestone cobbles. The feature appears to have opened up since the ACI survey (soil sapping or migration), and does not appear to be the result of the actions of burrowing mammals (no dig mound present). Feature F-22a is synonymous with ACI Feature No. 2881. About 60 feet away (at 110°) there is another small depression (F-22b) measuring approximately 1 foot in diameter by 6 inches deep.

Post-excavation Description:

This feature measures 7 feet long by 5 feet wide by 8 feet deep. Early on, excavation crews found an adjacent void that could be excavated with hand tools and discovered that there was a limestone bridge between the excavated void and the solution cavity. A jackhammer was used to collapse the bridge and widen the solution cavity to allow further access to excavation crews. The infill consists of dark brown clay loam mixed with limestone cobbles. Excavation ceased when it became apparent that this feature was not likely to immediately lead to any large karst voids. Cave crickets (*Ceuthophilus secretus*) were noticed at this feature in the early stages of excavation.

F-32 SOLUTION CAVITY

Pre-excavation Description:

The feature was originally investigated as a potential sinkhole measuring approximately 7 feet in diameter by 2.5 feet deep, however it was subsequently determined to be a solution cavity. The feature is partially rimmed by limestone, and is lined with soil and limestone cobbles. The feature appears to have been further modified by the actions of burrowing mammals. (ACI Feature No. 2537)

Post-excavation Description:

An area approximately 6 feet in diameter was excavated by hand and revealed two solution cavities. Hand excavation became infeasible as depth increased and the features became too narrow to access. A hoe ram and backhoe were used by TxDOT to allow further access into the ground. These activities collapsed the limestone bridge that separated the solution cavities to reveal a clay plugged feature that measures 6 feet long by 5 feet wide by 4.5 feet deep. No further signs of karst extent were revealed, therefore hand excavation of the feature did not resume.

F-33 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a closed depression measuring approximately 3.5 feet long by 2 feet wide by 4 inches deep. The feature is lined with soil, and assorted grasses and forbs.

Post-excavation Description:

The feature consists of a solution cavity that is entirely rimmed by bedrock. The solution cavity was uncovered at a depth of about 2.5 feet. The solution cavity measures approximately 1.5 feet long by 1 foot wide and appears to extend 1.5 feet down. Excavation ceased when the use of hand tools was no longer feasible. The solution cavity pinches off very rapidly and does not likely lead to a larger recharge feature; therefore further investigation did not occur on this feature.

F-34 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a pair of adjacent closed depressions measuring approximately a) 3 feet in diameter by 6 inches deep and b) 1 foot in diameter by 6 inches deep. The smaller depression appears to be a stump hole. The depressions are lined with soil, and assorted grasses and forbs.

Post-excavation Description:

Initial excavation efforts revealed this feature to be a solution cavity. Hand excavation became infeasible as depth increased and the feature became too narrow to access. A hoe ram and backhoe were used by TxDOT to allow further access into the ground. These activities left a feature that measures 5 feet long by 4 feet wide by 3 feet deep. Bedrock was reached with the machinery and no further signs of karst extent were revealed; therefore, hand excavation of the feature did not resume.

F-54 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a series of three adjacent solution cavities in a vuggy rock outcrop. The solution cavities of each of the three features measure approximately a) 6 inches long by 3 inches wide by 1 foot deep, b) 3 inches in diameter by 1 foot deep and c) 10 inches long by 6 inches wide by 1 foot deep.

Post-excavation Description:

The excavated feature reveals a solution cavity within a limestone float slab that measures 4 feet long by 3 feet wide by 1.5 feet deep. Excavation ceased when it became apparent that no further extent into the bedrock was apparent.

F-59a/b SOLUTION CAVITIES

Pre-excavation Description:

Feature 59a is a solution cavity measuring approximately 18 inches in diameter by less than a foot deep, is lined with leaf litter and soil, and is partially rimmed by limestone along one side of the portal.

Pre-excavation Description:

Feature 59b measures approximately 3 feet in diameter by 6 inches deep and is lined with organic debris and soil.

Post-excavation Description:

An area approximately 6 feet in diameter was excavated by hand and revealed two solution cavities. Hand excavation became infeasible as depth increased and the features became too narrow to access. A hoe ram and backhoe were utilized by TxDOT to allow further access into the ground. These activities collapsed the limestone bridge that separated the solution cavities. Hand excavation revealed a clay plugged feature that measures 6 feet long by 4 feet wide by 4 feet deep. No further signs of karst extent were revealed, and hand excavation of the feature was halted when a bedrock floor was encountered.

F-61 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a small closed depression measuring approximately 6 feet long by 4 feet wide by 2 feet deep. The feature was partially obscured with leaf litter and organic debris at the time of the pedestrian survey. (ACI Feature No. 2619)

Post-excavation Description:

Initial excavation efforts revealed this feature to be a solution cavity. Hand excavation became infeasible as depth increased and the feature became too narrow to access. A hoe ram and backhoe were used by TxDOT to allow further access into the ground. These activities left a feature that measures 5 feet long by 4 feet wide by 3.5 feet deep. Bedrock was reached with the machinery. Additional hand excavation showed no further signs of karst extent, therefore excavation ceased.

F-72 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a closed depression measuring approximately 15 feet long by 8 feet wide by 6 inches deep and is lined with organic debris and soil.

Post-excavation Description:

Excavation revealed a solution cavity that measures 1.5 feet long by 10 inches wide by 1.5 feet deep. The infill was comprised of clayey soil near the surface which transitions to red clay with depth. Limestone cobbles were present throughout the infill. Excavation ceased at bedrock.

F-136 SOLUTION CAVITY

Pre-excavation Description:

The feature consists of a small solution cavity with a surface expression that was covered by grass and prickly pear cactus. The feature has a partial limestone rim. Diameter is approximately 1 foot, and depth is about 4 inches. This feature is lined with organic debris, consisting mainly of leaf litter and soil. There are no trees in the immediate vicinity.

Post-excavation Description:

Hand excavation efforts originally revealed a circular solution cavity approximately 1 foot in diameter and excavation efforts ceased when hand digging was no longer feasible. A TxDOT authorized hoe ram was able to break up the limestone rim of the feature which allowed hand digging crews to excavate a feature that measured 5.5 feet long by 4.5 feet wide by 7 feet deep. Excavation ceased when it became apparent that this feature was not likely to immediately lead to any large karst voids.

NON-KARST, NON-SENSITIVE FEATURES

F-1 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 6 feet long by 4 feet wide by a maximum depth of 1 foot. The feature is partially rimmed by fractured limestone (fracture trend of N40°E) and small roots were observed to be penetrating the fractures. The depression is lined with organic debris and leaf litter. The feature is located on the south bank of a shallow drainage and may be the result of surficial weathering processes. (ACI Feature No. 2878)

Post-excavation Description:

After excavation, the feature consists of a non-karst closed depression measuring approximately 7 feet long by 5 feet wide by a maximum depth of 2.5 feet. Prior to excavation, the feature was partially rimmed by fractured limestone (fracture trend of N40°E) and small roots were observed to be penetrating the fractures. The depression was lined with organic debris and leaf litter, which transitioned to dark soil and small limestone cobbles. The feature is located on the south bank of a shallow drainage and appears to be the result of an erosional gouge on the bank of a drainage channel. Cave crickets (*Ceuthophilus secretus*) were observed at the feature during the excavation process. Excavation of the feature ceased when bedrock was encountered.

F-2 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3.5 feet long by 3 feet wide by 4 inches deep. The feature is lined with soil, leaf litter, and assorted forbs and grasses.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4.5 feet long by 3 feet wide by 3.5 feet deep. The top 6 inches consisted of light brown clay loam, which transitioned to red clay and limestone cobbles. Excavation of the feature ceased when bedrock was encountered.

F-3 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2.75 feet long by 2 feet wide by 10 inches deep. The feature appears to have been modified by the actions of burrowing mammals as a dig mound was present on the north side of the feature. At the time of the survey, the feature was obscured by flood debris (branches, tree limbs, leaf litter) from a recent precipitation event.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 6 feet long by 4 feet wide by 3.5 feet deep. The top 16 inches of fill consist of brown loam, the middle layer (approximately 16-24 inches deep) consist of red clay mixed with gravel, and the bottom layer (24-43 inches deep) consists of homogenous red clay with no gravel. This feature is adjacent to a local drainage and the infill appears to be consistent with repeated deposits related to runoff events. There does not appear to be a karst recharge feature associated in this location, and excavation ceased at 3.5 feet deep.

F-4 NON-KARST CLOSED DEPRESSION

Description:

The feature consists of a non-karst closed depression measuring approximately 23 feet long by 12 feet wide by 1.5 feet deep and appears to be a low wash-out within a shallow, cobble-filled upland drainage channel. Excavation was not initiated on this feature, and after a large rain event the feature was observed to be holding water (see picture below). Since the feature did not drain rapidly, it is not likely a discrete recharge point.

F-5 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet long by 1 foot wide by 1 foot deep. The feature is lined with soil and organic debris. The feature appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4.5 feet long by 4 foot wide by 4 foot deep. The top 6 inches consists of loam and the remainder of the infill was red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-6 NON-KARST CLOSED DEPRESSION

Description:

The feature appears to be the result of soil and gravel backfill slumping in and around an existing sewer line, therefore no excavation was conducted. The picture shows the linear nature of depression as it trends west, towards the camera and away from the SWCA karst technician who is standing on an existing sewer manhole.

F-7 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 8 inches deep. The feature is lined with soil and assorted grasses and forbs and appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4 feet long by 4 feet wide by 2 feet deep. The infill consists mainly of red clay and limestone slabs. Excavation ceased when bedrock was encountered.

F-8b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 8 feet long by 4.5 feet wide by 6 inches deep. The feature is lined with organic debris, loose soil and is directly adjacent to a dead juniper tree which is potentially indicative of a stump hole. A moderately sized hackberry is also directly adjacent to the feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4.5 feet long by 3 feet wide by 2.5 feet deep. The feature was filled with dark loam in the top 2 feet, followed by red clay and limestone cobbles for the base. Excavation ceased when bedrock was encountered.

F-9 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3.5 feet long by 3 feet wide by 6 inches deep and is lined with soil, leaf litter, and assorted grasses and forbs. An expired tree stump is present within the depression; the expression of the feature may be attributed to soil settling around the stump.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 3 feet long by 3 feet wide by 2.5 feet deep. Fill material in the feature consists of loamy soil and cobbles, and excavation ceased when bedrock was encountered.

F-10 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4.5 feet long by 2.5 feet wide by 8 inches deep. The feature is lined with soil, assorted grasses and forbs, and leaf litter. The feature may be a stump hole or the result of an expired tree, and the expression of the feature may be attributed to soil settling around the stump.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 2 feet long by 2 feet wide by 1.5 feet deep. The top 4 inches of infill consists of brown, loamy soil before transitioning to red clay. Excavation ceased when bedrock was encountered.

F-11 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot long by 8 inches wide by 10 inches deep. The feature is lined with soil and tree roots from an adjacent oak tree and has been further modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 5 feet long by 1.5 feet wide by 2 feet deep. The top 12 inches of infill consists of a brown loam, while the remainder of the infill consists of a red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-12 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 1.5 feet deep. The feature is lined with soil and organic debris. The feature appears to have been modified by the actions of burrowing mammals. (ACI Feature No. 2863)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 3 feet long by 3 feet wide by 4 feet deep. The feature was entirely filled with red clay soil and small limestone cobbles. Excavation ceased when bedrock was encountered.

F-13 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1.5 feet in diameter by 1 foot deep. The feature is mostly lined with soil and organic debris, with a few limestone cobbles and a large root from an adjacent oak tree. The feature appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 2 feet deep. The top 1 foot consists of brown loamy soil, and the remainder of the infill consists of red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-14 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature is lined by soil and organic debris and appears to have been modified by the actions of burrowing mammals. (ACI Feature No. 2518)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 3 feet by 2 feet by 1.5 feet deep. The top 1 foot of infill consists of brown loamy soil and the remaining 6 inches consists of red clay. Excavation ceased when bedrock was encountered.

F-15 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2.5 feet long by 1.5 feet wide by 1 foot deep. The feature is lined with soil and organic debris. The feature appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non karst closed depression that measures 4 feet long by 3 feet wide by 4 feet deep. The top foot of infill was dark loam, which transitions to large limestone slabs mixed with red clay for the remainder of the feature. The eastern floor appears to be bedrock while the northwestern floor appears to extend further down. Excavation ceased because of safety concerns regarding the depth of the feature and the unstable nature of the limestone slabs. The feature does not appear to be of karst origin, and no karst extensions were observed.

F-17 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet long by 1 foot wide by 1 foot deep and is lined with soil and organic debris. The feature is located between what appears to be two float slabs of limestone. The feature may be the result of tree roots uplifting the float slabs, and does not appear to be a solution-enlarged fracture. (ACI Feature No. 2504)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 7 feet by 5 feet by 2 feet deep. The infill consists of brown loamy soil mixed with large slabs of limestone. A large section of vuggy bedrock was exposed and excavation ceased when bedrock was encountered.

F-19a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 1.5 feet long by 1 foot wide by 1 foot deep. This feature is lined with soil and organic debris. (ACI Feature No. 2521)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 6.5 feet long by 4 feet wide by 4 feet deep. The infill consists of red brown loam mixed with chert cobbles and calcite. This feature did not show signs of karst formation.

F-19b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 2 feet in diameter by 6 inches deep. This feature is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4 feet by 3.5 feet by 2.5 feet deep. The infill consists of brown loam mixed with limestone cobbles. Excavation ceased when bedrock was encountered. This feature was noted to hold water for a few days after periods of heavy rain; therefore it is not a likely recharge feature. The picture was taken after several heavy rain events and soil from the surrounding area washed back into the excavated feature.

F-19c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 1.5 feet long by 1 foot wide by 1 foot deep. This feature is lined with soil and organic debris. (ACI Feature No. 2522)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4.5 feet in diameter by 5.5 feet deep. The infill consists of red brown loam mixed with chert cobbles; except for the last 1 foot which consists of brown clay that was mixed with cobbles. This feature did not show signs of karst formation. Excavation ceased when it became too dangerous for SWCA hand digging crews to continue.

F-20 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 8 inches deep. The feature is lined with soil and organic debris. The feature appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 2.5 feet deep. The infill consists of reddish clay mixed with limestone cobbles and limestone slabs. Excavation ceased when bedrock was encountered.

F-21 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1.5 feet long by 1 foot wide by 1 foot deep. The feature is lined with soil and organic debris. The feature appears to have been modified by the actions of burrowing mammals as a dig mound was present at the time of the survey. (ACI Feature No. 2523)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately by 3.5 feet in diameter by 3 feet deep. The infill consists of homogenous red clay. Excavation ceased when bedrock was encountered.

F-22b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 6 inches deep. The feature is lined with clay, grass and forbs.

F-22b NON-KARST CLOSED DEPRESSION

The excavated feature consists of a non-karst closed depression measuring approximately by 2 feet in diameter by 1 foot deep. The infill consists of homogenous red clay. Excavation ceased when bedrock was encountered.

F-24 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a small closed depression measuring approximately 8 inches long by 6 inches wide by 4 inches deep. The feature is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately by 4.5 feet in diameter by 4.5 feet deep. The infill consists of dense red clay mixed with fist-sized limestone cobbles. Some pieces of calcite were discovered and excavation ceased when bedrock was encountered.

F-25 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet long by 1 foot wide by 1 foot deep. The feature is lined with soil and is located at the edge of a limestone float slab.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 5 feet long by 4 feet wide by 1 foot deep. Infill was comprised entirely of dark brown loamy soil, with large slabs of limestone float. Excavation ceased when bedrock was encountered.

F-26 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet long by 3.5 feet wide by 6 inches deep. The feature is lined with soil and limestone cobbles. (ACI Feature No. 2527)

Post-excavation Description:

A pair of adjacent features were excavated and both are non-karst closed depressions. Approximately 6 to 12 inches of brown loam was removed to reveal the limestone bedrock. Excavation ceased when bedrock was encountered.

F-27a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 7 feet in diameter by 1 foot deep. It is lined with soil and organic debris. (ACI Feature No. 2530)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 5 feet by 4 feet by 3 feet deep. The top 1 foot of infill was comprised of dark loamy soil, and the subsequent 2 feet consists of red clay and limestone cobbles. Excavation ceased when bedrock was encountered.

F-27b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 8 feet long by 3.5 feet wide by 1 foot deep. It is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 2 feet deep. The top 1 foot of infill was comprised of dark loamy soil, with the next 1 foot consisting of red clay and limestone cobbles. Excavation ceased when bedrock was encountered.

F-27c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 1 foot deep. It is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 2 feet deep. The top 1 foot of infill was comprised of dark loamy soil, with the next 1 foot consisting of red clay and limestone cobbles. Excavation ceased when bedrock was encountered.

F-28 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 1.5 feet wide by 1 foot deep and is lined with soil. The feature appears to have been modified by the actions of burrowing mammals as a large dig mound is present. (ACI Feature No. 2531)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately by 5 feet long by 3 feet long by 3 feet deep. The infill consists of red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-29a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 3 feet long by 2 feet wide by 8 inches deep. The feature is lined with leaf litter, tree roots, limestone cobbles, and soil.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that has a diameter of 4 feet and a depth of 4 feet. The infill consists almost entirely of a red clay and limestone cobble mix. Excavation ceased when bedrock was encountered.

F-30 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 7 feet in diameter by 10 inches deep. The feature is lined with soil and may be a stump hole, or the result of an expired tree.

Post-excavation Description:

Two areas within the 7-foot diameter depression were investigated. The first excavation within the depression measured approximately 3 feet in diameter by 1.5 feet deep and the infill consists of dark brown loam in the upper 6 inches, and the rest was red clay with limestone cobbles. The second area investigated (lower picture) was similarly excavated and was found to have the same soil profile. Excavation of both areas ceased when bedrock was encountered.

F-31 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature is lined with soil and organic debris. The feature appears to have been further modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression measuring approximately 4 feet long by 2 feet wide by 1.5 feet deep. The top 6 inches of infill consists of brown loam and the rest was comprised of red clay and limestone cobbles. Excavation ceased when bedrock was encountered.

F-35 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 26 feet long by 15 feet wide by 1 foot deep. The feature is lined with soil and assorted grasses and forbs. The soil appears to be relatively thick in the vicinity of the feature, and the expression may be due to subtle micro-topography variations.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 8 feet long by 5 feet wide by 1 foot deep. The infill consists of dark loam, and excavation ceased when bedrock was encountered.

F-36 NON-KARST CLOSED DEPRESSION

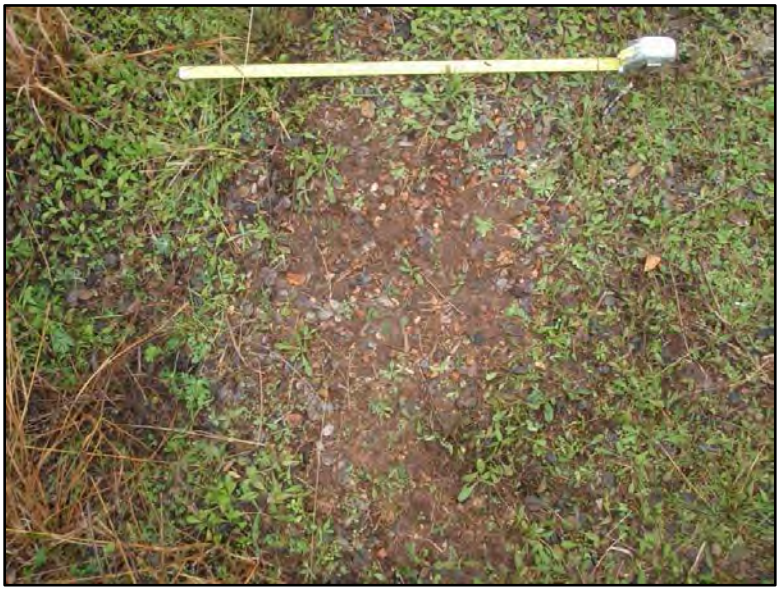
Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet long by 3 inches wide by 8 inches long. The feature may simply be a gap between two surface limestone float slabs. The feature appears to have been further modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature is a non-karst closed depression that has been further altered by the actions of burrowing mammals. The feature measures approximately 5 feet long by 4 feet wide by 2.5 feet deep. Excavation ceased when bedrock was encountered.

F-37 NON-KARST CLOSED DEPRESSION



Pre-excavation Description:

The feature consists of a depression that measures approximately 5 feet long by 3 feet wide by 8 inches deep. The depression is not "closed" and appears to have been excavated previously, as there appears to be a spoil pile adjacent to the depression. The feature is lined with soil and assorted grasses and forbs.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 5 feet long by 3 feet wide by 2.5 feet deep. The infill consists mainly of dark soil. Excavation ceased when limestone bedrock was encountered.

F-38 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet long by 3 feet wide by 10 inches deep. The feature is lined with soil and organic debris. The feature may be a stump hole, or the result of an expired tree. A small, dead cedar tree is lying on the ground directly adjacent to the feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 5 feet long by 3 feet wide by 2.5 feet deep. The top 1 foot of infill was loamy soil and the remainder of the infill was red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-39 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 1 foot deep. The feature is partially rimmed by limestone, and is lined with soil, limestone cobbles, and assorted grasses and forbs. (possible ACI feature No. 2540)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 6 feet long by 4.5 feet wide by 2.5 feet deep. Infill material was comprised of large limestone slabs, cobbles, and loamy soil mixed with red clay. Excavation ceased when bedrock was encountered.

F-40 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet in diameter by 1 foot deep. The feature is lined with soil, limestone cobbles, and assorted grasses and forbs.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 5 feet long by 3.5 feet wide by 1.5 feet deep. Several large slabs of limestone were removed, along with limestone cobbles and some dark brown loam. Excavation ceased when bedrock was encountered.

F-42a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 12 feet long by 4 feet wide by 6 inches deep. The feature is lined with soil and limestone cobbles. The feature may be attributed to a possible dozer scar, or a borrow pit related to ranch road maintenance.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 3 feet in diameter by 1.5 feet deep. The infill was comprised mostly of loamy soil mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-42b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2.5 feet wide by 9 inches deep. The feature is lined with grasses and forbs with a limestone rimrock encircling half of the feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 2 feet deep. Most of the infill was comprised of dark soil, but the bottom 6 inches was comprised of red clay and cobbles. Excavation ceased when bedrock was encountered.

F-43 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

An ACI marking hub (wooden stake with blue tassels) was found at this location, however it is unclear what feature was marked. An outcrop of limestone bedrock measuring approximately 23 feet long by 3 feet wide is present at this location, but no obvious depression, karst feature, or discrete recharge feature was observed by SWCA.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 4 feet in diameter by 2 feet deep. The infill was comprised entirely of dark soil and excavation ceased when bedrock was encountered.

F-44a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The consists of a non-karst closed depression that measures approximately 7 feet in diameter by 8 inches deep. It is lined with soil, limestone cobbles and assorted grasses and forbs.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5.5 feet long by 5 feet wide by 4 feet deep. The top 1.5 feet of infill was comprised of loamy soil; with the remainder being comprised of red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-44b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures approximately 4 feet in diameter by 8 inches deep. It is lined with soil, limestone cobbles and assorted grasses and forbs.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 4 feet wide by 2.5 feet deep. The top 1 foot of infill was comprised of loamy soil; with the remainder being red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-45 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 5 feet in diameter by 1.5 feet deep. The feature is lined with soil, limestone cobbles, and assorted grasses and forbs. The limestone slab present in the feature appears to have been uplifted by the roots of nearby trees. (ACI Feature No. 2556)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 6 feet in diameter by 4.5 feet deep. The top 1 foot was comprised of dark soil and the remainder of the infill was comprised of red clay and limestone cobbles. Cave crickets (*Ceuthophilus secretus*) were observed under one of the large limestone slabs removed during excavation. Excavation ceased when bedrock was encountered.

F-46 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet in diameter by 8 inches deep. There is a limestone slab in the middle of the depression and it is lined with organic debris and soil.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5.5 feet long by 4.5 feet wide by 3 feet deep. The top 2 feet of the infill was comprised of loamy soil, with the remaining infill turning to red clay with limestone cobbles. Excavation ceased when bedrock was encountered.

F-47a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep. The depression is likely the result of a stump hole and is lined by soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 3.5 feet long by 3 feet wide by 2 feet deep. Infill was entirely comprised of red clay and limestone cobbles. Excavation ceased when bedrock was encountered.

F-47b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 8 inches deep and is likely the result of a stump hole. This feature is lined by soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 1.5 feet deep. The top 8 inches of infill was comprised of brown clay loam that transitioned to red clay for the remainder of the feature. Excavation ceased when bedrock was encountered.

F-48 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet in diameter by 6 inches deep. The depression is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 4 feet long by 3.5 feet wide by 1.5 feet deep. Infill was comprised entirely of dark soil. Excavation ceased when bedrock was encountered.

F-49 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature appears to be an animal burrow below a limestone float slab.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet in diameter by 4 feet deep. The top two feet of infill is comprised of loamy soil, while the remaining infill consists of red clay, limestone cobbles and large limestone slabs. Excavation ceased when bedrock was encountered.

F-50 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 6 inches in diameter by 10 inches deep. The feature has a limestone rim and is lined with soil and organic debris.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 3 feet long by 2.5 feet wide by 2.5 feet deep. The infill was comprised mostly of dark soil and limestone cobbles mixed with roots. Excavation ceased when bedrock was encountered.

F-51 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a series of adjacent non-karst closed depressions that are likely related to the uplift of limestone slabs near the base of a large oak tree. There are several openings that are approximately 1.5 feet deep within a 20 foot diameter area. The feature is lined with soil, organic debris, and vegetation.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 2.5 feet wide by 1 foot deep. This feature consists largely of large limestone slabs, likely uplifted by tree roots. The infill also consists of dark clay loam. Excavation ceased when limestone bedrock was encountered.

F-52 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature appears to have been modified by the actions of burrowing mammals and is lined by organic debris and soil.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 4 feet long by 3 feet wide by 3 feet deep. The top 1 foot of infill was comprised of loamy soil, with the remainder consisting of red clay and limestone cobbles. This picture was taken after a large rain event and shows the feature holding water (i.e., not draining). Excavation ceased when bedrock was encountered.

F-53 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature is located beneath a limestone slab that has been uplifted by tree roots. The feature also appears to have been modified by the actions of burrowing mammals. (ACI Feature No. 2575)

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 3 feet long by 2.5 feet wide by 1.5 feet deep. A large limestone slab was capping the feature and cave crickets (*Cethophilus secretus*) were observed by the excavation crew. Dark soil comprised the top 6 inches of infill, which transitions to caliche and soft (weathered) limestone. Excavation ceased when limestone bedrock was encountered.

F-56 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet in diameter by 6 inches deep. This feature is lined with leaf litter and loose soil.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures approximately 4 feet long by 3 feet wide by 2.5 feet deep. The top 9 inches of infill was comprised of loamy soil which transitions to red clay and limestone cobbles for the rest of the feature. Excavation ceased when limestone bedrock was encountered.

F-57a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is s non-karst closed depression that measures approximately 40 feet in diameter by 1.5 feet deep. It is lined with soil and assorted grasses and forbs. (ACI Feature No. 2562)

Post-excavation Description:

The excavated feature is a non-karst closed depression and the excavated area measures 2.5 feet in diameter by 3 inches deep. The feature is located in a wide, ephemeral drainage and most of the overlying soil has eroded away. Excavation ceased when limestone bedrock was encountered.

F-57b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures approximately 8 feet long by 4 feet wide by 1 foot deep. It is lined with soil and assorted grasses and forbs.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 4 feet deep. The infill consists mainly of dark loam mixed with few limestone cobbles. This feature showed no signs of either recharge or of karst formation.

F-58a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 50 feet long by 39 feet wide by 1.5 feet deep. It is lined with clay and assorted forbs and grasses. A wetland plant (*Eleocharis* spp.) was also found growing at this location. (ACI Feature No. 2600)

Post-excavation Description:

The excavated feature was opened using a backhoe and is a non-karst closed depression that measures 30 feet deep by 20 feet wide by 7 feet deep. The infill consists mainly of very dense, dark clay that comprised the top 5 feet of the feature. Below this layer, the infill was either limestone bedrock or red clay mixed with large limestone cobbles. Excavation ceased when the backhoe could not safely dig any deeper and it became apparent that no karst features would be located.

F-58b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 16 feet in diameter by 1 foot deep. It is lined with clay and assorted forbs and grasses. (ACI Feature No. 2734)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 4 inches deep. The infill consists mainly of dark brown clay loam that comprised the entirety of the feature. Excavation ceased when bedrock was encountered.

F-59c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is non-karst closed depression that measures 4 feet in diameter by 6 inches deep. It is lined with soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in length by 3 feet wide by 1 foot deep. The infill consists of dark brown clay loam mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-59d NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is non-karst closed depression that measures 5 feet in diameter by 6 inches deep. It is lined with soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4.5 feet in length by 4 feet wide by 1 foot deep. The infill consists of dark brown clay loam mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-59e NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is non-karst closed depression that measures 6 feet in diameter by 6 inches deep. It is lined with soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1.5 feet deep. The infill consists of red clay mixed with limestone cobbles. Excavation ceased when bedrock was encountered.

F-60 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 6 inches deep. The depression is lined with soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2 feet deep. The infill consists mainly of dark brown clay loam mixed with limestone cobbles that comprised the entirety of the feature. Excavation ceased when bedrock was encountered.

F-62b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression measuring approximately 8 feet in diameter by 1 foot deep. It is lined with soil and assorted grasses and forbs.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet in diameter by 2.5 feet deep. The top 2 feet of infill consists of dark brown clay loam, while the last 6 inches is comprised of caliche, crumbled limestone and red clay. Excavation ceased when bedrock was encountered.

F-63a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures approximately 10 feet long by 6 feet wide by 1 foot deep and is lined with limestone cobbles and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet long by 2.5 wide by 2 feet deep. The top 1 foot of infill consists of dark brown loam, while the bottom half of the feature consists of red clay and decomposed limestone. Excavation ceased when bedrock was encountered.

F-63b CLOSED DEPRESSION

Description:

This feature is a closed depression that measures approximately 4 feet long by 4 feet wide by 6 inches deep. The feature is located outside of the TxDOT ROW on private property and therefore has not been excavated.

F-66 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep. The depression is lined with soil and assorted grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The top 6 inches of infill was comprised of loose, dark soil that transitions to red clay and limestone cobbles. Large pieces of secondary calcite were also pulled from this feature. Excavation ceased when limestone bedrock was encountered.

F-67a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 2 feet in diameter by 8 inches deep. It is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1 foot deep. The infill was completely comprised of dark soil and roots. Excavation ceased when limestone bedrock was encountered.

F-67b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures approximately 4 feet long by 3 feet wide by 6 inches deep. It is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet in diameter by 2 feet deep. The infill was comprised entirely of a gray, loamy soil mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-67c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature is a non-karst closed depression that measures 8 feet long by 4 feet wide by 6 inches deep. It is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 3.5 feet deep. The infill was comprised mainly of red clay and limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-68 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 6 inches deep. The depression is lined with limestone cobbles, soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 4 feet deep. The top 18 inches of infill was dark soil which transitions to red clay and limestone cobbles below. Excavation ceased when limestone bedrock was encountered.

F-69 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet long by 3 feet wide by 6 inches deep. The depression is lined with soil and organic debris, and is partially rimmed by limestone cobbles. (possible ACI Feature No. 2584)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 1.5 feet deep. The top 1 foot of infill was comprised of dark soil which transitions to red clay for the remainder of the feature's depth. Excavation ceased when limestone bedrock was encountered.

F-70 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 1 foot deep. The depression is lined with soil and organic debris, and is partially rimmed by limestone cobbles. (possible ACI Feature No. 2582)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 3.5 feet wide by 5 feet deep. The top 2 feet of infill was comprised of gray, loamy soil which transitions to red clay and limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-71 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2 feet long by 2 feet wide by 8 inches deep. The feature is lined with soil and organic debris and is partially rimmed by limestone cobbles.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 18 inches deep. The infill is comprised of a grayish-brown soil and clay mix. Excavation ceased when limestone bedrock was encountered.

F-73 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature is lined with soil and organic debris and appears to have been further modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 2.5 feet deep. The top two feet of infill was comprised of gray-brown clay that transitions to red clay in the lower 6 inches of the feature. Excavation ceased when limestone bedrock was encountered.

F-74 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 6 inches deep and is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 3 feet deep. The infill was comprised of brown clay loam mixed with large limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-75 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet long by 3 feet wide by 1 foot deep and is lined with organic debris and soil. The feature appears to be a stump hole with a decaying stump from an expired tree present in the depression.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 3 feet deep. The infill was comprised of dark brown clay loam mixed with small limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-76 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 1 foot deep and is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 3 feet deep and contained a dead trees stump. The infill was comprised of rotten wood and brown clay loam mixed with large limestone cobbles. The infill changes to large limestone slabs mixed with red clay near the bottom of the feature. Excavation ceased when limestone bedrock was encountered.

F-77 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 12 feet long by 8 feet wide by 6 inches deep and is lined with organic debris and soil.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long 2.5 feet wide by 10 inches deep. The infill was comprised entirely of dark loamy soil. Excavation ceased when limestone bedrock was encountered.

F-78 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 8 inches deep and is lined with organic debris and soil. The feature appears to be related to a stump hole with a decaying stump from an expired tree present in the depression.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet long by 2.5 feet wide by 1.5 feet deep. Dark colored, loamy soil comprised the top 9 to 12 inches of infill, while red clay and crumbling limestone comprised the remainder of the infill. Excavation ceased when limestone bedrock was encountered.

F-79 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 15 feet long by 7 feet wide by 8 inches deep and is lined with soil and vegetation. The feature appears to be manmade, possibly an excavation scar or borrow pit.

Post-excavation Description:

The excavated feature is a non-karst closed depression that was excavated with a backhoe and measured 10.5 feet long by 7 feet wide by 4.5 feet deep. The top half of infill was comprised of dense, dark clay that transitions to a lighter brown clay soil with few gravel inclusions. The bottom half of the infill is red clay mixed with increasingly larger sized limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-80 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter and 1.5 feet deep. The feature is lined with soil and organic debris and appears to have been further modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 2.5 feet deep. The top 2 feet of infill was comprised of dark brown clay loam that transitions to red clay mixed with deteriorating limestone in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-81 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 8 inches deep and is lined with soil. The feature appears to be manmade and may be associated with a piezometer cluster, rain gauge, and water collection pit nearby.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 1.5 feet deep. The top foot of infill was comprised of dark brown clay loam that transitions to red clay mixed with deteriorating limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered. This picture was taken after several heavy rain events and some soil from the surrounding area washed back into the excavated feature.

F-82a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 2 feet wide by 6 inches deep and is lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long 3 feet in width by 1 foot deep. The top half of infill was comprised of dark brown loam that transitions to red clay in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-82b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 5 inches deep. The feature is lined with clay and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 1.5 feet deep. The top half of infill was comprised of dark brown loam that transitions to red clay in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-83a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 8 feet long by 4 feet wide by 8 inches deep. This feature is lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2 feet long 3.5 feet wide by 1.5 feet deep. The top foot of infill was comprised of dark brown clay loam that transitions to red clay mixed with limestone cobbles in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-83b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet long by 1.5 feet wide by 8 inches deep. The feature is lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 2.75 feet deep. The top two feet of infill was comprised of dark brown clay loam that transitions to red clay mixed with limestone cobbles in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-83c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring 2 feet long by 2 feet wide by 4 inches deep. All features are lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 2.5 feet deep. The top two feet of infill was comprised of dark brown clay loam that transitions to red clay mixed with limestone cobbles in the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-84 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 1 foot deep. It is lined with soil, vegetation, and few limestone cobbles.

Post-excavation Description:

Hand excavation became infeasible as depth increased and the feature became too narrow to access. A hoe ram and backhoe were utilized by TxDOT to allow further access into the ground. These activities left a feature that measures 6 feet in diameter by 4.5 feet deep. The first foot of infill was dark clay loam that transitions to degraded limestone for the rest of the feature. Hand excavation resumed, however no signs of karst extent were revealed; therefore excavation efforts ceased.

F-85a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures approximately 5 feet long by 5 feet wide by 6 inches deep. It is lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 1 foot deep. The infill was comprised of dark clay loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-85b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures approximately 12 feet long by 8 feet wide by 6 inches deep. It is lined with soil and grasses.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet long by 2 feet wide by 1 foot deep. The infill was comprised of dark clay loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered. This picture was taken after several heavy rain events and soil from the surrounding area washed back into the excavated feature.

F-86 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. There is an expired juniper stump in the middle of the depression, so the feature is likely the result of the dead tree. The feature is lined by organic debris and vegetation.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 3 feet wide by 2.5 feet deep. The top foot of the infill was comprised of dark loam. The feature then transitions to red clay and limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-90 NON-KARST CLOSED DEPRESSION

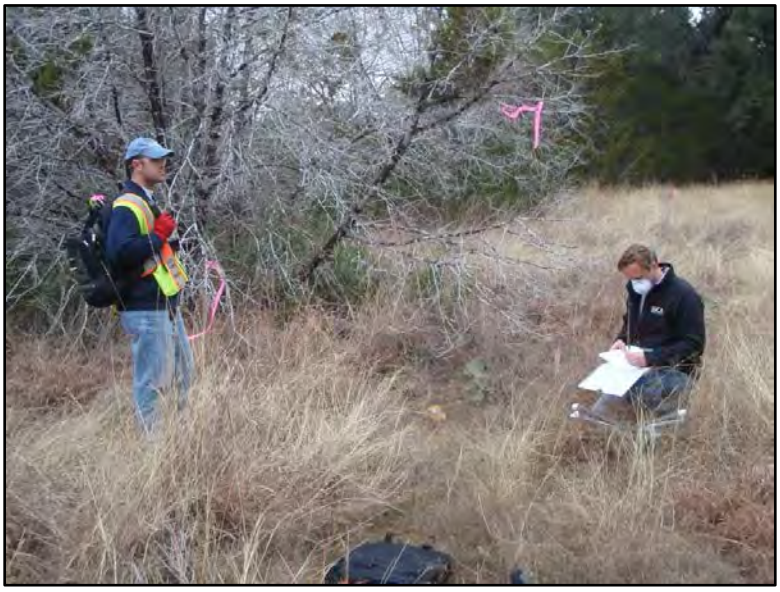
Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 12 feet long by 9 feet wide by 6 inches deep. The feature is lined with soil, there are calcite boulders (float) around the rim, and several expired tree stumps nearby.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 5 feet wide by 6 inches deep. The infill was comprised of dark loam and limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-91 NON-KARST CLOSED DEPRESSION



Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet in diameter by 8 inches deep. The feature is lined with soil and a small mound is present. The feature may be attributable to a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 3 feet wide by 1.5 feet deep. The infill was comprised of dark loam and limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-92a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression with dimensions of approximately 2 feet in diameter by 6 inches deep. The feature is lined with soil and is located near a ranch road. The depression may have been caused by road maintenance.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1.5 feet deep. The infill was comprised of dark loam and limestone cobbles that became caliche in the bottom 3 inches of the feature. Excavation ceased when limestone bedrock was encountered.

F-92b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression with dimensions of approximately 2 feet in diameter by 6 inches deep. The feature is lined with soil and is located near a ranch road. The depression may be attributed to past road maintenance activities.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1 foot deep. The infill was comprised of dark loam and limestone cobbles that became caliche in the bottom 3 inches of the feature. Excavation ceased when limestone bedrock was encountered.

F-93a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet in diameter by 1 foot deep. The feature is lined with soil and may be the result of the actions of burrowing mammals as a dig mound was present adjacent to the feature. (possible ACI Feature No. 2634)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 4 feet wide by 2.5 feet deep. The top 9 inches of infill was comprised of dark clay loam that transitions to a thin layer of red clay, which then transitions to caliche and decomposed limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered. Cave crickets (*Ceuthophilus secretus*.) were noted within this feature as crews began the initial excavation.

F-93b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression with dimensions of approximately 4 feet in diameter by 6 inches deep. The feature is lined with soil clay, grasses and is directly adjacent to a live juniper tree.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 1.5 feet deep. The top 10 inches of infill was comprised of dark clay loam and limestone cobbles that transition to degraded bedrock for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-94 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of an elongated non-karst closed depression at the base of a dead oak tree and measures approximately 10 feet long by 5 feet wide by 6 inches deep. The feature is lined with soil and has persimmon and grapevine growing out of it.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet long by 2 feet wide by 1 foot deep. The infill was comprised of dark brown clay mixed with some limestone gravels. Excavation ceased when limestone bedrock was encountered.

F-95a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The is a non-karst closed depression measuring approximately 4.5 feet by 3 feet by 1 foot deep. The feature is lined with grasses and forbs. The feature is also partially rimmed by limestone.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The infill was comprised of dark gray-brown clay loam matrix. Excavation ceased when limestone bedrock was encountered.

F-95b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression measures approximately 10 feet by 4 feet by 6 inches deep. This feature is lined with clay and grass. The feature is located at the base of a large dead oak and may be the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1.5 feet deep. The upper 8 inches of infill was comprised of dark gray-brown clay loam, which then transitions into red clay mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-96 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 10 feet by 5 feet by 1 foot deep. The feature is located in a cluster of depressions marked previously by ACI as No. 2625.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 3 feet wide by 2 feet deep. The infill was comprised of dark gray-brown clay loam with several large limestone slabs within the matrix. Excavation ceased when limestone bedrock was encountered.

F-97a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet in diameter by 6 inches deep. The depression is located in an area with relatively thick soil cover and near an area of recent bulldozing. (ACI Feature No. 2648)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet in diameter by 1 foot deep. The infill was comprised of dark gray-brown clay loam mixed with limestone gravel. Excavation ceased when limestone bedrock was encountered.

F-97b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet in diameter by 1 foot deep. The depression is located in an area with relatively thick soil cover. The area surrounding the feature appears to have been recently disturbed, possibly by machinery.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 1 foot deep. The infill was comprised of dark gray-brown clay loam mixed with limestone gravel. Excavation ceased when limestone bedrock was encountered.

F-98 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 6 feet by 4 feet by 1 foot deep and is lined with clay soil and dolomitic limestone cobbles. The depression is located near an area that appears to have been bulldozed.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 3.5 feet wide by 2 feet deep. The top half of the infill was comprised of clay loam mixed with limestone cobbles, which transitions to reddish clay mixed with degrading limestone. Excavation ceased when limestone bedrock was encountered.

F-99 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depresion measuring approximately 9 feet by 6 feet by 1.5 feet deep and is lined with loose soil and organic debris. The depression is located near a ranch road.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 8 feet long by 5 feet wide by 4 feet deep. The top half of the infill was comprised of clay loam mixed with limestone cobbles, which transitions to reddish clay mixed with degrading limestone. Approximately 10 limestone boulders were also removed from the feature. Excavation ceased when limestone bedrock was encountered.

F-100 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The depression is partially rimmed by limestone cobbles and is lined with soil and leaf litter.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4.5 feet long by 4 feet wide by 2.5 feet deep. The top 13 inches of the infill was comprised of gray-brown loam mixed with limestone cobbles; which transitions to approximately 5 inches of reddish brown clay. The final portion of the infill was comprised of degrading bedrock. Excavation ceased when limestone bedrock was encountered.

F-101 OTHER (LAND CLEARING DISTURBANCE)

Pre-excavation Description:

The feature consists of a disturbed area likely resulting from previous land clearing activities. A series of limestone boulders are scattered within an area that measures approximately 20 feet in diameter. Gaps between the boulders drop by 6 inches deep.

Post-excavation Description:

The area was determined to be the result of past bulldozing. Several rock slabs within the area were flipped with rock bars exposing no karst features. The most prominent depression within the area was excavated with a jackhammer to an approximate depth of 3 feet after a small solution cavity was located within a slab of what initially appeared to be bedrock. The solution cavity was enlarged to approximately 1 foot in diameter which exposed additional fill material below, and therefore the slab was determined to not be intact bedrock (see photo). Excavation continued but ceased at soft limestone bedrock.

F-102 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep. The feature is soil lined, with no exposed rock and appears to have been modified by the actions of burrowing mammals.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 3.5 feet deep. The top 20 inches of the infill was comprised of dark brown clay loam, which transitions to approximately 5 inches of red clay. The final portion of the infill was comprised of eroding bedrock. Excavation ceased when limestone bedrock was encountered.

F-103 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 6 inches deep. It is lined by soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 3.5 feet wide by 1.5 feet deep. The top half of the infill was comprised of dark clay loam, which transitions to red clay mixed with degraded limestone bedrock. Excavation ceased when limestone bedrock was encountered.

F-104 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression beneath a limestone boulder that measures approximately 3 feet in diameter by 1 foot deep. The feature appears to have been further modified by the actions of burrowing mammals. (possible ACI Feature No. 2654)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 2.5 feet deep. The top half of the infill was comprised of dark clay loam, which transitions to red clay mixed with degraded limestone bedrock. Large slabs of limestone were also mixed into the infill matrix. Excavation ceased when limestone bedrock was encountered.

F-105 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depresion measuring approximately 1 foot in diameter by 8 inches deep. The depression is lined with limestone cobbles and organic, rich soil. The feature may have formed by as the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 2.5 feet wide by 2 feet deep. The infill was comprised of gray-brown clay loam mixed with limestone gravel. Excavation ceased when limestone bedrock was encountered.

F-106 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1.5 feet deep and is developed in a silty/sandy substrate. The feature is located in the floodplain of Bear Creek and appears to have been further modified by the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet in diameter by 4.5 feet deep. The infill was comprised of alluvial sand and tree roots. Excavation ceased when limestone bedrock was encountered.

F-107 ROCK OUTCROP

Description:

The feature is a geologic formation and bedrock outcrop within Bear Creek and is possibly a reef mound structure that has been eroded to show concentric rings in the exposed beds. The mound measures approximately 40 feet by 25 feet by 2 feet high. The feature was not excavated.

F-108 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 6 inches deep. The feature is lined with soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4.5 feet long by 3.5 feet wide by 1.5 feet deep. The infill was comprised of dry loam mixed with limestone gravel and one large limestone slab. Excavation ceased when bedrock was encountered.

F-109 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 6 inches deep. The feature is lined with soil and organic debris and may be the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4.5 feet long by 3.5 feet wide by 3.5 feet deep. The first foot of infill was comprised of reddish brown clay loam mixed with limestone gravel. The remainder of the infill consists of large limestone boulders mixed with caliche. Excavation ceased when limestone bedrock was encountered.

F-111 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep. The feature has several pieces of flowstone cobble and contains a discrete drainage channel. It is also lined with loose soil and appears to have been altered by the actions of a burrowing mammal and root uplift.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 4.5 feet wide by 3 feet deep. The first foot of infill was comprised of dark brown clay loam mixed with limestone boulders. Excavation ceased when limestone bedrock was encountered.

F-112 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a depression between two float limestone boulders. The depression measures 2 feet in diameter and is lined with loose soil, organic debris and juniper trees. (possible ACI Feature No. 2699)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 1.5 feet deep. The infill was comprised of clay loam mixed with limestone boulders and tree roots. Excavation ceased when limestone bedrock was encountered.

F-113 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 4 feet by 2 feet by 1 foot deep. The feature is lined with cobbles, loose soil, juniper trees and organic debris; it also appears to have been altered by the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5.5 feet long by 2.5 feet wide by 1.5 feet deep. The infill was comprised of clay loam mixed with limestone boulders and tree roots. Excavation ceased when limestone bedrock was encountered.

F-114 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep and is lined by limestone cobbles, loose soil, and organic debris. It appears to have been altered by the actions of a burrowing mammal and is potentially the site of a bulldozer push pile. (possible ACI Feature No. 2803)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 3 feet wide by 2.5 feet deep. The infill was comprised of dark gray-brown clay loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-115 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature appears to be a limestone float slab uplifted by oak roots and has been enhanced by the actions of a burrowing mammal. (possible ACI Feature No. 2804)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet long by 1.5 feet wide by 1.5 feet deep. The infill was comprised of clay loam mixed with limestone gravel. Live tree roots were also a major constituent of the infill. Excavation ceased when limestone bedrock was encountered.

F-116 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet by 2 feet by 1 foot deep and is lined with loose soil and organic debris. The feature appears to be a stump hole at the base of a large oak tree that was struck by lightning. (ACI Feature No. 2708)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2 feet long by 1 foot wide by 16 inches deep. The top 11 inches of infill was comprised of dark brown organic loam that transitions to degraded limestone bedrock gravel. Live tree roots were also a major constituent of the infill. Excavation ceased when limestone bedrock was encountered.

F-117 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 1 foot deep. The feature is lined by cobble matrix and soil. It appears to have been altered by the actions of a burrowing mammal. (possibly ACI Feature No. 2802)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet long by 2.5 feet wide by 3 feet deep. The infill was comprised of dark brown clay loam. Live tree roots were also a major constituent of the infill. Excavation ceased when limestone bedrock was encountered.

F-118 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 6 feet by 4 feet by 1 foot deep. The feature has limestone boulders around the rim and is lined with loose soil and organic debris. Due to the presence of a large, dead oak, this feature is likely the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet in diameter by 3.5 feet deep. The top 1.5 feet of infill was comprised of dark brown clay loam, which transitions to red clay for the remainder of the feature. Large limestone boulders were also a major constituent of the infill. Excavation ceased when limestone bedrock was encountered.

F-119 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 6 feet by 5 feet by 1 foot deep. The feature has a rock rim on 2 sides and has the potential to be a karst feature. The feature has also been altered by the actions of a burrowing mammal. (ACI Feature No. 2723)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4.5 feet long by 3.5 feet wide by 3.5 feet deep. The top 10 inches of infill was comprised of dark brown organic humate which transitions to soft, degraded limestone for the remainder of the feature. Live tree roots were also a major constituent of the infill. Excavation ceased when limestone bedrock was encountered.

F-120a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 1 foot deep. It is lined by loose soil and organic debris. The feature appears to have been altered by the actions of a bulldozer and is adjacent to an old ranch fence.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2 feet deep. The infill was comprised of dark brown clay loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-120b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 15 feet by 10 feet by 1 foot deep and is lined by loose soil and organic debris. The feature appears to have been altered by the actions of a bulldozer and is adjacent to an old ranch fence. (possible ACI Feature No. 2804)

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2 feet in diameter by 7 inches deep. The infill was comprised of dark brown clay loam. Excavation ceased when limestone bedrock was encountered.

F-121 CLOSED DEPRESSION

Description:

This feature is described as a closed depression measuring approximately 3 feet in diameter by 6 inches deep and is lined with soil. The feature may be related to a previous attempt at fence installation or may be the result of a stump hole. The feature is located outside of the TxDOT ROW and therefore has not been excavated.

F-122 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 6 inches deep and is lined with loose soil and organic debris. The feature may be the result of previous fence installation or a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The top 12 inches of infill was comprised of gray-brown clay loam mixed with limestone cobbles which transitions to 12 inches of reddish brown clay. The final 5 inches of infill was comprised of degrading bedrock. Excavation ceased when limestone bedrock was encountered.

F-123 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet in diameter by 3 feet deep. The feature has a limestone slab or shelf directly above it and appears to have been further altered by the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 2.5 feet deep. The top 12 inches of infill was comprised of dark gray-brown clay loam mixed with limestone cobbles which transitions to weathered limestone bedrock for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-124a MANMADE FEATURE/TRENCH

Description:

The feature consists of a manmade feature/trench, likely created and used during previous archaeology investigations. It is immediately adjacent to a manmade limestone cobble wall (dry stack). The trench measures approximately 12 feet long by 4 feet wide by 3 feet deep and is in a heavily wooded area. The feature is clearly formed by human activity and therefore has not been excavated.

F-124b MANMADE FEATURE/TRENCH

Description:

The feature consists of a manmade feature/trench, likely created and used during previous archaeology investigations. It is immediately adjacent to a manmade limestone cobble wall (dry stack). The trench measures approximately 12 feet long by 4 feet wide by 1.5 feet deep and is in a heavily wooded area. The feature is clearly formed by human activity and therefore has not been excavated.

F-125 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet in diameter by 1 foot deep. The feature is lined with very loose soil and organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The top 18 inches of infill was comprised of gray-brown clay loam, which transitions to crumbled and eroded limestone bedrock for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-126 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 9 inches deep. The feature is lined with loose soil and organic debris and appears to have been altered by the actions of a burrowing mammal. A dig mound is present.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet long by 2 feet wide by 1.5 feet deep. The top foot of infill was comprised of dark gray-brown clay loam mixed with limestone cobbles which transitions to light brown sandy loam mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-127 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is described as a non-karst closed depression measuring approximately 8 feet by 3 feet by 1.5 feet deep. The feature is rimmed by limestone cobbles and appears to be a manmade feature, mainly due to its highly rectangular shape and proximity to a limestone cobble wall. The feature may be related to previous archaeology investigations of the Ransom Williams homestead site and will not be excavated.

F-128 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1 foot in diameter by 1 foot deep. The feature is partially rimmed by limestone cobbles and is lined with loose soil and organic debris. It appears to be the result of the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet long by 2.5 feet wide by 2.5 feet deep. The top 2 feet of infill was comprised of dark gray-brown clay loam mixed with limestone cobbles which transitions to light brown sandy loam mixed with degraded limestone bedrock for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-129 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 1.5 feet deep. The feature is lined with loose soil and organic debris and appears to be the result of the actions of a burrowing mammal. A dig mound is present.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The top 1.5 feet of infill was comprised of dark gray-brown clay loam mixed with limestone cobbles which transitions to reddish brown clay loam for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-130 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 1.5 feet in diameter by 1.5 feet deep. The feature is lined with loose soil and organic debris and appears to be the result of the actions of a burrowing mammal as a dig mound is present.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 7 feet long by 4 feet wide by 3.5 feet deep. The top 2 feet of infill was comprised of dark gray-brown clay loam mixed with limestone cobbles which transitions to caliche for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-131 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 5 feet by 2 feet by 1.5 feet deep. The feature is lined with loose soil and organic debris. The feature has two portals, is partially rimmed by bedrock, and appears to be the result of burrowing-mammal activity. It is likely that this feature is dug into a soft caliche bed.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 7 feet in diameter by 3.5 feet deep. The top foot of infill was comprised of dark grayish brown clay loam, which transitions to degraded limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-132 CLOSED DEPRESSION

Description:

This feature is described as a closed depression measuring approximately 3 feet in diameter by 6 inches deep. The feature is lined with loose soil and organic debris and appears to be the result of fence installation. It is located immediately adjacent to the TxDOT ROW; but within the LCRA ROW. Because of its location outside of the TxDOT ROW, this feature has not been excavated.

F-133a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that appears to be a part of a cluster of animal burrows and stump holes. The depression measures approximately 1 foot in diameter by 1.5 feet deep. This feature is directly adjacent to a dig mound is likely the result of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 2.5 feet wide by 3.5 feet deep. The top foot of infill was comprised of dark grayish brown clay loam which transitions to caliche for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-133b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that appears to be a part of a cluster of animal burrows and stump holes. The depression measures approximately 1.5 feet in diameter by 6 inches deep. This feature is lined with organic debris and appears to be the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3 feet in diameter by 3 feet deep. The top foot of infill was comprised of dark grayish brown clay loam which transitions to degraded limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-133c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that appears to be a part of a swarm of animal burrows and stump holes. The depression measures approximately 12 feet by 3 feet by 6 inches deep and is lined with organic debris.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 3 feet wide by 3 feet deep. The top foot of infill was comprised of dark grayish brown clay loam which transitions to degraded limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-133d NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that appears to be a part of a swarm of animal burrows and stump holes. The depression measures approximately 3 feet in diameter by 6 inches deep and is likely the result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 4 feet deep. The top 2 feet of infill was comprised of dark brown clay loam mixed with cobbles which transitions to degraded limestone for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-133e NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that appears to be a part of a swarm of animal burrows and stump holes. The depression measures approximately 3 feet by 2 feet by 2 feet deep. This feature is directly adjacent to a dig mound and is likely the result of the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 3 feet wide by 4 feet deep. The top 2 feet of infill was comprised of dark brown clay loam mixed with cobbles which transitions to degraded limestone for the remainder of the feature. An ancient and inactive karst formation that is severely weathered and degraded was revealed. A void within the degraded limestone tunnels around to the east and ostensibly connects to another small CD that was excavated into soft bedrock. This second CD is located 1.5 feet to the north of the main feature and showed identical stratigraphy. Excavation ceased when limestone bedrock was encountered.

F-134 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 3 feet in diameter by 1 foot deep. The feature is lined with loose soil and organic debris and appears to have been altered by the actions of a burrowing mammal as a dig mound is present.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 3.5 feet in diameter by 3 feet deep. The top 2 feet of infill was comprised of dark brown clay loam that transitions to reddish brown clay throughout the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-135 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression measuring approximately 2 feet in diameter by 2.5 feet deep. The feature is lined with loose soil and organic debris and appears to have been altered by the actions of a burrowing mammal as a dig mound is present.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 3.5 feet deep. The top 2.5 feet of infill was comprised of clay loam mixed with limestone cobbles and roots that transitions to red clay mixed with limestone cobbles throughout the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-137 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that was obscured by tall grass. It measures approximately 1.5 feet long, 1 foot wide and 6 inches deep, and is lined with loose soil and cobbles. Juniper trees are growing approximately 6 to 8 feet from the feature and there is a small (less than 0.5-inch diameter) solution cavity in the rock directly adjacent to the feature.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 6 feet long by 3.5 feet wide by 9 inches deep. The infill was comprised of light brown loam that was mixed with large limestone slabs. Excavation ceased when limestone bedrock was encountered.

F-138 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a small closed depression that measures 1 foot long by 0.5 foot wide by 4 inches deep and is lined with clay and cobbles. There appears to be some limestone rimming the feature, but it is loose and does not appear to be a bedrock formation. There also appears to be a small mound adjacent to the feature that is likely from the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 4 feet wide by 2.5 feet deep. The infill was comprised of red clay mixed with limestone cobbles. Excavation ceased when the use of hand tools was no longer feasible. The feature forms a small cavity between two immovable pieces of limestone, which appears to pinch off approximately 8 inches underneath the overhanging rock.

F-139 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a small, closed depression that measures 1 foot in diameter by 3 inches deep and is lined with clay, cobbles and prickly pear cactus. This feature is likely a stump hole because a dead juniper tree is lying on the ground directly adjacent to the depression.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 2.5 feet wide by 8 inches deep. The infill was comprised of light brown loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-140 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression that measures 1 foot in diameter by 6 inches deep and is lined with clay and organic debris. A partial limestone rim is present and there are small forbs and cedar elm seedlings lining the feature.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 5 feet long by 3 feet wide by 4 feet deep. The top 2 feet of infill was comprised of dark loam that transitions to red clay mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-141 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 1 foot in diameter by 6 inches deep and is lined with clay and organic debris. A dead juniper tree is lying directly adjacent to the feature and is the likely cause of the depression.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 4.5 feet deep. The top 1.5 feet of infill was comprised of dark, loam that transitions to red clay and limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-142 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2.5 feet in diameter by 8 inches deep. It is lined with grasses, loose soil and organic debris. The depression appears to be result of a stump hole.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet in diameter by 4.5 feet deep. The infill was comprised entirely of red clay and limestone cobbles. This feature showed no signs of either recharge or of karst formation, therefore excavation ceased when hand digging became infeasible.

F-143a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 10 feet long by 6 feet wide by 1 foot deep. It is lined with soil, organic debris and is likely the result of a stump hole. A large dead oak is nearby.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 2.5 feet long by 2 feet wide by 9 inches deep. The infill was comprised entirely of dark, loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-143b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 4 feet long by 5 feet wide by 8 inches deep. It is lined with soil, organic debris and is likely the result of a stump hole. A large dead oak is nearby.

Post-excavation Description:

The excavated feature is a non-karst closed depression that measures 4 feet long by 3.5 feet wide by 1.5 feet deep. The top half of the infill was comprised of brown loam that transitions to red clay and cobbles. Excavation ceased when limestone bedrock was encountered.

F-144 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 9 feet by 5 feet by 1 foot in depth that occurs adjacent to a small drainage. Several pieces of weathered speleothem formations are present and exposed at the surface directly adjacent to the depression. The feature is lined with grasses, cobbles and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet in diameter by 4.5 feet deep. The top 6 inches of infill consists of a mixture of red clay and dark loam that transitions to red clay and limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-145 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2 feet in diameter and 1 foot in depth. It appears to be formed along a bench in the bedrock that is directly adjacent to a drainage channel. There also appears to be a burrow mound surrounding the burrow opening that is partially rimmed by limestone.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5.5 feet long by 4.5 feet wide by 4.5 feet deep. The top foot of infill consists of a mixture of dark loam mixed with limestone cobbles that transitions to red clay mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-146 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that is covered by grass. It measures approximately 4 feet long, 3 feet wide and 6 inches deep and is lined with clay loam. This feature was observed to hold water approximately 12 hours after a rain event.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 1.5 feet deep. The top foot of the infill consists of dark brown clay loam that transitions to degraded limestone bedrock for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-147 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures approximately 1 foot in diameter by 6 inches deep. It is partially rimmed with limestone and is lined with red clay, grass and prickly pear cactus.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 1.5 feet deep. The top foot of the infill consists of dark brown loam mixed with limestone cobbles that transitions to red clay for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-148 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 4 feet in diameter by 6 inches deep. It is lined with clay, limestone cobbles, prickly pear cactus and forbs. A small portal or sunken area appears on the west rim of the depression. This feature appears to have been flagged by City of Austin staff.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 2.5 feet deep. The infill consists entirely of red clay mixed with limestone cobbles throughout the entire feature. Excavation ceased when limestone bedrock was encountered.

F-149 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 5 feet in diameter by 8 inches deep. It is lined with organic debris, clay, grasses and forbs. This feature is likely the result of human disturbance due to the presence of a push pile located approximately 12 feet away.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 3 feet wide by 1 foot deep. The infill consists entirely of red clay loam mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-150 OTHER

Pre-excavation Description:

The feature is perfectly circular and measures 1 foot in diameter by 1.5 feet deep. The symmetrical nature of this feature is indicative of a manmade hole; possibly created for a telephone pole and later abandoned. The feature is in an open area and is surrounded by grasses and forbs.

Post-excavation descriptions of F-150 are on the next page.

Post-excavation Description:

The excavated feature is likely a geotech borehole that measures 3 feet in diameter by 3 feet deep. The surface expression is a perfectly circular void in the ground. Hand excavation located a hole approximately 5 inches in diameter and of unknown length that was plugged with cement at the bottom of the original void. The walls of the smaller hole are indicative of action by a drill bit. The top 2 feet on infill was comprised of brown clay loam mixed with roots that transitions to red brown clay loam mixed with limestone cobbles and roots throughout the remainder of the features. Excavation ceased when the geotech borehole was discovered.

F-151 a-e

The excavated feature (151a-e) is a linear series of shallow depressions that extends for approximately 40 feet at the southern edge of an upland drainage. Each depression exhibits visible space between large, rounded chert and limestone cobbles, extending to 8 inches below the surface. Excavation revealed a 75% limestone cobble and 25% loam matrix over solid limestone bedrock at approximately 3 feet below the surface.

F-151a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 8 inches deep. It is lined with limestone cobbles, grasses, forbs and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5.5 feet long by 3.5 feet wide by 3 feet deep. The infill consists of approximately 75% limestone boulders and cobble mixed with approximately 25% dark brown clay loam throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-151b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 6 inches deep. It is lined with limestone cobbles, grasses, cacti, forbs and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet in diameter by 3 feet deep. The infill consists of approximately 75% limestone boulders and cobble mixed with approximately 25% dark brown clay loam throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-151c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 8 inches deep. It is lined with limestone cobbles, grasses, forbs and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 4 feet wide by 3 feet deep. The infill consists of approximately 75% limestone boulders and cobble mixed with approximately 25% dark brown clay loam throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-151d NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 2 feet in diameter by 6 inches deep. It is lined with limestone cobbles, grasses, forbs and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3.5 feet wide by 3 feet deep. The infill consists of approximately 75% limestone boulders and cobble mixed with approximately 25% dark brown clay loam throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-151e NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 1 foot in diameter by 8 inches deep. It is lined with limestone cobbles, grasses, forbs and clay.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 2.5 feet wide by 3 feet deep. The infill consists of approximately 75% limestone boulders and cobble mixed with approximately 25% dark brown clay loam throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-152 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep and is lined with organic debris, limestone slabs and loam. The feature is also surrounded by live persimmon trees.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 2.5 feet in diameter by 2.5 feet deep. The top 1.5 feet of infill consists of dark brown clay loam mixed with limestone cobbles that transitions to red-brown clay loam for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-153 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep and is lined with organic debris. The feature is located at the base of a live juniper tree.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 3 feet wide by 3.5 feet deep. The top foot of infill consists of dark clay loam that transitions to brown red clay for the remainder of the feature. Large limestone boulders were mixed throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-154a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 6 inches deep. It is lined with organic debris and several tree stumps. This feature is likely the result of a stump hole.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet in diameter by 1.5 feet deep. The infill consists of clay mixed with large limestone boulders throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-154b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2 feet in diameter by 1 foot deep. It is lined with organic debris and has a small persimmon growing out of it.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 2.5 feet wide by 1.5 feet deep. The infill consists of clay mixed with large limestone boulders throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-155 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 1 foot deep and is lined with organic debris, limestone cobbles and dark loam. The feature appears to be the result of root uplift that has been further altered by the actions of a burrowing mammal. A dead oak stump is also located within this feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 2.5 feet wide by 1.5 feet deep. The infill consists of clay mixed with large limestone boulders throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-156a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2 feet in diameter by 8 inches deep. It is lined with organic debris and is located within a grove of rotten oak stumps. The feature is likely the result of a collapsed mammal burrow and/or root rot.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet long 2.5 feet wide by 2 feet deep. The top 10 inches of infill consists of dark clay loam that transitions to red clay throughout the remainder of the feature. Large limestone slabs were present throughout the infill and cave crickets (*Ceuthophilus secretus*). Excavation ceased when limestone bedrock was encountered.

F-156b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2 feet in diameter by 8 inches deep. It is lined with organic debris and is located within a grove of rotten oak stumps. The feature is likely the result of a collapsed mammal burrow and/or root rot.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 2.5 feet long 2 feet wide by 2.5 feet deep. The infill consists of dark clay loam mixed with limestone cobbles throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-156c NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep. It is lined with organic debris, grasses, and forbs and is located within a grove of rotten oak stumps. The feature is likely the result of a collapsed mammal burrow and/or root rot.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3 feet in diameter by 2.5 feet deep. The infill consists of dark clay loam mixed with limestone cobbles throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-156d NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 8 inches deep. It is lined with organic debris, grasses, forbs, and juniper trees. The feature is likely the result of a collapsed mammal burrow and/or root rot.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet in long by 3 feet wide by 3 feet deep. The top 2 feet of infill consists of dark clay loam mixed with limestone boulders that transitions to degraded limestone throughout the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-158 NON-KARST CLOSED DEPRESSION

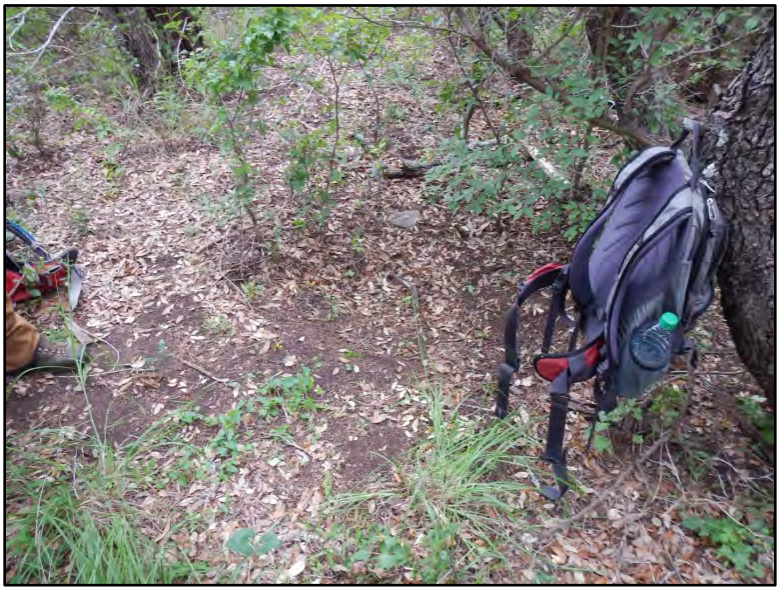
Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet long by 2 feet wide by 8 inches deep and is lined with organic debris. A small persimmon tree is also growing within the feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 2.25 feet deep. The top 8 inches of infill consists of dark grayish brown clay that transitions to reddish brown clay for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-159 NON-KARST CLOSED DEPRESSION



Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2.5 feet long by 2 feet wide by 6 inches deep and is lined with organic debris and loose loam. This feature is likely the result of a tree fall or stump hole.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet in diameter by 1.5 feet deep. The infill consisted of dark grayish brown clay mixed with degraded limestone throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-160 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 2.5 feet in diameter by 1 foot deep and is lined with organic debris and loose loam. This feature is located at the base of a live persimmon and appears to be the result of the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 2.5 feet deep. The top foot of infill consisted of dark clay loam that transitions to red clay mixed with degraded limestone and limestone cobbles throughout the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-162 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 1 foot in diameter by 8 inches deep and is lined with organic debris and loose loam. This feature is located at the base of a live oak and appears to be the result of the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature consists of a horizontal solution cavity at the base of a very soft limestone-bedding plane with a portal that measures approximately 5 feet long by 2.5 feet tall. The feature originally extended into the ground for approximately 9 feet. A jackhammer was used to carve off large pieces of the feature to allow further access by excavation crews. Approximately 4 feet of the top of this feature was removed using the jackhammer, thus rendering the final dimensions of the portal at 5 feet long by 2.5 feet tall; however the feature only extends into the ground for 4 feet before pinching off into limestone bedrock. The infill consisted of loose organic loam mixed with small and large tree roots. This feature sits at the base of a large oak and care was taken not to harm a root from the same tree that measures approximately 10 inches in diameter and extends into the feature. Excavation ceased at the bedrock floor.

F-164 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature is a non-karst closed depression represented by a roughly 3.5-inch gap between large limestone slabs that extends approximately 1 foot. A rain event washed away some of the leaf litter caught within the gap and it appears that a void exists under the limestone slabs.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3.5 feet long by 3 feet wide by 3 feet deep. The infill was comprised of red clay mixed with limestone slabs. Excavation revealed vuggy limestone bedrock beneath limestone slabs with no further visible extent. Excavation ceased when limestone bedrock was encountered.

F-165a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 3 feet long by 2 feet wide by 6 inches deep. It is lined with very hard, tightly packed black clay, grass and mesquite trees. This feature appears to be the result of a pig wallow.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 3 feet wide by 4 feet deep. The infill was comprised of dark vertisol clay mixed with few chert cobbles. This feature was likely the result of pig activity and excavation ceased when it became apparent that no karst characteristics were present.

F-165b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures approximately 2 feet long by 1 foot wide by 6 inches deep. It is lined with very hard, tightly packed black clay, grass and mesquite trees. This feature appears to be the result of a pig wallow.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 3.5 feet deep. The infill was comprised of dark vertisol clay mixed with few chert cobbles. This feature was likely the result of pig activity and excavation ceased when it became apparent that no karst characteristics were present.

F-166 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 6 feet long 2 feet wide by 1 foot deep and is lined with organic debris and loose loam. This feature is located at the base of a live persimmon and appears to be the result of the actions of a burrowing mammal that has dug multiple openings.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5.5 feet long by 3 feet wide by 4.5 feet deep. The infill was comprised of very loose silty loam that was mixed with limestone cobbles in the bottom foot of the feature. Large trees roots were present throughout the feature. Excavation ceased when limestone bedrock was encountered.

F-167a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures 5 feet long by 4 feet wide by 2 feet deep. It is lined with organic debris and loose loamy clay. This feature is located within a clump of oat trees and appears to be the result of a burrowing mammal.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 4 feet wide by 2 feet deep. The top 1.5 feet infill was comprised of dark grayish brown clay loam mixed with large tree roots that transitions to clay mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-167b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures 3 feet in diameter by feet deep. It is lined with organic debris and loose loamy clay. This feature is located within a clump of oat trees and appears to be the result of a burrowing mammal.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3 feet in diameter by 3 feet deep. The top 1.5 feet infill was comprised of dark grayish brown clay loam mixed with large tree roots that transitions to clay mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-168 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that appears to have once functioned as a stock pond within an upland drainage. It measures approximately 37 feet long by 32 feet wide by 1 foot deep. A berm exists at the east side of the feature to capture water and the infill consists of red clay mixed with limestone cobbles.

Post-excavation Description:

The feature consists of a non-karst closed depression. The TxDOT backhoe crew excavated two linear trenches in the center of the stock pond that were perpendicular to one another. One trench measures approximately 21feet long 2 feet deep, while the second trench measured approximately 24 feet long by 2 feet deep. Infill consists of brownish red to red clay over bedrock. Excavation ceased when limestone bedrock was encountered.

F-169 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 5 feet long 3 feet wide by 1.25 feet deep and is lined with organic debris and clay. This feature is likely the result of a stump hole that has been altered by the actions of a burrowing mammal.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 5 feet long by 2.5 feet wide by 2.5 feet deep. The top foot of infill was comprised of orange brown clay loam mixed with tree roots that transitions to dry red brown clay mixed with tree roots for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-171a NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep. It is lined with grasses, forbs, organic debris and limestone cobbles.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3 feet in diameter by 2 feet deep. The top foot of infill was comprised of dark brown clay that transitions to sticky red clay for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-171b NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

This feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep. It is lined with grasses, forbs, organic debris and limestone cobbles.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3 feet in diameter by 2 feet deep. The top foot of infill was comprised of dark brown clay that transitions to sticky red clay for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-172 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 1 foot deep. It is lined with grasses and forbs with several dead oaks being present within the immediate vicinity. This feature is likely the result of a stump hole.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4 feet long by 3 feet wide by 1 foot deep. The infill was comprised of dark brown clay loam mixed with limestone cobbles. Excavation ceased when limestone bedrock was encountered.

F-173 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature consists of a non-karst closed depression that measures 3 feet in diameter by 6 inches deep. It is lined with grasses and forbs with several dead oaks being present within the immediate vicinity. This feature is likely the result of a stump hole. A living oak tree is also present on one side of this feature.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 2.5 feet in diameter by 2.5 feet deep. The top 6 inches of infill was comprised of dry clay loam that transitions to dry clay loam mixed with large limestone cobbles for the remainder of the feature. Large tree roots were present throughout the infill. Excavation ceased when limestone bedrock was encountered.

F-174 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature measures 5 feet long by 3 feet wide by 6 inches deep and is lined with grasses and forbs. A large dead oak is immediately adjacent to this feature and is the likely cause of the depression.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 4.5 feet long by 3 feet wide by 3 feet deep. The top foot of infill was comprised of dark brown clay loam that transitions to degraded limestone mixed with limestone cobbles for the remainder of the feature. Excavation ceased when limestone bedrock was encountered.

F-175 NON-KARST CLOSED DEPRESSION

Pre-excavation Description:

The feature measures 12 feet long by 10 feet wide by 4 inches deep and is lined with grasses and forbs. This location appears to be a low spot and water may be held here for brief periods immediately after a rain event.

Post-excavation Description:

The excavated feature consists of a non-karst closed depression that measures 3 feet in diameter by 2 feet deep. The infill was comprised of approximately 80% degraded limestone mixed with dry reddish brown clay in the remaining 20% of infill. Excavation ceased when limestone bedrock was encountered.

MAPPED FAULTS WITHIN PROJECT AREA

FAULT 1

The feature consists of a mapped fault in the Dolomitic Member of the Edwards Limestone. The feature is ranked as sensitive because of its association with a surface stream channel, and because the potential for recharge is greater. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 2

The feature consists of a mapped fault that forms the boundary between the Dolomitic and Kirschberg Members of the Edwards Limestone. The feature is ranked as sensitive and may be related to the development of features F157 (SH45 Cave) and F170 (MoPac Sink). The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 3

The feature consists of a mapped fault that forms the boundary between the Dolomitic and Kirschberg Members of the Edwards Limestone. The feature is ranked as sensitive appears to be expressed at feature F-41. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 4

The feature consists of a mapped fault that forms the boundary between the Dolomitic, Grainstone, and Kirschberg Members of the Edwards Limestone. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 5

The feature consists of a mapped fault that forms the boundary between the Grainstone and Kirschberg Members of the Edwards Limestone. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 6

The feature consists of a mapped fault that forms the boundary between the Grainstone and Regional Dense Members of the Edwards Limestone. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 7

The feature consists of a mapped fault that forms the boundary between the Grainstone, Regional Dense, Leached and Collapsed, and Kirschberg Members of the Edwards Limestone. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 8

The feature consists of a mapped fault that forms the boundary between the Leached and Collapsed Member of the Edwards Limestone and the Del Rio Clay. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 9

The feature consists of a mapped fault in the Del Rio Clay. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

FAULT 10

The feature consists of a mapped fault that forms the boundary between the Del Rio Clay and the Buda Limestone. The feature is ranked as non-sensitive due to a lack of surface features aligned with the fault, and because of the relatively thick clayey soil cover in the area. The location of this fault is based on geologic maps provided by the City of Austin.

SECTION 5.0

GEOLOGIC ASSESSMENT TABLES

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: State Highway 45 Southwest

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11	12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	MOD	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)	TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F1	30.171967	-97.888292	CD	5	Ked	6	4	1	N40E	10			O	20	35	X			X	Drainage
F2	30.171228	-97.887546	CD	5	Ked	3.5	3	0.4					F,V	20	25	X		X		Hillside
F3	30.171284	-97.887348	CD	5	Ked	2.75	2	0.9					O,F	20	25	X		X		Hillside
F4	30.171409	-97.887063	CD	5	Ked	23	12	1.5					C,O,F	20	25	X			X	Drainage
F5	30.171532	-97.886835	CD	5	Ked	2	1	1					O,F	20	25	X		X		Hillside
F6	30.171609	-97.886693	CD	5	Ked	65	2	1					C	20	25	X		X		Hillside
F7	30.171505	-97.886635	CD	5	Ked	1	1	0.75					F,V	20	25	X		X		Hillside
F8a	30.171222	-97.886259	SC	20	Ked	1	0.4	3					O,F	15	35	X		X		Hillside
F8b	30.17126	-97.886335	CD	5	Ked	8	4.5	0.5					O,F	20	25	X		X		Hillside
F9	30.170996	-97.886193	CD	5	Ked	3.5	3	0.5					F,V	20	25	X		X		Hillside
F10	30.170869	-97.886924	CD	5	Ked	4.5	2.5	0.75					O,F,V	20	25	X		X		Hillside
F11	30.170397	-97.886863	CD	5	Ked	1	0.75	0.9					F,V	20	25	X		X		Hillside
F12	30.170388	-97.886197	CD	5	Ked	3	2	1.5					O,F	20	25	X		X		Hillside
F13	30.170136	-97.886201	CD	5	Ked	1.5	1.5	1					C,O,F	20	25	X		X		Hillside
F14	30.169778	-97.886088	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F15	30.16949	-97.88636	CD	5	Ked	2.5	1.5	1					C,O,F	20	25	X		X		Hillside
F16	30.169381	-97.886556	SH	20	Ked	7	4	2					C,O,F	25	45		X	X		Hillside
F17	30.168987	-97.885654	CD	5	Ked	4	1	1					O,F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

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Date 1/22/15

Sheet 1 of 13

STATE OF TEXAS
KEMBLE WHITE
GEOLOGY
NO. 3863
LICENSED
PROFESSIONAL GEOSCIENTIST

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F18	30.169508	-97.885138	C	30	Ked	38	40	15	N30E	10			C,O,F	35	75		X	X		Hillside
F19a	30.168633	-97.885109	CD	5	Ked	1.5	1	1					O,F	20	25	X		X		Hillside
F19b	30.168569	-97.88516	CD	5	Ked	2	2	0.5					O,F	20	25	X		X		Hillside
F19C	30.168483	-97.885273	CD	5	Ked	1.5	1	1					O,F	20	25	X		X		Hillside
F20	30.168133	-97.885453	CD	5	Ked	1	1	0.8					C,F	20	25	X		X		Hillside
F21	30.167693	-97.885447	CD	5	Ked	1.5	1	2.5					O,F	20	25	X		X		Hillside
F22a	30.167928	-97.884434	SC	20	Ked	4	2	1					C,F	15	35	X		X		Hillside
F22b	30.167856	-97.884229	CD	5	Ked	1	1	0.5					F	20	25	X		X		Hillside
F23	30.166927	-97.884206	SH	20	Ked	19	12	4	N45E	10			C,F	30	60		X	X		Hillside
F24	30.166964	-97.884992	CD	5	Ked	0.8	0.5	0.3					C,F	20	25	X		X		Hillside
F25	30.166988	-97.883741	CD	5	Ked	2	1	1					F	20	25	X		X		Hillside
F26	30.165957	-97.883993	CD	5	Ked	4	3.5	0.5					C,F	20	25	X		X		Hillside
F27a	30.165343	-97.883697	CD	5	Ked	7	7	1					O,F	20	25	X		X		Hillside
F27b	30.165281	-97.883614	CD	5	Ked	8	3.5	1					O,F	20	25	X		X		Hillside
F27c	30.165401	-97.883727	CD	5	Ked	2	2	1					O,F	20	25	X		X		Hillside
F28	30.165402	-97.883351	CD	5	Ked	3	1.5	1					C,F	20	25	X		X		Hillside
F29a	30.165289	-97.882761	CD	5	Ked	4	4	4					C,F	20	25	X		X		Hillside
F29b	30.165193	-97.882729	SC	20	Ked	2	2	4					C,F	25	45		X	X		Hillside
F29c	30.165187	-97.882719	SC	20	Ked	2.5	1	5					C,F	25	45		X	X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
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Z	Zone, clustered or aligned features	30

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Sheet 2 of 13

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																	
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING			
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	ROD	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F29d	30.165159	-97.882768	SC	20	Ked	2.5	2	4					C,F	25	45		X	X		Hillside
F30	30.164578	-97.883581	CD	5	Ked	7	7	0.9					C,F	20	25	X		X		Hillside
F31	30.165018	-97.882627	CD	5	Ked	1	1	1					C,F	20	25	X		X		Hillside
F32	30.164066	-97.882458	SC	20	Ked	6	5	5					C,F	15	35	X		X		Hillside
F33	30.163838	-97.881888	SC	20	Ked	1.5	1	1.5					F	15	35	X		X		Hillside
F34	30.163491	-97.881687	SC	20	Ked	5	4	3					F,V	15	35	X		X		Hillside
F35	30.163102	-97.881923	CD	5	Ked	26	15	1					F,V	20	25	X		X		Hillside
F36	30.163217	-97.882093	CD	5	Ked	2	0.3	0.8					F,V	20	25	X		X		Hillside
F37	30.162577	-97.882271	CD	5	Ked	5	3	0.8					O,F	20	25	X		X		Hillside
F38	30.162471	-97.881712	CD	5	Ked	4	3	0.8					F	20	25	X		X		Hillside
F39	30.162343	-97.880938	CD	5	Ked	3	2	1					C,F,V	20	25	X		X		Hillside
F40	30.162211	-97.880997	CD	5	Ked	4	4	1					C,F,V	20	25	X		X		Hillside
F41	30.162378	-97.881181	SC	20	Ked	0.5	0.5	1					N,C,O	25	45		X	X		Hillside
F42a	30.162236	-97.881249	CD	5	Ked	3	3	1.5					C,F	20	25	X		X		Hillside
F42b	30.162225	-97.881216	CD	5	Ked	3	2.5	0.8					C,F	20	25	X		X		Hillside
F43	30.162121	-97.881356	CD	5	Ked	4	4	2					O,F	20	25	X		X		Hillside
F44a	30.162192	-97.881435	CD	5	Ked	7	7	0.7					C,F,V	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
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Sheet 3 of 13

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: State Highway 45 Southwest

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F44b	30.162202	-97.881393	CD	5	Ked	4	4	0.7					C,F,V	20	25	X		X		Hillside
F45	30.161222	-97.881318	CD	5	Ked	5	5	1.5					C,O,F	20	25	X		X		Hillside
F46	30.161015	-97.881198	CD	5	Ked	5	5	0.7					O,F	20	25	X		X		Hillside
F47a	30.161591	-97.880689	CD	5	Ked	3	3	1					O,F	20	25	X		X		Hillside
F47b	30.161596	-97.880666	CD	5	Ked	2	2	0.7					O,F	20	25	X		X		Hillside
F48	30.161545	-97.880562	CD	5	Ked	4	4	0.5					O,F	20	25	X		X		Hillside
F49	30.161389	-97.880385	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F50	30.161088	-97.880784	CD	5	Ked	0.5	0.5	0.9					O,F	20	25	X		X		Hillside
F51	30.160851	-97.881333	CD	5	Ked	20	20	1.5					O,F,C	20	25	X		X		Hillside
F52	30.160855	-97.881027	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F53	30.160169	-97.880788	CD	5	Ked	1	1	1					C,O	20	25	X		X		Hillside
F54	30.16006	-97.880778	SC	20	Ked	4	3	1.5					F,C	15	35	X		X		Hillside
F55	30.16009	-97.880452	SF	20	Ked	3	0.1	0.5	N40E	10			N	35	65		X		X	Drainage
F56	30.160515	-97.880291	CD	5	Ked	5	5	0.5					O,F,C	20	25	X		X		Hillside
F57a	30.160955	-97.879869	CD	5	Ked	40	40	1.5					F	20	25	X			X	Drainage

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

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STATE OF TEXAS
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NO. 3863
LICENSED
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Date 1/22/15

Sheet 4 of 13

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																	
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP/4	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F57b	30.160955	-97.879869	CD	5	Ked	8	4	1					O,C	20	25	X		X		Hillside
F58a	30.157818	-97.878889	CD	5	Ked	50	39	1.5					F	20	25	X		X		Hillside
F58b	30.157721	-97.879018	CD	5	Ked	16	16	1					F	20	25	X		X		Hillside
F59a/b	30.157419	-97.878887	SC	20	Ked	6	4	4					O,F	15	35	X		X		Hillside
F59c	30.157471	-97.878825	CD	5	Ked	4	4	0.5					O,F	20	25	X		X		Hillside
F59d	30.157422	-97.878797	CD	5	Ked	5	5	0.5					O,F	20	25	X		X		Hillside
F59e	30.157399	-97.87879	CD	5	Ked	6	6	0.5					O,F	20	25	X		X		Hillside
F60	30.157293	-97.878599	CD	5	Ked	3	3	0.5					O,C	20	25	X		X		Hillside
F61	30.156836	-97.878466	SC	20	Ked	5	4	4					O	15	35	X		X		Hillside
F62a	30.156529	-97.877461	SH	20	Ked	30	30	1					F	20	40		X	X		Hillside
F62b	30.156558	-97.877596	CD	5	Ked	8	8	1					C,F	20	25	X		X		Hillside
F63a	30.155366	-97.877766	CD	5	Ked	10	6	1					C,O	20	25	X		X		Hillside
F63b	30.155358	-97.877808	CD	5	Ked	4	4	0.5					C,O	20	25	X		X		Hillside
F64	30.152815	-97.874921	C	30	Ked	1	3	15	N35E	10			N	35	75		X	X		Hillside
F65	30.152975	-97.874802	C	30	Ked	3	1.5	4	N35E	10			N,C	35	75		X	X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
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MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
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C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
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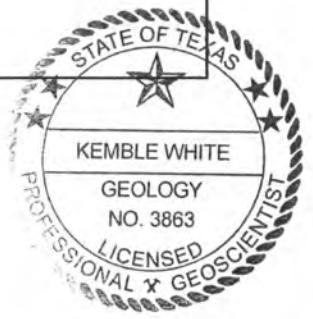

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TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: State Highway 45 Southwest

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	RQD	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F66	30.160327	-97.880009	CD	5	Ked	3	3	1					F,V,C	20	25	X		X		Hillside
F67a	30.160029	-97.880312	CD	5	Ked	2	2	0.8					O,F	20	25	X		X		Hillside
F67b	30.160078	-97.880321	CD	5	Ked	4	3	0.5					O	20	25	X		X		Hillside
F67c	30.160105	-97.880347	CD	5	Ked	8	4	0.5					O,F,C	20	25	X		X		Hillside
F68	30.159797	-97.880483	CD	5	Ked	3	2	0.5					C,O,F	20	25	X		X		Drainage
F69	30.159675	-97.88046	CD	5	Ked	4	3	0.5					C,O,F	20	25	X		X		Hillside
F70	30.159579	-97.880687	CD	5	Ked	3	2	1					C,O,F	20	25	X		X		Hillside
F71	30.159283	-97.879786	CD	5	Ked	2	2	0.8					O,F	20	25	X		X		Hillside
F72	30.159226	-97.879611	SC	20	Ked	1.5	0.9	1.5					O,F,C	15	35	X		X		Hillside
F73	30.159545	-97.879482	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F74	30.159755	-97.879488	CD	5	Ked	2	2	0.5					O,F,C	20	25	X		X		Hillside
F75	30.159483	-97.879077	CD	5	Ked	4	3	1					O,F,C	20	25	X		X		Hillside
F76	30.159581	-97.879136	CD	5	Ked	3	2	1					O,F	20	25	X		X		Hillside
F77	30.159104	-97.879245	CD	5	Ked	12	8	0.5					O,F	20	25	X		X		Hillside
F78	30.159073	-97.87959	CD	5	Ked	3	3	0.8					O,F	20	25	X		X		Hillside
F79	30.158788	-97.87959	CD	5	Ked	15	7	0.8					F,V	20	25	X		X		Hillside
F80	30.158288	-97.879593	CD	5	Ked	2	2	1.5					O,F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
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TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																	
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	MOD 10	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z								<40	>40	<1.6	>1.6	
F81	30.158857	-97.878701	CD	5	Ked	3	2	0.8					F	20	25	X		X		Hillside
F82a	30.158457	-97.878587	CD	5	Ked	3	2	0.5					F,V	20	25	X		X		Hillside
F82b	30.15846	-97.8786	CD	5	Ked	3	3	0.5					O,F	20	25	X		X		Hillside
F83a	30.15824	-97.878809	CD	5	Ked	8	4	0.8					F,V	20	25	X		X		Hillside
F83b	30.158279	-97.878753	CD	5	Ked	3	1.5	0.8					O,F,V	20	25	X		X		Hillside
F83c	30.158284	-97.878771	CD	5	Ked	2	2	0.3					F,V	20	25	X		X		Hillside
F84	30.157631	-97.878678	CD	5	Ked	2	2	1					F,V	20	25	X		X		Hillside
F85a	30.157565	-97.878408	CD	5	Ked	5	5	0.5					O,F,V	20	25	X		X		Hillside
F85b	30.157591	-97.878361	CD	5	Ked	12	8	0.5					O,F,V	20	25	X		X		Hillside
F86	30.157459	-97.87809	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F90	30.156713	-97.878551	CD	5	Ked	12	9	0.5					O,C	20	25	X		X		Hillside
F91	30.156475	-97.878354	CD	5	Ked	4	4	0.8					F	20	25	X		X		Hillside
F92a	30.15678	-97.878171	CD	5	Ked	2	2	0.5					O,C	20	25	X		X		Hillside
F92b	30.156791	-97.87818	CD	5	Ked	2	2	0.5					O,C	20	25	X		X		Hillside
F93a	30.156503	-97.877818	CD	5	Ked	4	4	1					F	20	25	X		X		Hillside
F93b	30.15653	-97.877818	CD	5	Ked	4	4	0.5					O,C	20	25	X		X		Hillside
F94	30.156522	-97.877953	CD	5	Ked	10	5	0.5					F,C	20	25	X		X		Hillside
F95a	30.156376	-97.878139	CD	5	Ked	4.5	3	1					F	20	25	X		X		Hillside
F95b	30.156425	-97.878178	CD	5	Ked	10	4	0.5					F	20	25	X		X		Hillside
F96	30.156266	-97.87813	CD	5	Ked	10	5	1					F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
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8A INFILLING	
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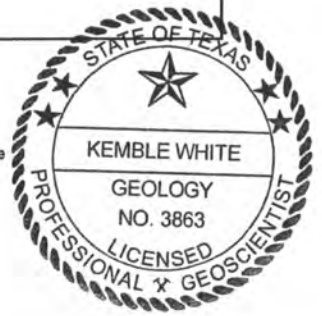

Date 1/22/15

Sheet 7 of 13

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
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FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	ROD	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F97a	30.156267	-97.87827	CD	5	Ked	5	5	0.5					O,F	20	25	X		X		Hillside
F97b	30.156173	-97.87827	CD	5	Ked	4	4	1					O,F	20	25	X		X		Hillside
F98	30.156008	-97.877418	CD	5	Ked	6	4	1					C,F	20	25	X		X		Hillside
F99	30.1562	-97.877797	CD	5	Ked	9	6	1.5					F,C	20	25	X		X		Hillside
F100	30.155401	-97.877639	CD	5	Ked	1	1	1					O,F	20	25	X		X		Hillside
F101	30.155012	-97.877381	O	5	Ked	20	20	0.5					C	20	25	X		X		Hillside
F102	30.155301	-97.87711	CD	5	Ked	3	3	1					O,F	20	25	X		X		Hillside
F103	30.155956	-97.877691	CD	5	Ked	3	3	0.5					F	20	25	X		X		Hillside
F104	30.1531	-97.87596	CD	5	Ked	3	3	1					C,O,F	20	25	X		X		Hillside
F105	30.153602	-97.875964	CD	5	Ked	1	1	0.8					C,F	20	25	X		X		Hillside
F106	30.152445	-97.875193	CD	5	Ked	1	1	1.5					F,C	20	25	X		X		Hillside
F107	30.152213	-97.875258	O	5	Ked	40	25	2					N	20	25	X			X	Drainage
F108	30.151938	-97.874574	CD	5	Ked	2	2	0.5					O,C,F	20	25	X		X		Hillside
F109	30.151138	-97.873747	CD	5	Ked	2	2	0.5					C	20	25	X		X		Hillside
F110	30.150888	-97.873591	C	30	Ked	30	30	20	N35E	10			C,O,F,V	35	75		X	X		Hillside
F111	30.151309	-97.873519	CD	5	Ked	3	3	1					C,O,F	20	25	X		X		Drainage
F112	30.15066	-97.872906	CD	5	Ked	2	2	1					O,F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
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8A INFILLING	
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TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: State Highway 45 Southwest																	
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING			
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10			11		12
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						X	Y	Z		10						<40	>40		<1.6	>1.6	
F113	30.149687	-97.872855	CD	5	Ked	4	2	1					C,O,F	20	25	X			X		Hillside
F114	30.150008	-97.872526	CD	5	Ked	3	3	1					O,F	20	25	X			X		Hillside
F115	30.150054	-97.872695	CD	5	Ked	1	1	1					O,F	20	25	X			X		Hillside
F116	30.150159	-97.872348	CD	5	Ked	3	2	1					O,F	20	25	X			X		Hillside
F117	30.150126	-97.872093	CD	5	Ked	2	2	1					O,F	20	25	X			X		Hillside
F118	30.149857	-97.872268	CD	5	Ked	6	4	1					O,F	20	25	X			X		Hillside
F119	30.149773	-97.871453	CD	5	Ked	6	5	1					C,O,F	20	25	X			X		Hillside
F120a	30.149138	-97.871533	CD	5	Ked	15	10	1					O,F	20	25	X			X		Hillside
F120b	30.149135	-97.871528	CD	5	Ked	2	2	0.6					O,F	20	25	X			X		Hillside
F121	30.14831	-97.8699	CD	5	Ked	3	3	0.5					F	20	25	X			X		Hillside
F122	30.147235	-97.870811	CD	5	Ked	3	3	0.5					O,F	20	25	X			X		Hillside
F123	30.147084	-97.869133	CD	5	Ked	5	5	3					O,F	20	25	X			X		Hillside
F124a	30.146446	-97.869245	O	5	Ked	12	4	3					F	20	25	X			X		Hillside
F124b	30.146408	-97.869292	O	5	Ked	12	4	1.5					F	20	25	X			X		Hillside
F125	30.14652	-97.86936	CD	5	Ked	5	5	1					O,F	20	25	X			X		Hillside
F126	30.146313	-97.868782	CD	5	Ked	3	3	0.8					O,F	20	25	X			X		Hillside
F127	30.146594	-97.868884	CD	5	Ked	8	3	1.5					O,F	20	25	X			X		Hillside

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2A TYPE	TYPE	2B POINTS
C	Cave	30
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TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: State Highway 45 Southwest

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F128	30.146591	-97.868653	CD	5	Ked	1	1	1					C,O,F	20	25	X		X		Hillside
F129	30.14545	-97.868918	CD	5	Ked	2	2	1.5					O,F	20	25	X		X		Hillside
F130	30.145756	-97.868566	CD	5	Ked	1.5	1.5	1.5					O,F	20	25	X		X		Hillside
F131	30.145657	-97.868239	CD	5	Ked	5	2	1.5					C,O	20	25	X		X		Hillside
F132	30.145701	-97.86805	CD	5	Ked	3	3	0.5					O,F	20	25	X		X		Hillside
F133a	30.145344	-97.868134	CD	5	Ked	1	1	1.5					F,V	20	25	X		X		Hillside
F133b	30.145317	-97.868161	CD	5	Ked	1.5	1.5	0.5					C,F	20	25	X		X		Hillside
F133c	30.145255	-97.868201	CD	5	Ked	12	3	0.5					C,F	20	25	X		X		Hillside
F133d	30.145299	-97.868214	CD	5	Ked	3	3	0.5					C,O,F	20	25	X		X		Hillside
F133e	30.145225	-97.868288	CD	5	Ked	3	2	2					C,O,F	20	25	X		X		Hillside
F134	30.14475	-97.86874	CD	5	Ked	3	3	1					O,F	20	25	X		X		Hillside
F135	30.144564	-97.867559	CD	5	Qtt	2	2	2.5					C,O,F	20	25	X		X		Hillside
F136	30.167053	-97.884723	SC	20	Ked	5.5	4.5	7					O,F	15	35	X		X		Hillside
F137	30.16704	-97.884011	CD	5	Ked	1.5	1	0.5					O	20	25	X		X		Hillside
F138	30.167505	-97.884643	CD	5	Ked	1	0.5	0.3					F,C	20	25	X		X		Hillside
F139	30.167304	-97.884854	CD	5	Ked	1	1	0.3					F,C	20	25	X		X		Hillside
F140	30.161126	-97.880487	CD	5	Ked	1	1	0.5					O,F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
C	Cave	30
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SF	Solution-enlarged fracture(s)	20
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Kemble White

Date 1/22/15

STATE OF TEXAS
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Sheet 10 of 13

TCEQ-0585-Table (Rev. 10-01-04)

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						X	Y	Z		10						<40	>40	<1.6	>1.6	
F141	30.160977	-97.880471	CD	5	Ked	1	1	0.5					O,F	20	25	X		X		Hillside
F142	30.171656	-97.887404	CD	5	Ked	2.5	2.5	0.8					F,C	20	25	X		X		Hillside
F143a	30.159749	-97.880181	CD	5	Ked	10	6	1					O,C	20	25	X		X		Hillside
F143b	30.159756	-97.880144	CD	5	Ked	4	5	0.8					O,F,C	20	25	X		X		Hillside
F144	30.159619	-97.880171	CD	5	Ked	9	5	1					O,F,C	20	25	X		X		Hillside
F145	30.159731	-97.880414	CD	5	Ked	2	2	1					O,F,C	20	25	X		X		Hillside
F146	30.156267	-97.877627	CD	5	Ked	4	3	0.5					O,F	20	25	X		X		Hillside
F147	30.166632	-97.883974	CD	5	Ked	1	1	0.5					O,F,C	20	25	X		X		Hillside
F148	30.158088	-97.879102	CD	5	Ked	4	4	0.5					F,C	20	25	X		X		Hillside
F149	30.140379	-97.866287	CD	5	Qtt	5	5	0.8					C,O	20	25	X		X		Hillside
F150	30.13703	-97.86491	O	5	Qtt	1	1	1.5					O.F	30	35	X		X		Hillside
F151a	30.140764	-97.866694	CD	5	Qtt	2	2	0.8					O,C	20	25	X		X		Hillside
F151b	30.140748	-97.866712	CD	5	Qtt	2	2	0.5					O,C	20	25	X		X		Hillside
F151c	30.140711	-97.866728	CD	5	Qtt	2	2	0.8					O,C	20	25	X		X		Hillside
F151d	30.140698	-97.866738	CD	5	Qtt	2	2	0.5					O,C	20	25	X		X		Hillside
F151e	30.140668	-97.866761	CD	5	Qtt	1	1	0.8					O,C	20	25	X		X		Hillside
F152	30.173018	-97.888651	CD	5	Ked	3	3	0.5					O,C,F	20	25	X		X		Hillside
F153	30.173235	-97.88888	CD	5	Ked	3	3	0.5					O,C,F	20	25	X		X		Hillside
F154a	30.173586	-97.889342	CD	5	Ked	4	3	0.5					F,C	20	25	X		X		Hillside
F154b	30.173606	-97.889277	CD	5	Ked	2	2	1					F,C	20	25	X		X		Hillside
F155	30.173736	-97.889232	CD	5	Ked	3	3	1					F,C	20	25	X		X		Hillside
F156a	30.173903	-97.889307	CD	5	Ked	2	2	0.8					C,O,F	20	25	X		X		Hillside
F156b	30.173903	-97.889307	CD	5	Ked	2	2	0.8					C,O,F	20	25	X		X		Hillside

* DATUM: NAD83

2A TYPE	TYPE	2B POINTS
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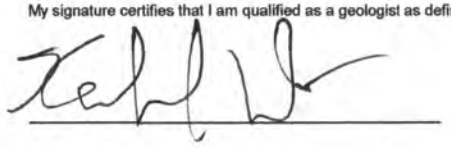
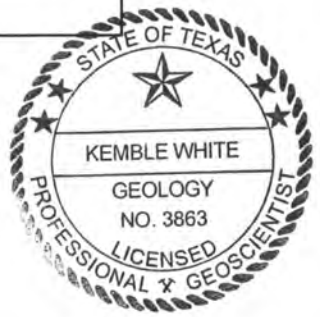


Date 1/22/15



Sheet 11 of 13

TCEQ-0585-Table (Rev. 10-01-04)

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						X	Y	Z		10						<40	>40		<1.6	>1.6	
F156c	30.173903	-97.889307	CD	5	Ked	3	3	0.5					C,O	20	25	X			X		Hillside
F156d	30.173903	-97.889307	CD	5	Ked	3	3	0.8					C,O	20	25	X			X		Hillside
F157a	30.174515	-97.889196	C	30	Ked				N70E	10			C,O	35	75		X		X		Hillside
F157b	30.174573	-97.889197	C	30	Ked	5	3	6	N70E	10			C,O	35	75		X		X		Hillside
F158	30.174519	-97.889376	CD	5	Ked	3	2	0.8					O	20	25	X			X		Hillside
F159	30.175702	-97.890507	CD	5	Ked	2.5	2	0.5					C,F	20	25	X			X		Hillside
F160	30.176148	-97.891817	CD	5	Ked	2.5	2.5	1					C,O,F	20	25	X			X		Hillside
F161	30.177759	-97.893585	SF	20	Ked	500			N40E	10			N	35	65		X			X	Streambed
F162	30.179876	-97.896364	CD	5	Ked	1	1	0.8					F	20	25	X			X		Hillside
F163	30.179899	-97.896784	SC	20	Ked	2	1.5	3					C,O	25	45		X		X		Hillside
F164	30.180194	-97.896908	CD	5	Ked	0.3	0.3	1					C,F	20	25	X			X		Hillside
F165a/b	30.131987	-97.860535	CD	5	Qtt	3	2	0.5					C,O	20	25	X			X		Hillside
F166	30.134322	-97.862275	CD	5	Qtt	6	2	1					C,O	20	25	X			X		Hillside
F167a	30.135356	-97.863397	CD	5	Qtt	5	4	2					C,O	20	25	X			X		Hillside
F167b	30.135356	-97.863397	CD	5	Qtt	3	3	3					C,O	20	25	X			X		Hillside
F168	30.134809	-97.863264	CD	5	Qtt	37	32	1					F,C	20	25	X			X		Hillside
F169	30.136148	-97.863917	CD	5	Qtt	5	3	1.3					O	20	25	X			X		Hillside
F170	30.175227	-97.886183	SH	20	Ked	100	100	2	N70E	10			F,V,C	35	65	X				X	Hillside
F171a	30.135467	-97.86378	CD	5	Qtt	3	3	0.5					F	20	25	X			X		Hillside
F171b	30.135422	-97.863752	CD	5	Qtt	3	3	0.5					F	20	25	X			X		Hillside
F172	30.140035	-97.866245	CD	5	Qtt	4	3	1					C,O	20	25	X			X		Hillside

* DATUM: NAD83

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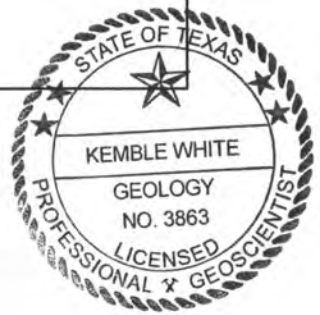

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Kemble White

Date 11/22/15

Sheet 12 of 13

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: State Highway 45 Southwest

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
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						X	Y	Z		10						<40	>40	<1.6	>1.6	
F173	30.134983	-97.863396	CD	5	Kdr	3	3	0.5					C,O	20	25	X		X		Hillside
F174	30.134602	-97.863044	CD	5	Kdr	5	3	0.5					C,O	20	25	X		X		Hillside
F175	30.134253	-97.862698	CD	5	Kdr	12	10	0.3					C,F	20	25	X		X		Hillside
Fault 1			F	20	Ked	500			N35E	10			X	35	65		X		X	Floodplain
Fault 2			F	20	Ked	500			N35E	10			X	30	60		X		X	Hillside
Fault 3			F	20	Ked	500			N55W	10			X	20	50		X		X	Hillside
Fault 4			F	20	Ked	500			N20E	10			X	5	35	X			X	Hillside
Fault 5			F	20	Ked	500			N30E	10			X	5	35	X			X	Hillside
Fault 6			F	20	Ked	500			N35E	10			X	5	35	X			X	Hillside
Fault 7			F	20	Ked	500			N30E	10			X	5	35	X			X	Hillside
Fault 8			F	20	Kdr	500			N30E	10			X	5	35	X			X	Hillside
Fault 9			F	20	Kdr	500			N30E	10			X	5	35	X			X	Hillside
Fault 10			F	20	Kdr	500			N40E	10			X	5	35	X			X	Hillside

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Sheet 13 of 13

TCEQ-0585-Table (Rev. 10-01-04)

SECTION 6.0

GEOPHYSICAL SURVEYS

EGA

Environmental Geophysics Associates

2000 Cullen Avenue, Austin, TX 78757 · Mobile-832-368-4004
E-mail: ega@pdq.net · Website: www.egatx.com

Geophysical Surveys Report
Texas State Highway (SH) 45
Southwest Project, South Austin

December 2014

Prepared for:
SWCA Environmental Consultants
6200 UTSA Blvd., Suite 102
San Antonio, TX 78249
Geoscience Firm Registration No. 50159

Prepared by: *Mustafa Saribudak, Ph.D., P.G.*
Principal Geophysicist-Geologist

1.0 Site Location and Background

Environmental Geophysics Associates (EGA) conducted geophysical surveys for the proposed State Highway (SH) 45 Southwest (SW) project from State Loop 1 (SL 1; MoPac) to Farm-to-Market (FM) 1626 through Travis and Hays Counties, Texas; the study area for the proposed project is shown on Figures 1 and 2.

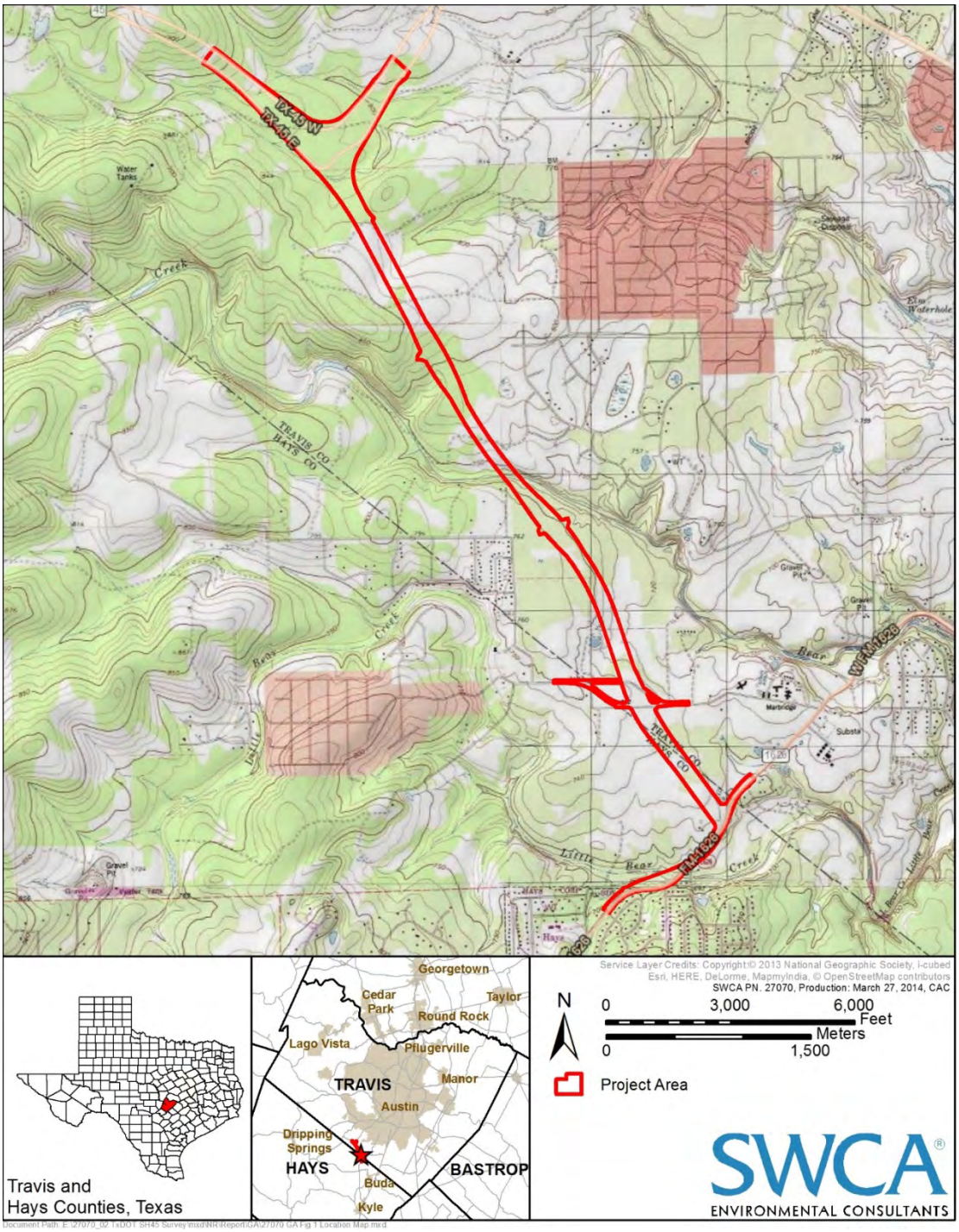


Figure 1. Study area showing the proposed SH 45 SW route in south Austin, Texas.

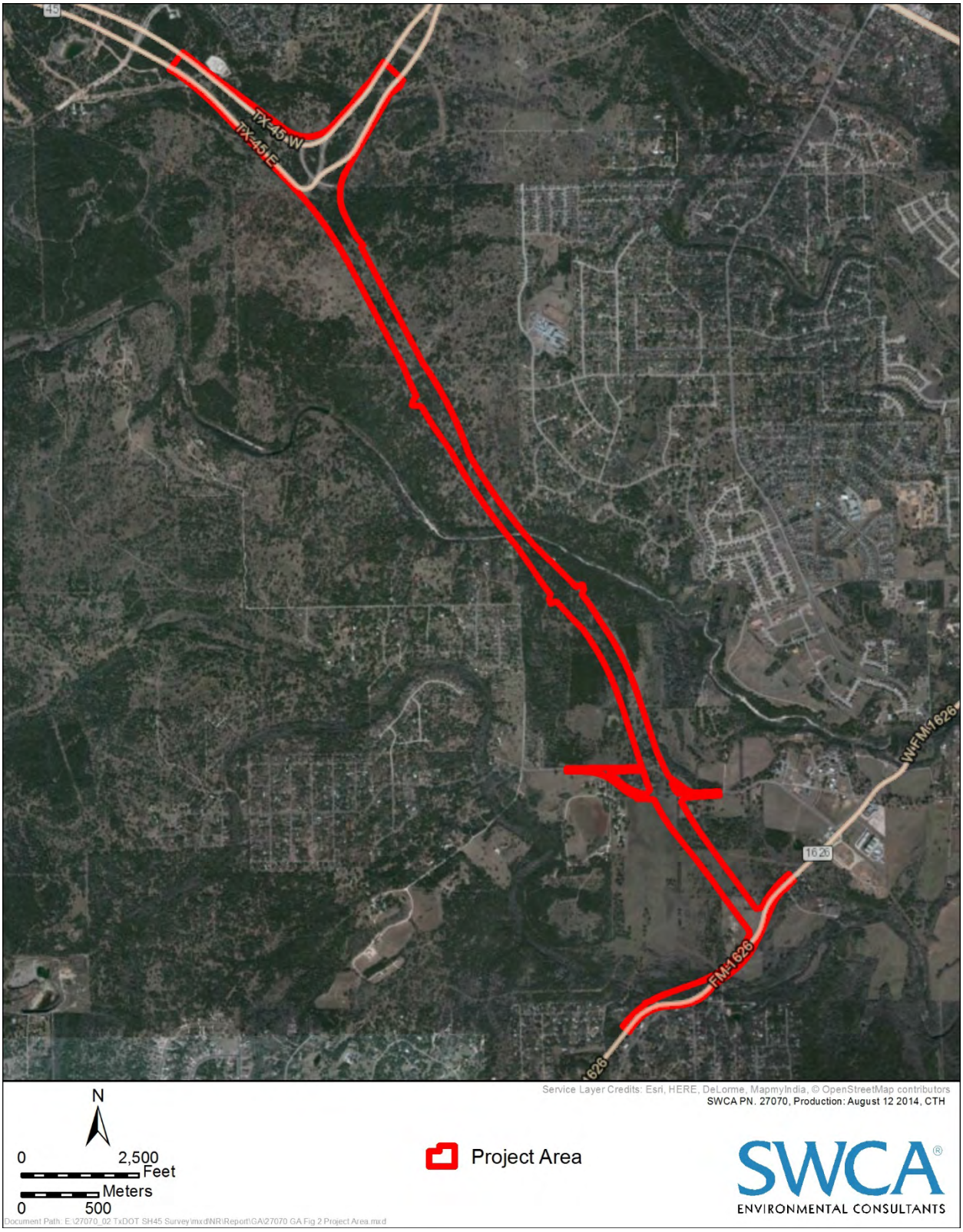


Figure 2. Aerial photograph of study area.

Geologic Assessment Figure 9, Maps 1-12 provide the proposed ROW, the location of the geophysical survey centerline, and potential karst features in the project area such as F18 (Cow Pattie Cave), F23 (Hat Sink), F58, and F110 (Jubilee Cave).

2.0 Site Geology

The local geological maps of the study area, on which the ROW of SH 45 is superimposed, are presented in Figure 3 (Hauwert, Nico M., 2009). Based on these maps, the SH 45 ROW crosses the Balcones Fault Zone (BFZ), which includes Lower Cretaceous Limestone units, which are divided into Kainer and Person Formations of the Edwards Group, which is dissolution-modified, faulted limestone and have a well-developed karst system. Del Rio Clay is the impermeable unit that overlies the Edwards Aquifer across the study area.

Figure 3. Regional geology (from Nico Hauwert, 2009).

The Edwards aquifer consists of approximately 450 ft of limestone, dolomite, and evaporate (primarily anhydrite/gypsum. The Kainer and Person Formations are subdivided into informal members, which were deposited in shallow to very shallow marine waters (Rose, P.R., 1972).

The following geological information is taken from above-mentioned references: The thickness of Kainer Formation, which includes Basal Nodular, Dolomitic, Kirschberg Evaporite and Grainstone members in ascending order, and ranges from about 260 to 310 feet in the study area. The lithology of the Kainer Formation includes marine sediments consisting of mudstones with evaporates.

The Person Formation, which consists of Regional Dense, Leached and Collapsed, and Cyclic and Marine members in ascending order, is about 170 ft thick in the study area. The base lithology of the Person Formation is a dense mudstone, which underlies layers of collapsed breccias, mudstones, and limestone.

Geological maps of the proposed SH 45 (Figure 3) indicate about ten (10) faults crossing the ROW, juxtaposing the Edwards Aquifer units with the overlying Del Rio Clay and among themselves.

3.0 Purpose of Geophysical Surveys

Environmental Geophysical Associates (EGA) performed geophysical surveys (two-dimnensional [2D] and three-dimensional [3D] resistivity and natural potential [NP]) along the entire length of the ROW of the proposed SH 45 SW route. The width and the length of the highway are about 500 feet and 3.5 miles, respectively.

The purpose of the surveys is to locate karstic features, such as caves, voids, sinkholes, and faults, which may be present beneath the proposed highway in the study area.

4.0 Two-Dimensional (2D) Resistivity Method and Field Survey Design

The 2D resistivity method images the subsurface by applying a constant current in the ground through two current electrodes and measuring the resulting voltage differences at two potential electrodes some distant away. An apparent resistivity value is the product of the measured resistance and a geometric correction for a given electrode array. The geometric factor incorporates the geometric arrangement of the electrodes and contributes a unit length, giving apparent resistivity values in units of ohm-meters (Ω-m). Resistivity values are highly affected by several variables, including the presence of water or moisture, and the amount and distribution of poor space in the material, and temperature.

Based on our experience on the Edwards Aquifer, the expected resistivity for weathered limestone varies between 50 to 300 Ω-m, while fresh limestone is expected to produce a range of values between 350-10,000 Ω-m and more. Del Rio Clay, which is the impermeable unit that overlies the Edwards Aquifer, has a range of resistivity values of 1 to 20 Ω-m. The presence of moisture or groundwater reduces resistivity values. The presence of air-filled caves causes highest resistivity values. But it is rarely that caves are purely filled with air. A variety of

sediments accumulate in caves and can be preserved more or less intact for long periods of time (Palmer, 2007). Presence of sand and gravel and clay deposits, mineralization, faults and fractures, perched water in caves are the rules rather than the exception. Clay-filled caves cause low resistivity values.

We acquired 2D resistivity data along the 3.5 mile profile using an Advance Geosciences, Inc. SuperStingR8 resistivity system. The resistivity array consisted of a 56-electrode passive cable (4 cables with 14 electrode take-out) spaced at 5 feet intervals and connected to stainless steel electrode stakes. The resulting profile length of 275 feet was moved in a 25% (1 cable with 14 electrode take-out) roll-along type array to maximize linear coverage.

Appropriate quality assurance/quality control procedures such as testing contact resistance before data collection was performed for each profile segment. Contact resistance measures the resistance to current flow at electrodes caused by imperfect electrical contact with the earth. Poor data quality or anomalous data can result from high or highly variable electrode contact resistance along a profile. To decrease the effect of contact resistance along each profile, we used a saltwater solution at each electrode before the contact test was performed. The solution volume was sufficient to reduce electrical resistance at the contact between the probe and surrounding surface soil but insufficient to penetrate underlying soils and impact resistivity testing results.

Current was applied to the subsurface using a mixed array (dipole-dipole and Schlumberger) roll-along survey in order to cover the entire survey length and maximize coverage. This arrangement utilizes multiple measurements on four electrodes: one pair induces a potential field by applying current to the subsurface and a second pair measures this potential some distance away. The depth investigation in the middle of the original survey length was about 65 feet.

The mixed array of dipole-dipole and Schlumberger techniques is more sensitive to horizontal and vertical changes in the subsurface, respectively. With the use of mixed array, we collected almost twice as many resistivity data points as opposed to dipole-dipole or any other choice of a single array technique, which is important in order to get high quality and high resolution resistivity data.

The SuperstingR8 handled the following tasks in the field: auto-ranging of current and voltage to maximize signal levels, data stacking with standard deviation and automatic switching of all electrode geometries with the Switchbox56 system.

4.1 Two-Dimensional Resistivity Data Processing

We analyzed the 2D resistivity data using Advanced Geosciences, Inc. EarthImager 2D Resistivity and IP Inversion software. This program solves for the best fitting smooth model solution from a series of subsurface apparent resistivity data. Topographic correction obtained from LIDAR-derived DEM were applied to the electrode positions to increase the accuracy of the final inverted model. Resistivity modeling begins with an initial model based on the average raw data value, followed by iterative forward and inverse modeling. During these iterations, the software compares the resulting synthetic data from a forward model to the measured results, and iteratively varies the inverse model resistivity values to decrease the misfit between the model result and measured data. If model convergence is not achieved by an RMS error of less than

10% and L2 close to 1, then a small amount of misfit data is removed and the model is started over (Advanced Geosciences, Inc., 2013).

2D resistivity imaging data is presented as a colored 2D electrical image of subsurface (i.e. a vertical cross section of the distribution of subsurface resistivity). Such a display section indicates low, medium, and high resistivity areas and the structural configuration of the subsurface geology. A topographic correction was applied to the resistivity data whenever necessary. Based on our 14 years of experience working with resistivity data, we like to indicate that all range of resistivity values (low to high) can cause caves and voids. However, purely air-filled cavities cause high resistivity anomalies whereas clay-filled caves are the source of low resistivity anomalies. But it is rarely that caves are purely filled with air. A variety of sediments accumulates in caves and can be preserved more or less intact for long periods of time (Palmer, 2007). Presence of sand and gravel and clay deposits, mineralization, faults and fractures, perched water in caves are the rules rather than the exception.

Our experience ((Saribudak, 2011a, b, Saribudak, 2012, Saribudak et al., 2012, Saribudak et al., 2013a, b) demonstrates that the resistivity method is not always a reliable predictive technique, but is useful in karst terrains to cover large areas quickly and, the merits of integrating other geophysical techniques, along with the resistivity imaging, in order to reduce the ambiguity in the interpretation are evident,

We present the roll-along resistivity data in sections of about 1000 feet or so in this report, unless otherwise reported.

We should point out that horizontal and vertical resolutions of the resistivity data is about half of the electrode spacing, which is 2.5 feet. In other words, the resistivity data collected for this study do not detect voids less than 2.5 feet.

.5.0 Three-Dimensional (3D) Resistivity Method and Field Survey Design

Since all geological structures are 3D in nature, a fully 3D resistivity survey using a 3D interpretation model should in theory give the most accurate results. However it has not reached the level where, like 2D surveys, it is routinely used. The main reason is that the survey cost is comparatively higher for a 3D survey of an area which is sufficiently large.

We performed 3D resistivity surveys at 4 features identified during karst field surveys by SWCA. These features are: Cow Pattie Cave, Hat Sink, and Feature 58a which are located in the northern section of the ROW (north of Bear Creek). Jubilee Cave is located to the south of the Bear Creek (see Geologic Assessment Figure 9 for locations of these features).

We established multiple parallel resistivity profiles at each site, which are spaced 15 feet, crossing these potential karstic features. We used the same type of array (mixed of dipole-dipole and Schlumberger) that we used in the 2D resistivity surveys. The electrode spacing was also maintained at 5 feet.

5.1. Three Dimensional Resistivity Data Processing

We combined individual resistivity profiles from each of the four features into one 3D resistivity data file and processed using 3D EarthImager software which is commercially available from Advanced Geosciences Inc (AGI). AGI Earth Imager 3D is a Windows-based computer program that interprets three-dimensional (3D) electrical resistivity data, and produces 2D (sections), fence diagrams and 3D (volumes) inverted resistivity images that reveal the sought-after targets and subsurface geology.

We took the most western line of resistivity data as a starting point (zero station) and created a 3D file with 15 feet profile spacing. Thus the original 3D view that we obtained for these features was from east to west.

6.0 Natural Potential Method and Field Survey Design

Natural electrical (NP) currents occur everywhere in the subsurface. In seepage or cave investigations, we are concerned with the unchanging or slowly varying direct currents (D.C.) that give rise to a surface distribution of natural potentials due to the flow of groundwater within permeable materials (Lange and Kilty, 1991; Lange, 1999; Vichabian and Morgan, 2002; Saribudak, 2010; and Saribudak, 2011). Differences of potential are most commonly in the millivolts range and can be detected using a pair of non-polarizing copper sulfate electrodes and a sensitive measuring device (i.e. a voltmeter). It should be noted that water movement should be present within or surrounding a cave in order to determine a void or cave location. Positive and negative NP values are attributed to changes in the flow conditions and the resistivity distribution of the subsurface. The source of NP anomalies can be also due to changes in topography, soils and rock conditions. It should be noted that NP measurements made on the surface are the product of electrical current due to groundwater flow and the subsurface resistivity structure. NP anomalies do not provide information on the depth of their sources. Figure 4 shows a schematic view of a cave and its corresponding positive NP anomaly. It should be noted that karstic features may also cause complex (positive and negative, and combination of positive and negative) NP anomalies.

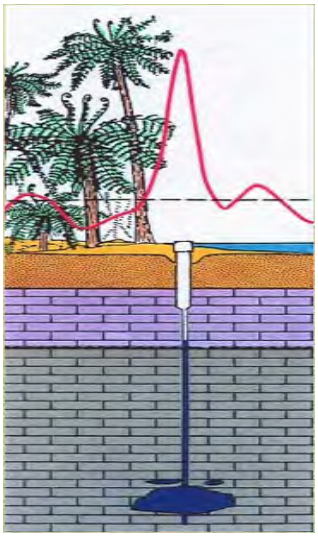


Figure 4. Schematic view of a cave and its corresponding NP anomaly.

An NP survey involves base station and roving electrodes. Electrodes are about 3 inches in diameter and 6 inches tall. The base station is connected to the roving station on a reel. The reel may have up to several thousand feet long electrical wire. A voltmeter is used to measure the subsurface electrical field between the base station and the roving electrodes. The measurement unit was in milliVolt (mV).

We used just two base stations 1000 ft apart. We placed our first base electrode at 1000 and second base electrode at 3000 ft north of the zero (0) station. We collected readings in the southerly direction back to 0ft, then return to base at 1000 feet to. Next we collected data from 1000S-S stands for south- to 2000N-N stands for north. At 2000N we recorded 4 holes (a surrogate base station). Then we returned to base 1000S to tie up the NP readings.

We advanced to a second base station, previously installed with its own reference electrode, at 3000N. We sampled this base and collect data back to 2000S, sampling all 4 holes at that station. Then we returned to 3000N and sampled that base as usual. Then we advanced northward to 4000N and make another of 4 holes and sampled them. Thus we have covered 4000 ft of line with just two original bases.

We established base stations locations and planted base station electrodes the day before we started collecting data. to minimize start-up drift. After having planted the base electrode as deeply as possible in the hole, we covered it with wet sods and reflecting tarp. All these preparations for the base station were to minimize start-up drift. Then we clipped the wire from base station to the wire on the reel, which is, in turn, we connected it to the voltmeter. We dug four holes around the base stations to read the ambient field and recorded the millivolt values and their corresponding time. For the 3.5-mile line, we placed the original bases as above at 1000, 3000, 5000, 7000, etc., feet and repeated the same survey design as we described above.

NP readings were made in a foot-long shallow hole, which were dug perpendicular to the strike of the alignment, in soil by utilizing standard Copper/Copper Sulfate 3-inch-diameter non-polarizing electrodes with a Fluke Model high-impedance multimeter connected through a reel of 2000-ft wire. Three readings in each hole were averaged to characterize voltage at each station.

We also collected NP data at four features: Cow Pattie Cave, Hat Sink, Feature 58a and Jubilee Cave. We established only one base line at each site, because the lines were much shorter, and we repeated the NP data collection along the same resistivity profiles with station spacing of 10 feet or less. The purpose of these NP surveys to determine the horizontal extension of the NP anomalies at four sites.

6.1 Natural Potential (NP) Data Processing

There no commercially available NP geophysical instrument in the geophysical market. For this reason, we developed a NP system a decade ago with the help of Mr. Art Lange, who is one of the NP pioneers in the USA.

We recorded NP data at each station along the profiles, and we returned to the base station few times a day. The purpose of the recording NP readings at the base station was to determine the drift values, which may be caused by the variation of the heat from morning to the late afternoon,

or natural telluric currents, which can arise from worldwide lightening storms, sunspots and magnetic storms.

We corrected the NP data using EGA proprietary software for the drift adjustment. We then transferred the data into our Geosoft Mapping Software in order to filter out the erratic readings using digital filtering options, such as high, or low. We also applied "regional removal" correction whenever it was necessary. This filtering, either applied manually or using digital filtering of Geosoft Software, removed the long-wave effect of the electrical ambient field, which may be caused by regional geology, hydraulic gradient, or cathodic pipe effect, etc.

7.0 Geophysical Case Study-Flint Ridge Cave

We conducted resistivity and NP surveys at Flint Ridge Cave in 2007 while we were doing geophysical surveys for Lower Colorado River Authority for their transmission poles.

Flint Ridge Cave is located outside of the SH 45 geophysical survey line near station 11,000 feet. The cave occurs in Kainer Formation of Kirschberg and Dolomitic members (see Figure 5). The cave was studied by George Veni and Associates in 1999. Depth and map views of the cave are shown in Figure 5, which are reproduced from Jenkins et. al., June 1984-December 1999. The cave starts with an entrance-sinkhole and trends in multiple directions with multiple rooms.

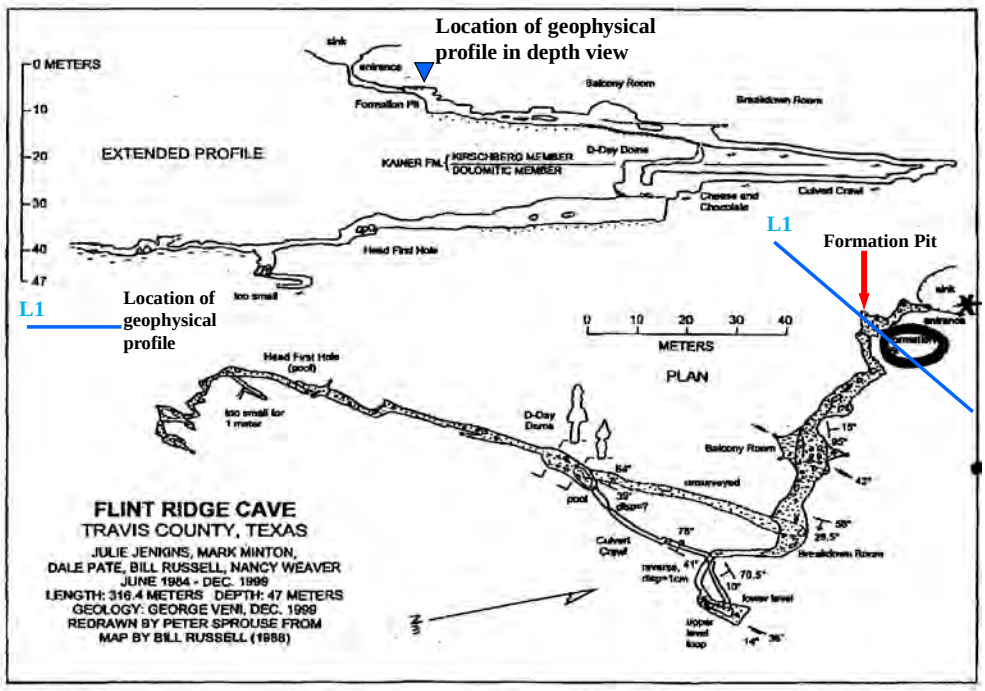


Figure 5. Site map showing the depth and mapview of Flint Ridge Cave. Note that where we conducted the 2007 resistivity and NP surveys (blue line with denotation L1), the top of the cave at a benchmark of "Formation Pit" is about 10 feet below the surface.

NP data collected along the profile L1 is given in Figure 6. A benchmark location (Formation Pit) is shown on the profile for reference purposes. The NP data, although show several

anomalies starting about 70 feet to the east, displays a steep downward gradient, which could be caused by a fault.

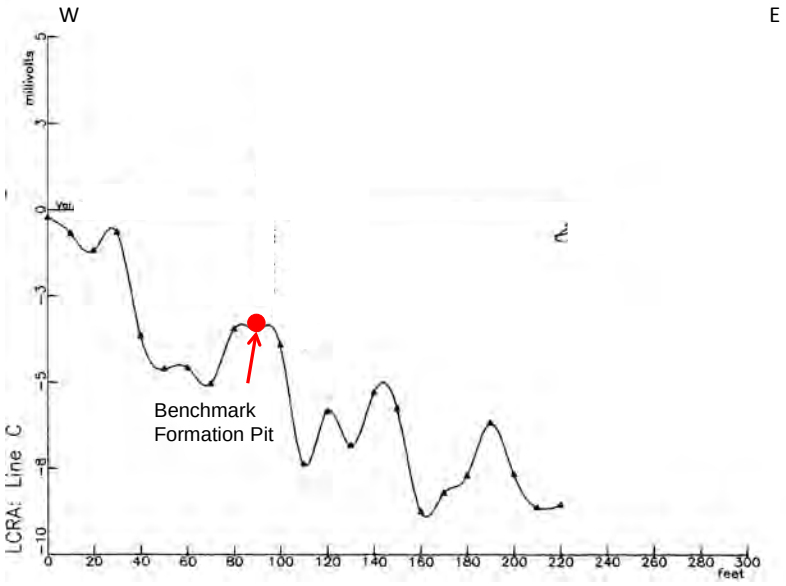


Figure 6. NP data across Flint Ridge Cave (note the location of Benchmark (Formation Pit). The Flint Ridge Cave map indicates a chamber at about 10 feet below the surface at station 85 feet. Note the steep downward gradient of the NP data towards east. This gradient change could be due to a fault.

Resistivity data show high resistivity and low resistivity anomalies along the profile. The high resistivity values with red and yellow colors between stations 75 and 100 feet (i.e., 1000 to 10000 Ohm-m) may indicate a fracture or fault. Note that Flint Ridge Cave shows a cave chamber beneath the benchmark of Formation Pit (Figure 7). The top of the chamber is about 10 feet deep from the surface and its corresponding location is shown on the resistivity data with a white-filled circle. It is important to point out that this section of the Flint Ridge Cave is located in medium-ranged resistivity values (i.e., 300 Ohm.m), not high as it is expected from purely air-filled cavities.

We removed the high gradient component (regional) of the NP data manually. We presented the residual NP data beneath the resistivity data (Figure 7). The highest NP data (up to 3 mV) correlates well with the location of the cave across this profile.

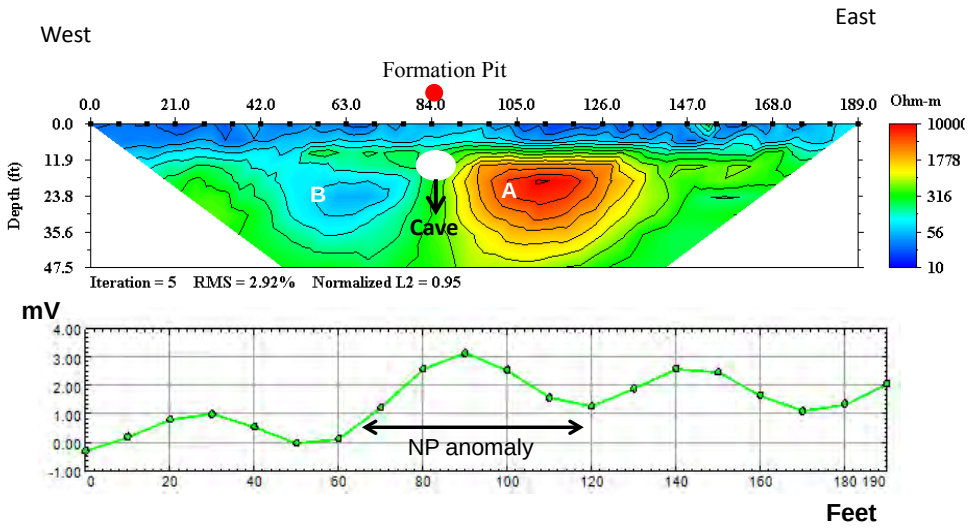


Figure 7. Correlation of resistivity and the gradient-removed NP data across the Flint Ridge Cave. Location of the cave, based on the subsurface data, is shown with a white-filled circle. Note that the resistivity data shows low resistivity values (blue in color) to the west of the cave, whereas high resistivity values (red in color) are present to the east of the cave. The location of cave corresponds to medium resistivity values (green in color). Open circles on the NP data indicate stations.

8.0 Interpretation of Geophysical Data at Four Potential Karstic Features

We collected 3D resistivity data across features along the SH-45 ROW, as known from north to south, Cow Pattie Cave (F18), Hat Sinkhole (F23), Feature 58a, and Jubilee Cave (F110). We also collected NP data along the same resistivity profiles to prepare NP maps. Below we presented the each feature with its resistivity and NP data so that they can be reviewed together.

8.1 Interpretation of 2D and 3D Resistivity Data at Cow Pattie Cave (F18)

The Cow Pattie Cave is located in the northern section of the ROW. It is near to the resistivity/NP station 17,000 feet. We established four 2D resistivity lines (A, B.C and D) starting from west to east, respectively. The spacing between profiles was 15 feet, and the station spacing between electrodes was 5 feet. We presented first four 2D resistivity profiles and the 3D resistivity data, respectively. We are aware that 2D and 3D resistivity software has its own pitfalls in terms of representing the subsurface correctly. 2D resistivity data gives highly detailed resistivity variations of the subsurface whereas 3D data averages the resistivity values, and emphasize the most significant anomalies.

Figure 8 displays the two resistivity profiles of A and B, respectively. Both profiles indicate a low-resistivity anomaly beneath the Cow Pattie Cave. But the size and geometry of this resistivity anomaly is bigger on Line A than Line B. This low resistivity anomaly could be caused by the Sinkhole. We also observed a significant resistivity anomaly at between stations

180 and 200 feet, where low resistivity and high resistivity values are juxtaposed. These types of anomalies can be explained by a significant fracture or fault or a karstic feature.

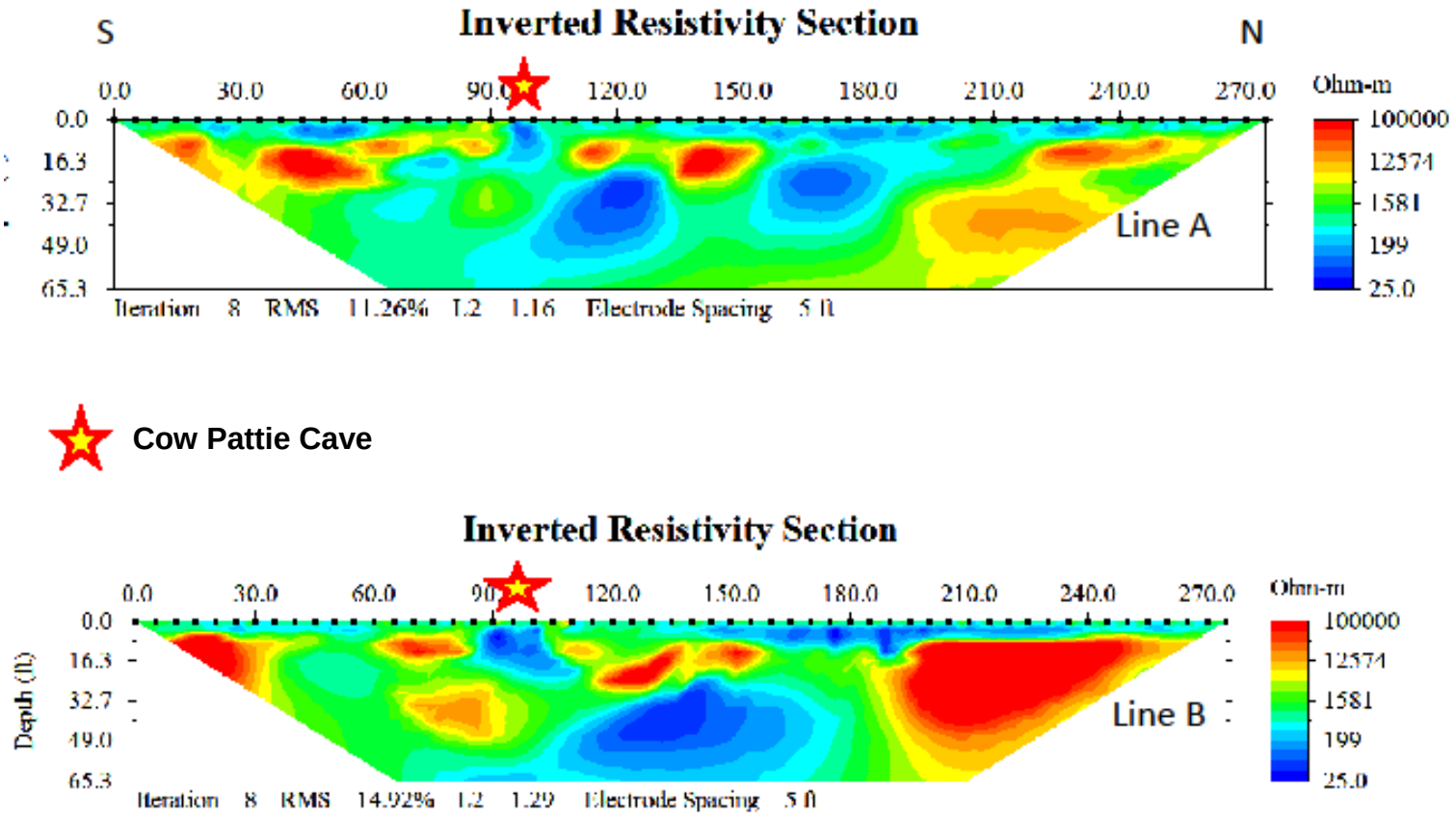


Figure 8. Resistivity data along profiles A and B. Lines A and B are located to the west of the Cow Pattie Cave. Note that there is a low resistivity anomaly beneath the Cow Pattie Cave, which becomes more defined on Line B, and dips towards the north. This low resistivity anomaly is probably caused by the fill material. Two more observations: 1) south-dipping limestone layers beneath the sinkhole; 2) there is a sharp contact between the low resistivity (blue in color) and high resistivity values (red in color) at about station 190 feet. This significant variation in resistivity could be due to a fracture or fault, and is very similar to the resistivity anomalies we discussed on the Flint Ridge Cave.

Figure 9 provides the resistivity profiles from Line C and Line D. Both these data sets are located to the west of the Sinkhole and do not indicate low resistivity values (blue in color) as observed on Line A and Line B. However, they still indicate a syncline-type limestone layers beneath the Sinkhole. Most importantly, there is a sharp resistivity contact at about station 200 feet on both profiles, as observed on Lines A and B.

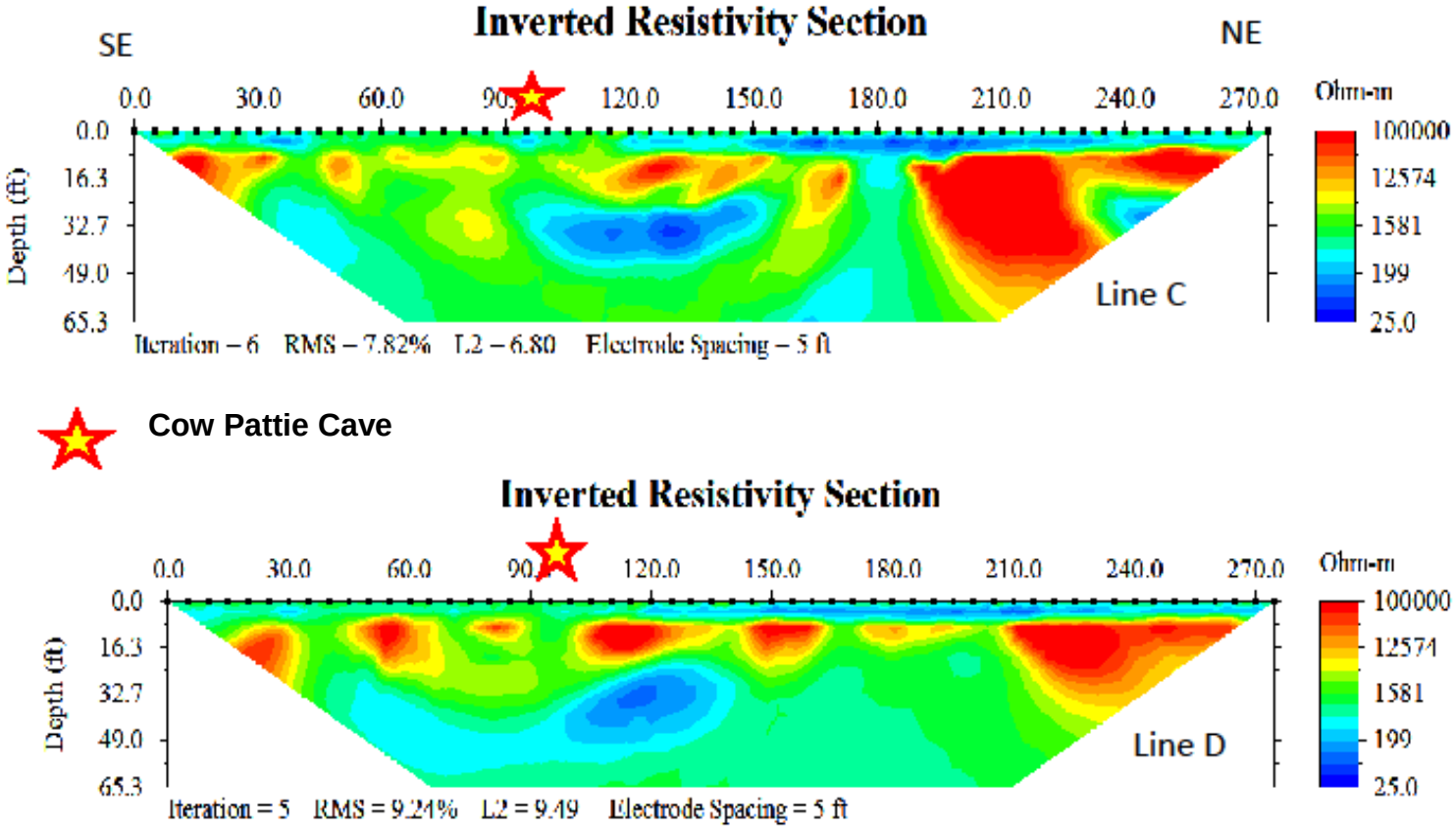


Figure 9. Resistivity data along profiles C and D. Lines C and D are located to the west of the Cow Pattie Cave. Note that there is no low resistivity anomaly beneath the Cow Pattie Cave along these profiles as opposed to Lines A and B. But we still observe south-dipping layers (subsidence-like) in the vicinity of the Sinkhole. More importantly, there is a major resistivity contact at station 200 feet, which could be due to a fault or caustic feature.

We combined the four resistivity profiles and created a 3D diagram given with its own apparent resistivity cross plot (Figure 10). The latter shows the statistical parameters (RMS and L2) of the inversion of the data, which indicates the fit between measured and inverted data. In this case the RMS and L2 vales are 9.5 and 3.6, respectively. These are reasonable parameters and we can say that there is a good fit between the measured and calculated data.

The inverted resistivity image (Figure 10) does not indicate any significant anomaly where the Cow Pattie Cave is located. There are two significant observations that this diagram yields: 1) There is a sharp vertical resistivity change between high (red in color) and medium (green in color) resistivity values at a depth of 30 feet; and 2) there is significant low anomaly between stations 180 and 200 feet, which appears to be sandwiched between high resistivity values (red in color). These observations are correlative with what we rendered on 2D resistivity profiles.

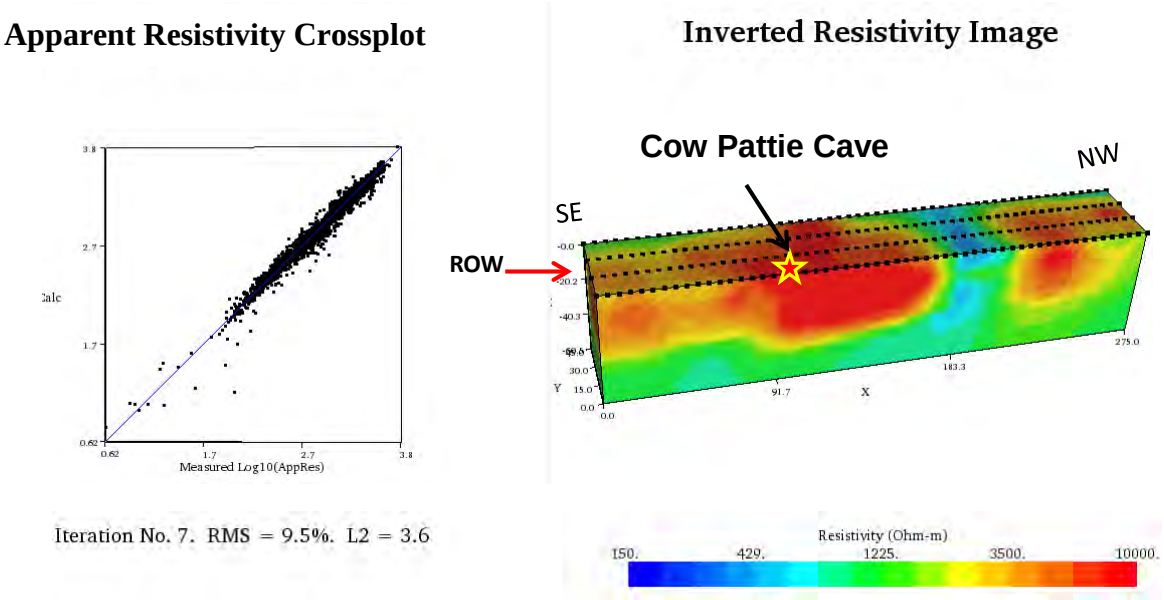


Figure 10. A 3D resistivity diagram and its own apparent resistivity cross-plot at Cow Pattie Cave. Note that the sinkhole is located in high resistivity values, and does not indicate a low resistivity feature as 2D resistivity sections do. A significant low resistivity anomaly is observed between 180 and 200 feet, which could be caused by a karstic feature.

Figure 11 displays the dynamical slices of 3D resistivity data, which indicate similar anomalies as discussed for the 3D block diagram above: 1) the sinkhole does not cause a significant resistivity anomaly; 2) there is a sharp low resistivity anomaly squeezed into high resistivity values between stations 180 and 200 feet. In addition, the slices diagram indicates a sudden resistivity contrast at about 250 feet. We indicated this as a potential anomaly and denoted it as "X."

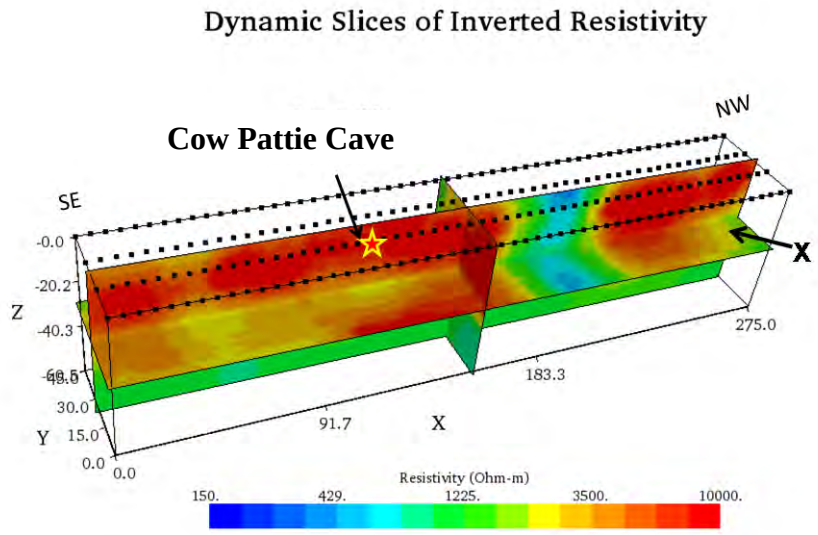


Figure 11. 3D dynamic slices of resistivity data at Cow Pattie Cave. The data does not indicate a significant anomaly in the vicinity of the sinkhole. But a well-defined low resistivity anomaly (blue in color) sandwiched between high resistivity values between stations 180 and 200 feet is significant. Also a sudden transition from high to low resistivity values at about station 250 feet is shown with a letter X (see NP data in Section 8.2).

8.2 Interpretation of NP Data at Cow Pattie Cave

Figure 12 provides the natural potential map for the Cow Pattie Cave site. The NP data was collected along the same 4 profiles of resistivity. We made the following observations on the NP map: 1) the sinkhole is located at station 100 feet, and there is a slight increase on the NP data towards to the north; 2) there is a strong southeast-dipping gradient across the entire map area; 3) there is a well defined east-west trending boundary at about station 175 feet (see Figure 12 and a thick black line on the map). This NP variation could be due to a fault, fracture and/or karstic feature, 3) there is also a high NP anomaly along the profile 45 feet between stations 230 and 265 feet. This is a positive NP anomaly and its highest intensity is 31 mV whereas the background NP value for the sinkhole is about 7 mV. This anomaly is probably caused by a karstic feature.

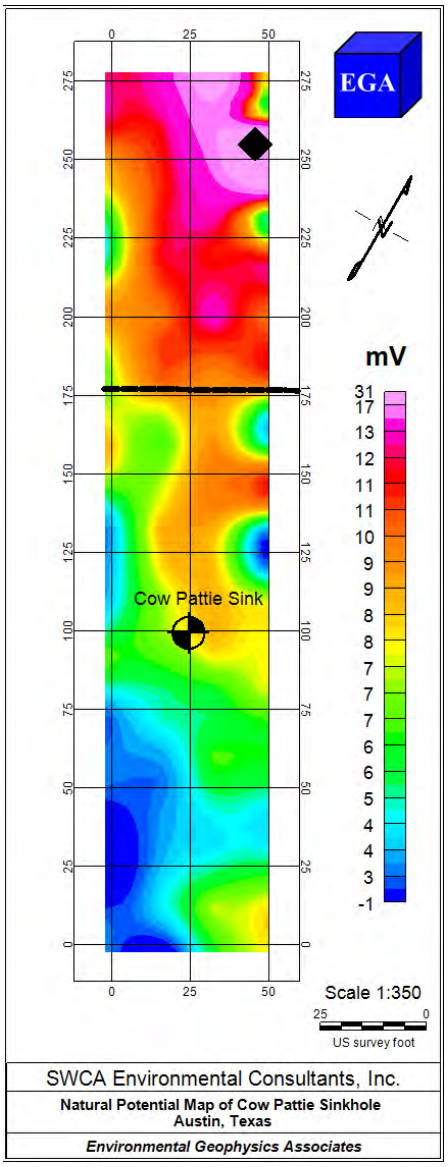


Figure 12. Natural potential map of Cow Pattie Cave. The location of the sinkhole is shown with a circle filled with black and white. There is a sharp east-west trending contact between the medium (green in color) and high (red in color) NP values at station 180 feet. This is the area where the resistivity data indicates a low resistivity anomaly (see Figures 10 and 11). Stations between 230 and 270 feet, where a black-filled diamond figure is shown, we observed the highest NP value (31 mV) in the northwest corner of the study area (see Figures 11 and 13). This anomaly is probably caused by a karstic feature.

Figure 13 provides the NP data along profile 45 feet, which shows a high NP anomaly between stations 230 and 270 feet. This anomaly is correlative with the resistivity data, which is introduced in dynamic slices format in Figure 11.

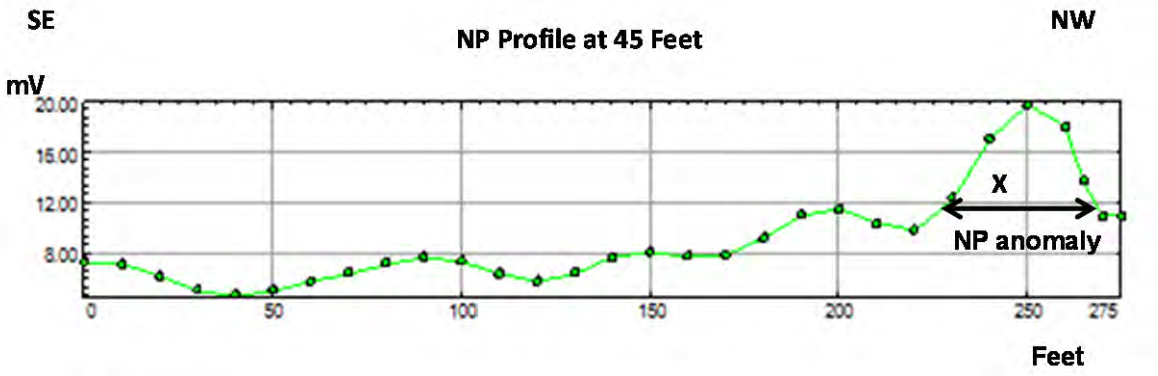


Figure 13. NP data taken along profile 45 feet over the Cow Pattie Cave. The data indicates a well-defined anomaly which could be caused by a karstic feature (see Figure 11 for correlation with the resistivity data).

In summary, NP and 2D and 3D resistivity data correlate well. The NP and 2D resistivity data indicate anomalous values in the vicinity of the sinkhole. They all display strong E-W trending anomaly between stations 175 and 200 feet; and finally the NP data shows a strong positive anomaly between stations 230 and 270 feet. This NP anomaly corresponds to the location of the resistivity anomaly shown with the letter of X on the sliced resistivity diagram of Figure 11.

8.3 Interpretation of 2D and 3D Resistivity Data at Hat Sinkhole (F28)

Hat Sinkhole is located in the northern section of the ROW. It is near to the 16,000 feet station. We established seven 2D resistivity lines. One of the resistivity lines was surveyed along the SH 45 ROW. The spacing between profiles was 15 feet, and the station spacing between electrodes was 5 feet. We first present the ROW resistivity profile with 3 other profiles surveyed to the west (Figure 14).

The ROW resistivity profile, which is the first profile in Figure 14, is located 15 feet to the west of the entrance of the Hat Sink. This profile indicates a low resistivity anomaly, which appears to extend as deep as 30 feet. The other three profiles (West Lines 1, 2 and 3) do not indicate any significant anomaly corresponding to the location of the Hat Sink.

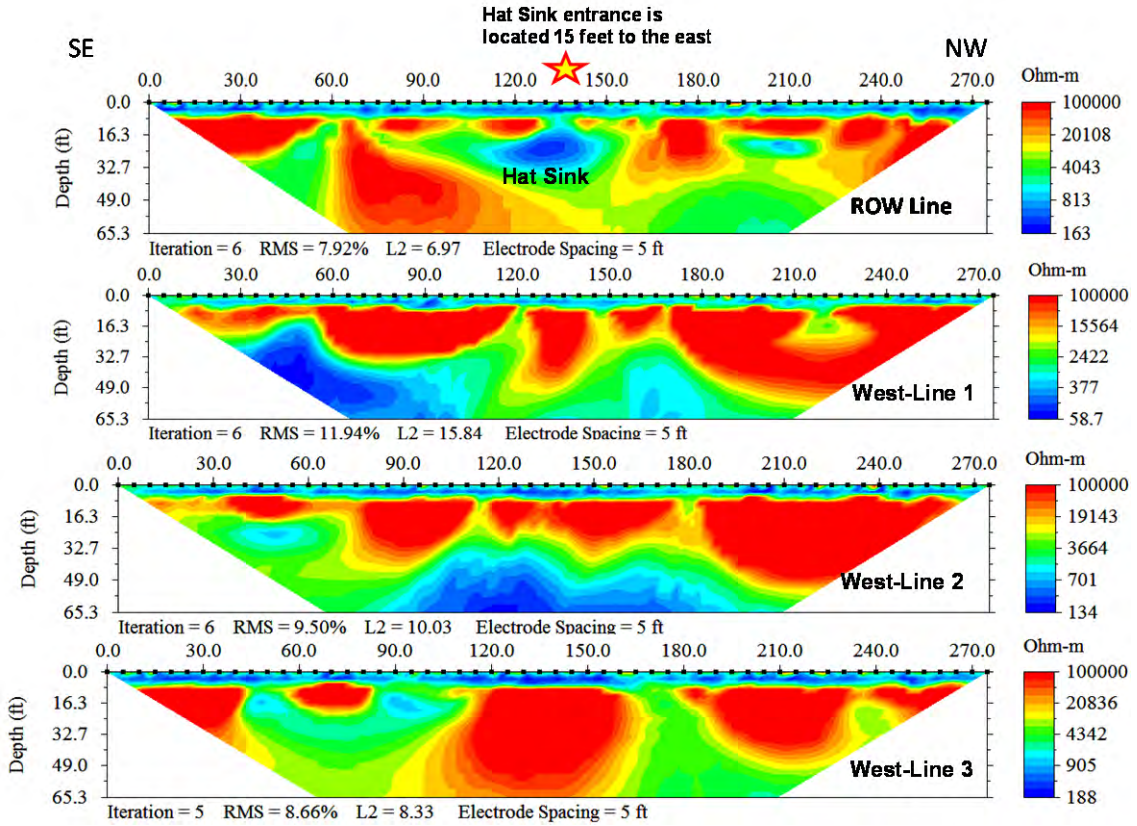


Figure 14. Resistivity data along ROW and 3 other profiles to the west of the Hat Sinkhole. Note that the entrance of the Sinkhole is located 15 feet to the east of the ROW resistivity profile. However the ROW resistivity data shows a well-defined low resistivity anomaly, which could be caused by the lateral extension of the Sinkhole. The rest of the profiles to the west do not indicate any significant anomaly in the vicinity of Hat Sinkhole.

Resistivity profiles below include the ROW resistivity data and 3 other profiles taken to the east of the Hat Sinkhole (Figure 15). As we discussed above, the resistivity data along the ROW indicated a low resistivity anomaly. The resistivity profile across the entrance of the Hat Sink, which is labeled as East-Line 1, indicates a rather well-defined low resistivity (blue in color) anomaly beneath the sinkhole. This anomaly is connected to the surface via a "neck" and flattens out to the south and north at the depth of 30 feet or so. This anomaly, thus, looks like an inverse sombrero, which rightly justifies the name Hat Sinkhole! Two profiles to the east do not indicate any significant anomaly as far as Hat Sinkhole is concerned. In other words, the Hat Sinkhole does not appear to extend further east.

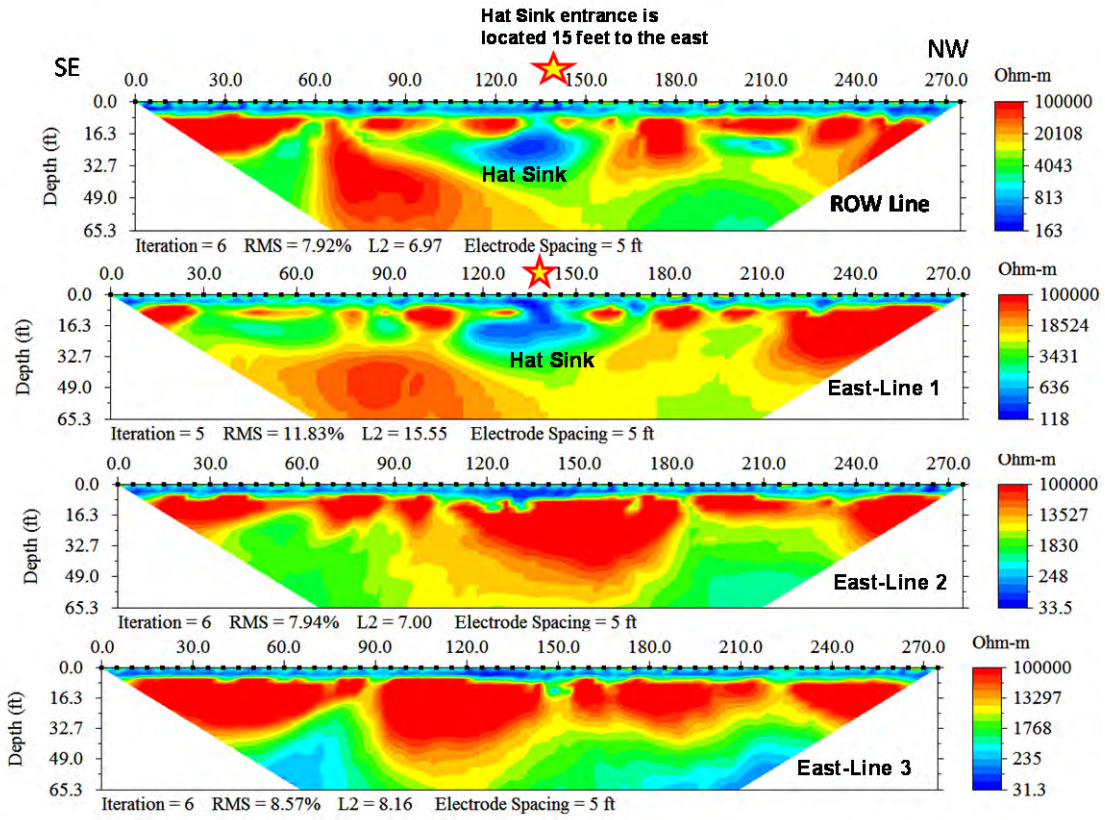


Figure 15. Resistivity data along ROW and 3 other profiles to the east of the Hat Sink. Note that the entrance of the sinkhole is located 15 feet to the east of the ROW resistivity profile, which is Line 2. The resistivity data across the sinkhole (Line 2) indicates a well-defined low resistivity (blue in color) anomaly, which appears to connect to the surface via "neck" and flattens out to the south and north at the depth of 30 feet or so. This anomaly is shaped as an inverse sombrero, which rightly justifies the name given to it. The rest of the profiles further east do not show any similar anomaly.

We combined seven resistivity profiles and created a 3D diagram given with its own apparent resistivity crossplot (Figure 16). The latter shows the statistical parameters (RMS and L2) of the inversion of the data, which indicates the fit between measured and inverted data. In this case the RMS and L2 vales are 11.5 and 5.5, respectively. These are reasonable parameters and we can say that there is a good fit between the measured and calculated data.

The inverted resistivity image (Figure 16) indicates that the sinkhole is located at between high (orange in color) and medium resistivity b (green and light blue in colors) where Hat Sinkhole is located.

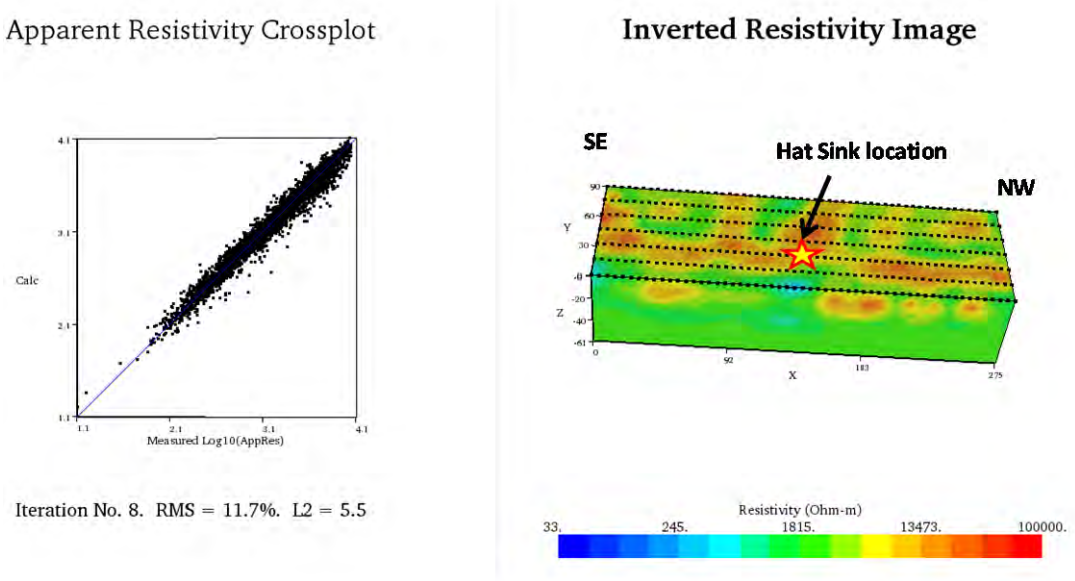


Figure 16. A 3D resistivity diagram and its own apparent resistivity cross-plot at Hat Sinkhole. Note that the sinkhole is located between high (orange) and medium (green) resistivity values**.**

Figure 17 displays dynamical slices of 3D resistivity data from Hat Sinkhole. The sinkhole appears to be located at between high and medium resistivity values. Both the dynamic slices and the 3D diagram (Figure 14) do not show the inverse sombrero anomaly that some of the 2D resistivity profiles explicitly indicated.

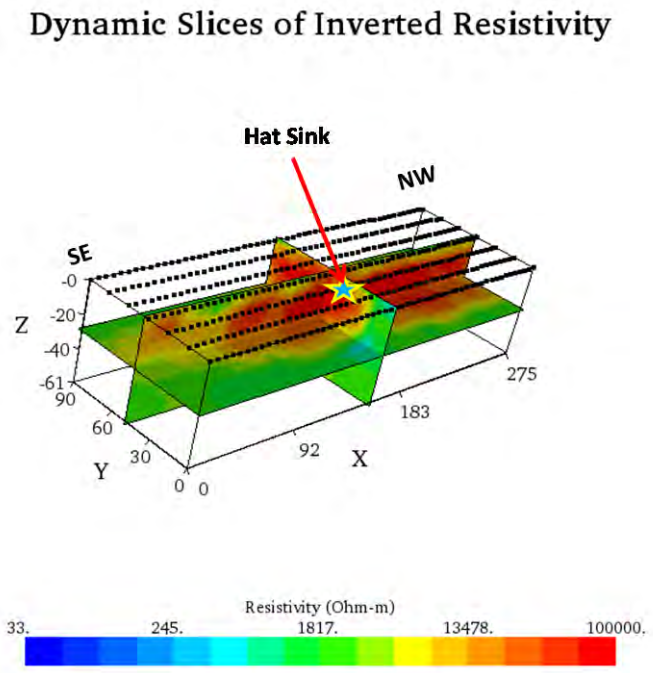


Figure 17. Dynamic slices of inverted resistivity data at Hat Sinkhole. Note that the sinkhole is located between high (orange) and medium (green) resistivity values**.**

8.4 Interpretation of NP Data at Hat Sinkhole

Figure 18 provides the natural potential map for the Hat Sinkhole site. The NP data was collected along the same seven (7) profiles of the resistivity data. We made following observations on the NP map: 1) low and medium resistivity values (blue and green in colors) are separated from high NP values (red and pink in colors) in the north-south direction. Hat Sinkhole is located on the contact of this north-south trend. In the field, we observed an east-west fault crossing the sinkhole at this location. It appears that the sinkhole is formed along this fault; 2) NP values shown with dark blue colors in the northwest section, and with the pink colors in the eastern part of the NP map could be partly also caused by the presence of karstic feature.

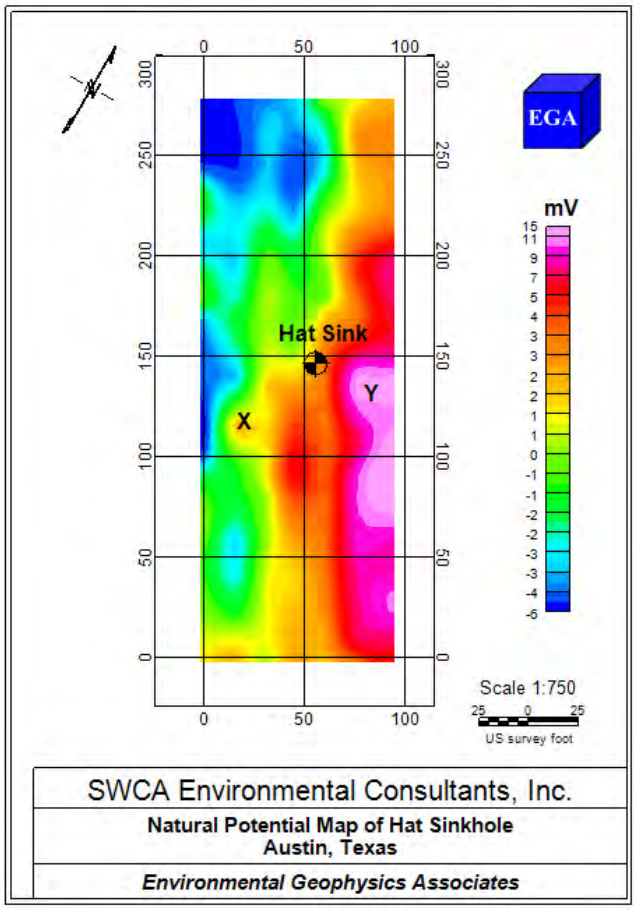


Figure 18. Natural potential map of Hat Sinkhole. The location of the sinkhole is shown with a circle filled with black and white. Note that Hat Sink is located along a north-south boundary between the high and medium NP values. An east-west trending fault crosses the Hat Sink (EGA field observation, 2014). Note the protruding high NP values (orange in color and) to the east at about 115 feet from the baseline in the south, which is also shown with a letter X. Another high NP values (pink in color) stations are observed between 75 and 150 feet, which is marked as letter Y on the map.

Figure 19 provides NP data, which are prepared in profile format, along 15 and 75 feet, respectively. Both profiles indicate high NP anomalies in the vicinity of Hat Sinkhole, shown with letters X and Y. These anomalies could be caused by karstic features and be linked to Hat Sinkhole.

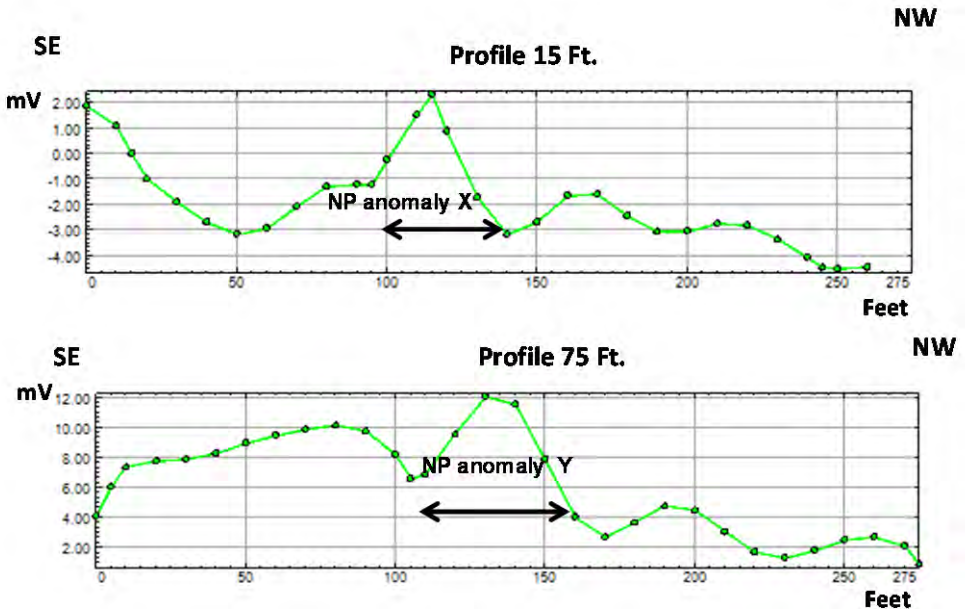


Figure 19. NP data taken along profiles 15 and 75 feet at Hat Sinkhole, respectively. Both data sets indicate high NP anomalies (X and Y) that are located in the vicinity of the Hat Sinkhole. These anomalies could be caused by karstic features and be linked to Hat Sinkhole.

8.5 Interpretation of 2D and 3D Resistivity and NP Data at F58a

Feature F58a is located near station 12,000 feet in the northern section of the ROW. We established six 2D resistivity lines. One of the resistivity lines was surveyed along the SH 45 ROW. We first present the ROW resistivity profile with 2 other profiles surveyed to the east of the ROW (Figure 20).

In the study area, we observed a subsidence between stations 120 and 150 feet along the ROW and the first profile to the east. The observed subsidence corresponds to the contact between low and high resistivity values. East Line 1 profile indicates a syncline-type resistivity structure between stations 75 and 150 feet. There is also a similar anomalous area between stations 180 and 240 feet on Line 1. We do not observe the subsidence-type of anomaly on Line 2; but the anomaly observed on Line 1 appears to be present on East Line 2 profile between stations 180 and 210 feet.

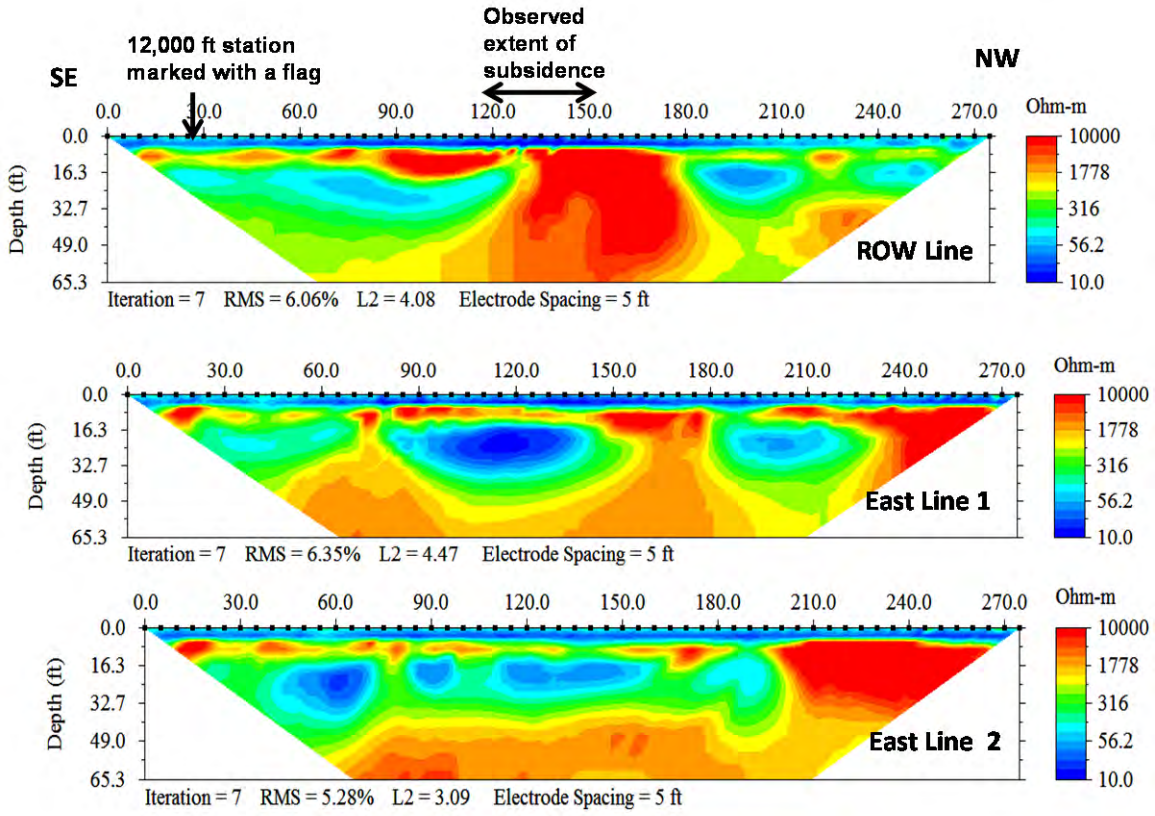


Figure 20. 2D resistivity data along ROW and 2 other profiles to the east of ROW at feature F58a. We observed a subsidence in the study area. We marked the location of it on the ROW resistivity profile. The subsidence area appears to correspond to where highly competent and resistive limestone rock juxtaposed to a low resistive limestone unit. East Line 1 profile shows the subsidence-like anomaly between stations 75 and 150 feet.

We collected three more profiles to the west of the ROW profile, which are named West Line 1, 2 and 3 (Figure 21). ROW profile and Line 1 profile indicates a highly resistive and competent limestone rock in the center of both profiles. This monolithic limestone appears to extent its boundaries further to the southeast and northwest on Line 1. However, Line 2 indicates a low resistivity anomaly in the middle of this limestone unit. The massive limestone observed in the center of the previous profiles (L1 and L2) disappears on Line 3.

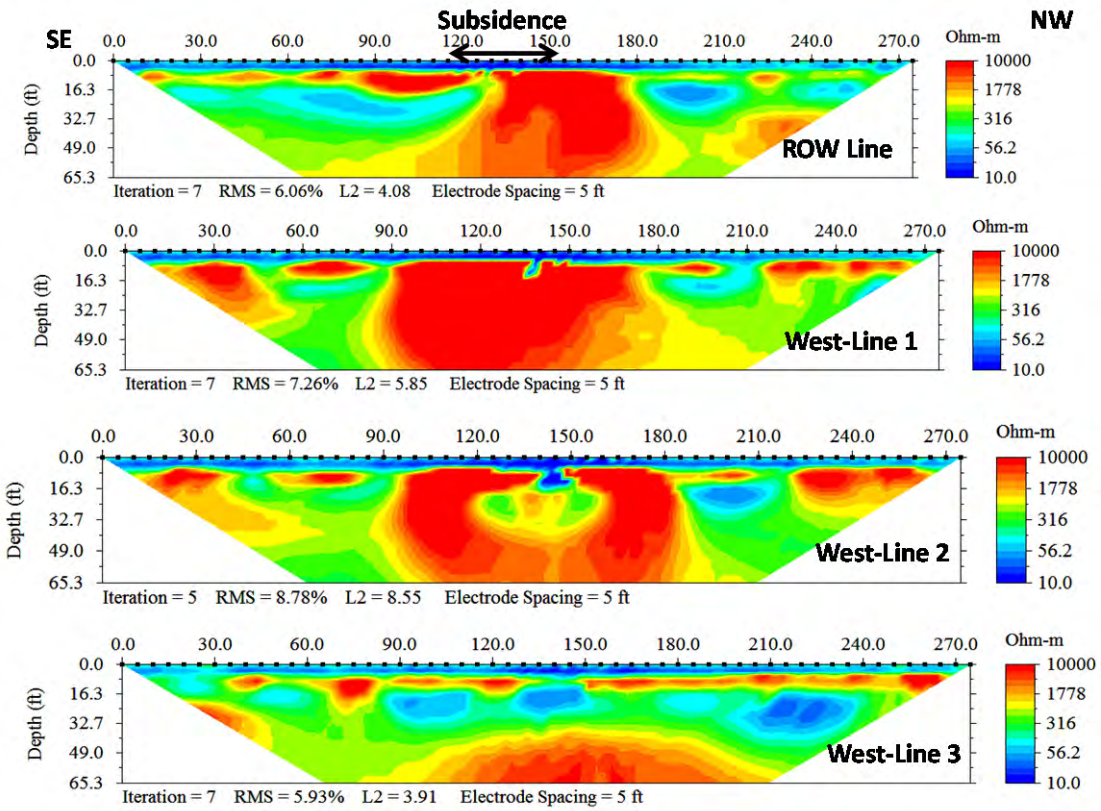


Figure 21. 2D Resistivity data along ROW and 3 other profiles to the west of ROW at feature F58a. We observed a subsidence in the study area. We marked the location of it on the ROW resistivity profile. The subsidence area appears to correspond to where highly competent and resistive limestone rock juxtaposed to a low resistive limestone unit. Line 2 indicates a low resistive area in the middle of monolithic limestone between stations 130 and 150 feet.

We combined six resistivity profiles and created a 3D diagram given with its own apparent resistivity crossplot (Figure 22). The latter shows the statistical parameters (RMS and L2) of the inversion of the data, which indicates the fit between measured and inverted data. In this case the RMS and L2 vales are 4.3 and 0.7, respectively. These are good parameters and we can say that there is a good fit between the measured and calculated data.

The inverted resistivity image (Figure 22) indicates an anomalous area on the map-view of the 3D diagram. This area is shown with high resistive values (red in color), and is located on the ROW and the next profile to the east. We marked the area with yellow lines, which corresponds to the subsidence that we observed in the field. Another significant anomaly is observed on the cross-section of the 3D diagram where a low resistivity value is enveloped by a pair of high resistive values at station 190 feet approximately. This location is marked as “anomaly” on the cross-section view.

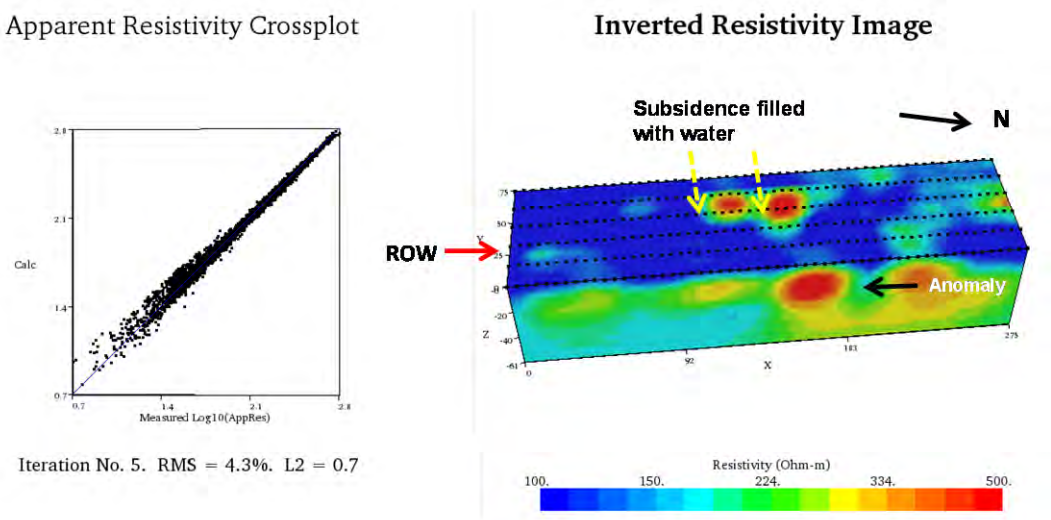


Figure 22. 3D diagram of resistivity data with its Apparent Resistivity Crossplot. The 3D inverted resistivity image shows high resistivity anomalies on the map-view where a subsidence is observed in the field. Another significant anomaly is marked at 190 feet.

Another map and cross-section view of the 3D diagram for the feature F58a is provided in Figure 23. This figure indicates a significant anomaly between stations 140 and 170 feet in the cross-section view where a low resistivity (dark blue in color) infiltrates into a higher resistivity unit (green and red in colors).

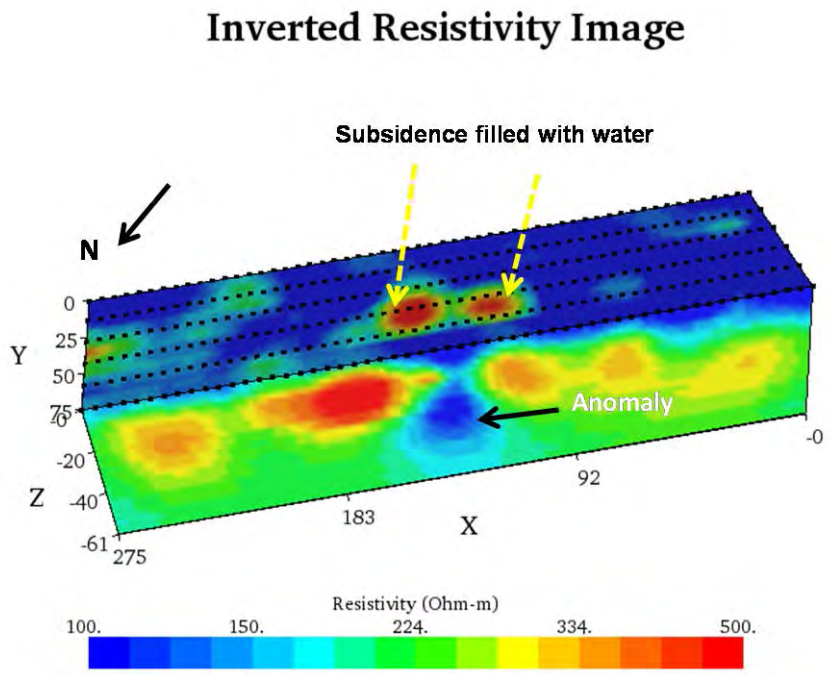


Figure 23. 3D map and cross-sections views from the west direction to feature 58A. In addition to the high resistivity anomalies observed on the map view, there is a significant low anomaly between stations 140 and 165 feet.

Excavation results show a 7-ft thick soil section, which consists of dark brown clay rich loam, which overlies limestone bedrock. The karst feature F58a is, thus, categorized as a non-karst closed depression by SWCA. However, resistivity 2D and 3D, and the NP do indicate anomalies across and in the near vicinity of this karstic feature. The source of NP anomaly across the F58a could be attributed to the abrupt geologic contact between the clay fill material and the limestone, and the infiltration of rainwater through the subsurface. We should note that there was a lot of rain water ponded at the depressed area of F58a during geophysical surveys. Significant resistivity anomalies, caused by karstic features, appear to be located away from the ROW profile, and are deeper than the excavation depth of 7 feet (see Figures 21, 22 and 23).

Figure 24 displays dynamical slices of 3D resistivity data from feature 58a. The subsidence area corresponds to a contact between resistivity low and high. Also there is anomalous area between stations between 190 and 240 feet, which is marked on the section with a letter "X."

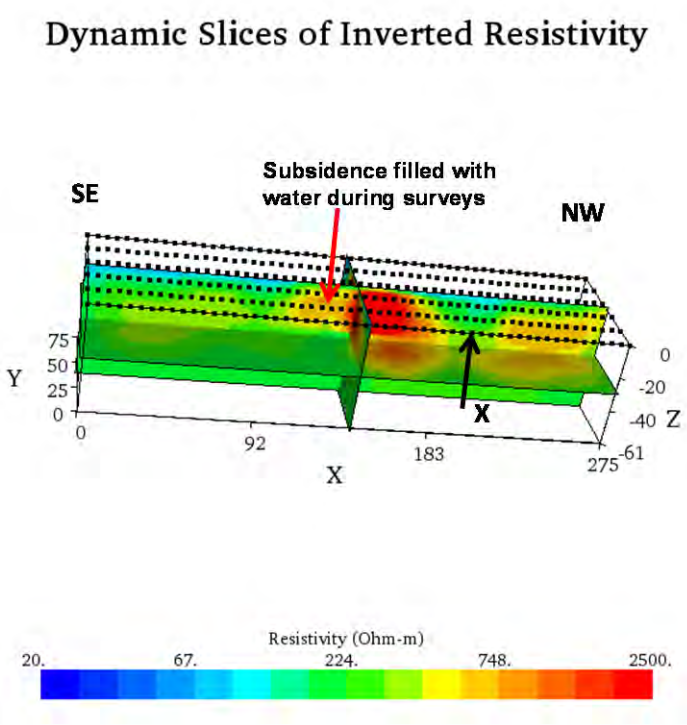


Figure 24. Dynamic slices of inverted resistivity data at feature 58a. Note that the feature is located between high (orange) and medium (green) resistivity values**.**

8.6. Interpretation of NP data across Feature 58a

Figure 25 provides the natural potential map for the feature 58a. The NP data was collected along the same seven (7) profiles of the resistivity data. We made following observations on the NP map: 1) there is a pair of significant NP anomalies, high (red and pink in colors) and low (blue in color), where the subsidence along and across the ROW is observed. Further northwest, linear high NP values shown by the pink color are observed only along line 30 feet. We interpret this linear anomaly changes in the moisture of the soil; 2) there is an anomalous area along the last NP line (line 75) at station 200 feet. We marked the location of this anomaly on the NP map and provided the NP profile on line 90 in Figure 26, which clearly indicate a significant positive NP anomaly between stations 190 and 230 feet.

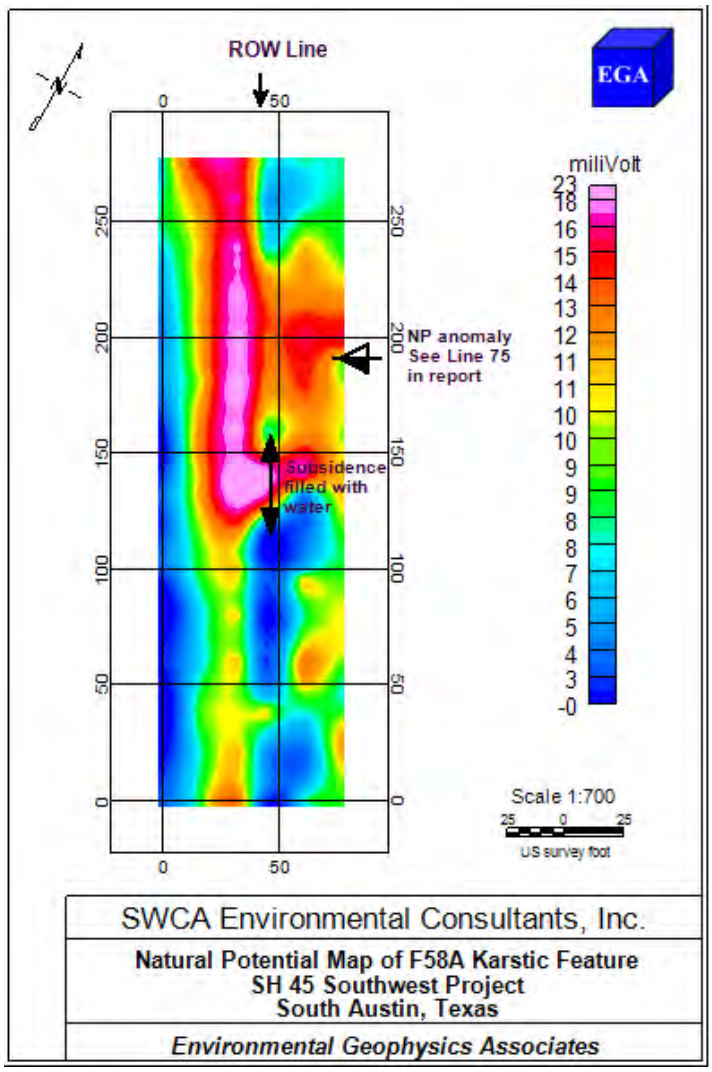


Figure 25. NP map at Karst Feature F58a. Not the presence of high and low NP values juxtaposed where the subsidence is observed along and across the ROW. Another NP anomaly, which is marked with a single arrow, is located along the last NP profile at 75 feet.

Figure 26 provides the NP data on profile format along line at 90 feet, which shows a significant high NP anomaly between stations 190 and 230 feet. The solid green dots on the profile show the sampling stations.

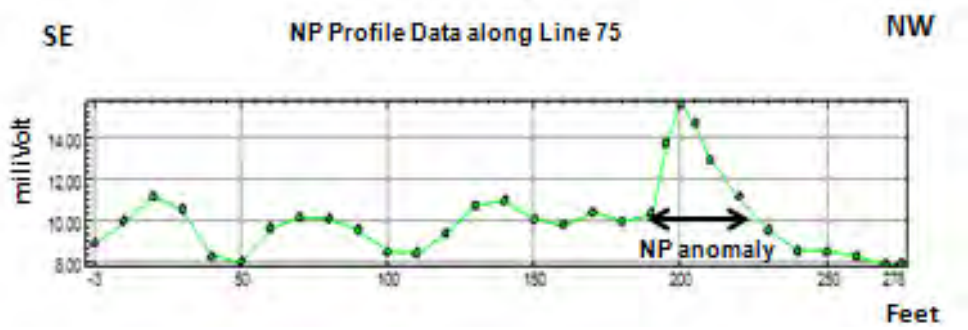


Figure 26. NP data along profile 75 feet. Note the presence of a significant positive NP anomaly between stations 190 and 230 feet.

8.7 Interpretation of 2D and 3D Resistivity Data at Jubilee Cave (F110)

The karst feature F110 is located in the southern section of the ROW. It is near to 9,000 feet station. We collected 2D resistivity data along five profiles. The last profile to the east of the sinkhole merges with the ROW profile at station 180 feet. Below we present the resistivity data along five resistivity profiles. The sinkhole is located between second and third profiles (see Figure 27).

First three resistivity profiles (Line 1, 2, and 3) indicate limestone with low resistivity values (blue in color), which is underlain by more competent limestone with medium and high resistivity values. However, low and underlying high resistive rocks appear to be fragmented along the entire length of first three profiles, especially in the vicinity of the sinkhole. Furthermore, there is a subsidence-like feature between the stations 120 and 150 feet on all first three profiles (Lines 1, 2 and 3). We do not observe this subsidence feature on the last two profiles (Lines 4, and 5). We should also point out that the rocks outcropping in this study area are highly fractured.

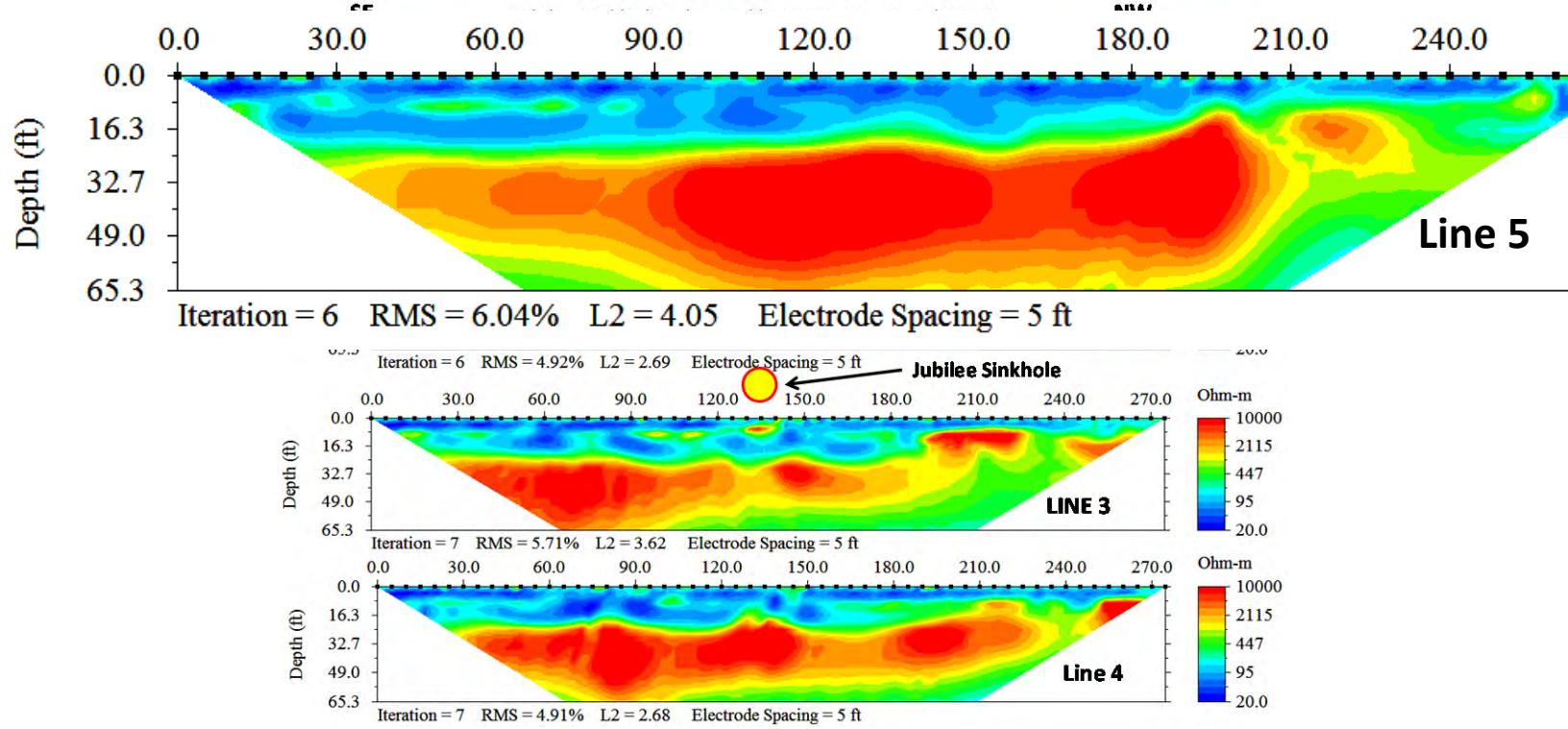


Figure 27. 2D resistivity data along 5 profiles at Jubilee Cave. The ROW profile is located to the west of Line 5 and merges with it at station 180 feet. Note that low and high resistivity values are highly fragmented in the vicinity of the sinkhole. Furthermore, there is a subsidence-like feature between the stations 120 and 150 feet on all first three profiles (Lines 1, 2 and 3).

We combined five resistivity profiles and created a 3D diagram given with its own apparent resistivity crossplot (Figure 28). The latter shows the statistical parameters (RMS and L2) of the inversion of the data, which indicates the fit between measured and inverted data. In this case the RMS and L2 vales are 4.8 and 0.9, respectively. These are good parameters, which indicate a good fit between the measured and calculated data.

The inverted resistivity image (Figure 28) indicates a high resistivity anomaly between stations 120 and 150 feet where the sinkhole is located. This anomaly has geometry of a sphere and is well-defined. Another map-view of the 3D diagram is also provided in Figure 29.

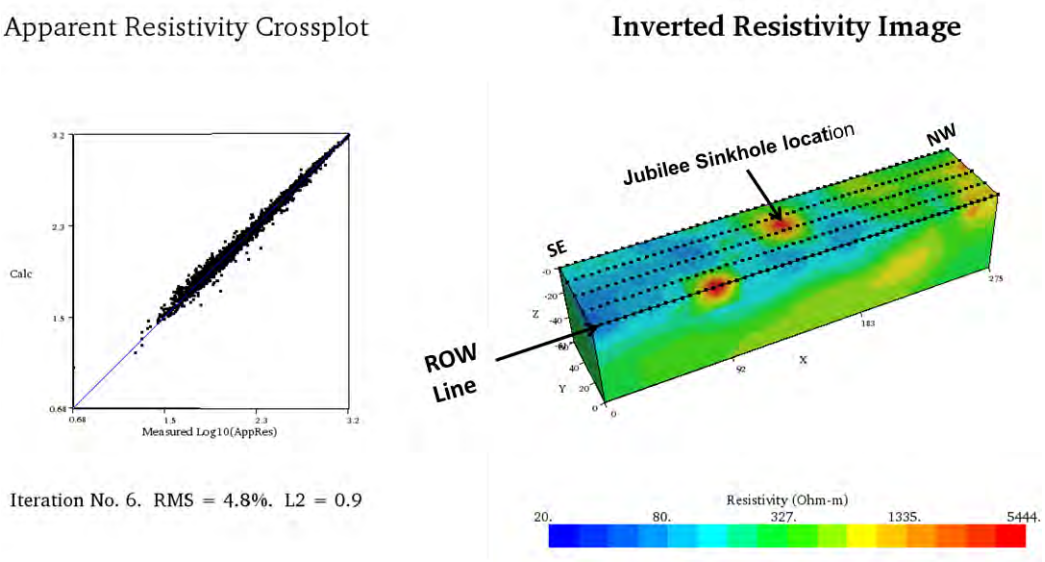


Figure 28. A 3D resistivity diagram and its own apparent resistivity cross-plot at Jubilee Cave. Note that the sinkhole is located between where the high resistivity anomaly is defined with a spherical geometry.

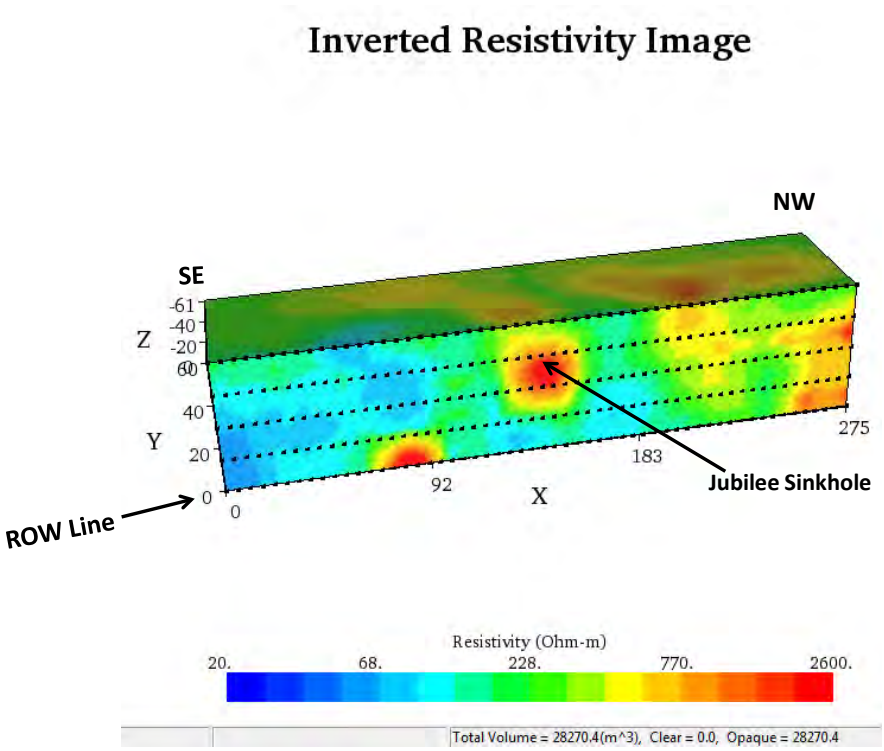


Figure 29. Another map-view of the 3D resistivity data at Jubilee Cave. The sinkhole is well-defined with a high resistivity anomaly.

Figure 30 displays the dynamical slices of 3D resistivity data from Jubilee Cave. The sinkhole is defined with a high resistivity anomaly and appears to extend down to 15 feet.

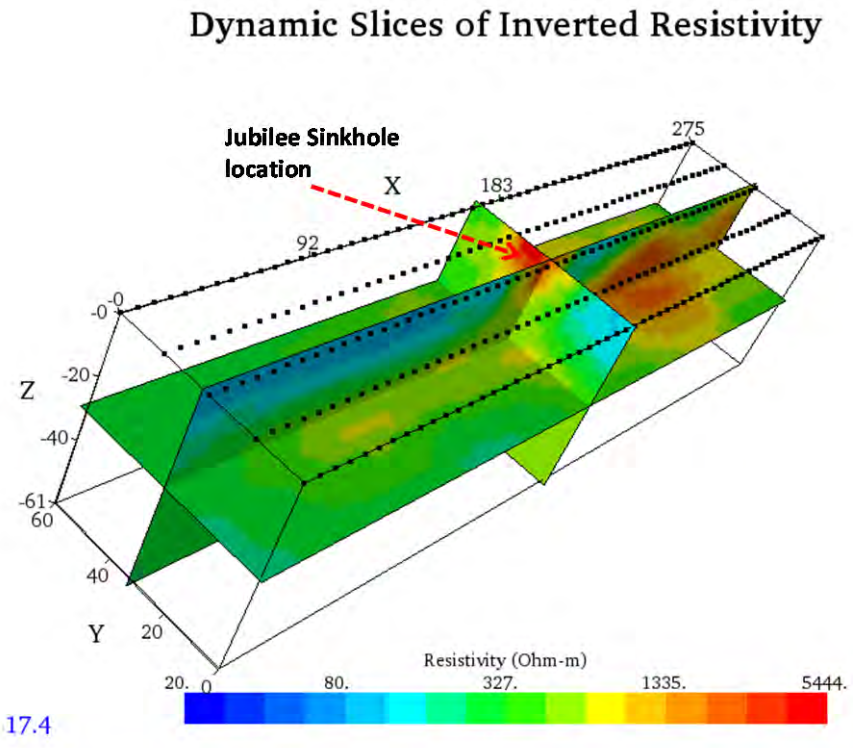


Figure 30. 3D dynamic slices of resistivity data at Jubilee Cave. The resistivity data indicates a significant anomaly in the vicinity of the sinkhole.

8.8. Interpretation of NP Data across Jubilee Cave (F110)

Figure 31 provides the natural potential map for the Jubilee Cave. The NP data was collected along the same 5 profiles of resistivity data. We made following observations on the NP map: 1) There is a positive NP anomaly which corresponds to the location of the sinkhole; 2). There is another apparent NP anomaly along Line 5 between station 200 and 230 feet. To explore this anomaly, we presented the NP data in a profile format in Figure 32, which indicates a significant anomaly, well-defined, between stations 190 and 230 feet. This anomaly is probably caused by a karst feature.

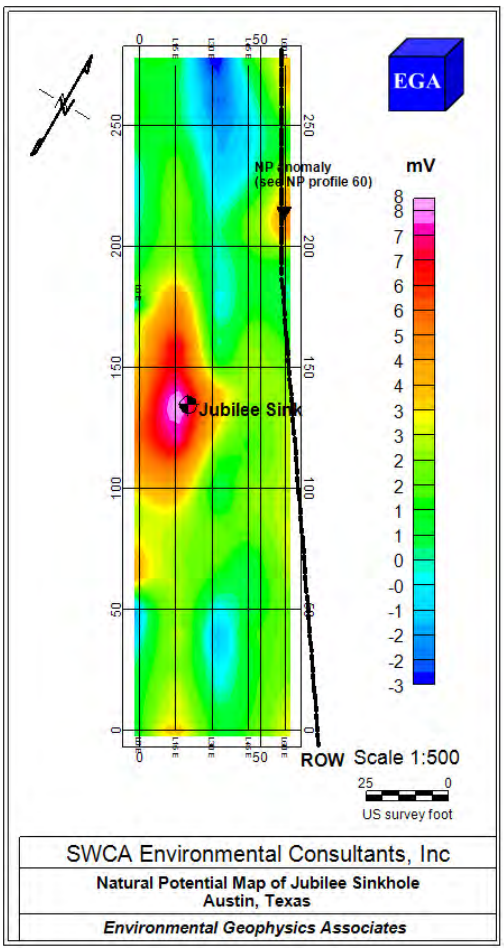


Figure 31. Natural Potential map of Jubilee Cave. The location of the sinkhole is shown with a circle filled with black and white next to the highest NP values across the site. There is another significant NP anomaly shown between stations 200 and 230 feet. The ROW profile merges with Line 5 at station 180 feet.

Figure 32 shows the NP data along line 5 in profile format indicating the high NP anomaly observed between stations 200 and 230 feet in Figure 31. The anomaly is probably caused by a karst feature.

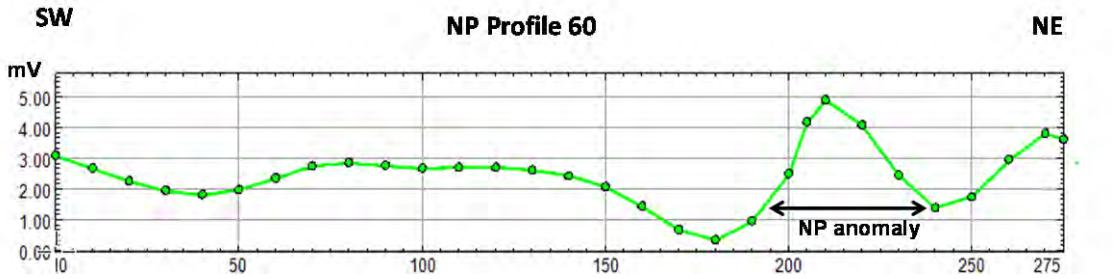


Figure 32. NP data along profile 75 feet. Note the presence of a significant positive NP anomaly between stations 190 and 230 feet

9.0 Discussion of Geophysical Data

2D resistivity data obtained across the four known or potential karstic features (Cow Pattie Cave, Hat Sink, F58a and Jubilee Cave) indicated significant resistivity anomalies. Cow Pattie and Hat Sinkholes indicated low resistivity anomalies across these features. Excavation of these features by SWCA revealed that they were filled with Terra Rossa soil, which explains the origin of the low resistivity values.

3D resistivity diagrams failed to delineate the Cow Pattie and Hat Sinkholes. However, the 3D data helped identify new karstic features in the vicinity of sinkholes.

2D and 3D resistivity data from F58a yielded significant high and low resistivity anomalies. Excavation at the location of F58a also indicated Terra Rossa type soil.

2D and 3D resistivity data from Jubilee Cave indicated high resistivity anomalies. Terra Rossa type soil was not present at this location.

The natural potential data collected across the four features provided positive NP anomalies, correlating well with the resistivity data. Furthermore, results of the 2D resistivity and NP study (LCRA report, 2007) over the Flint Ridge Cave also indicated high and low resistivity and high NP anomalies.

10.0 Interpretation of Natural Potential (NP) Data along SH 45 Right of Way

Our starting point (0 feet) for the NP data collection is from the southern end of the ROW profile, which is few hundred feet to the north of Highway 1626 (see Figure 1). We presented NP data on profiles. Each profile is about 1000 feet long unless otherwise indicated. We tied up first 3160 feet NP values to the base station located at zero (0) feet. Due to the intervening two county roads, the NP profiles between 3160 and 3740 feet were not tied up to any fixed NP base station. The rest of the NP values farther north, which are confined between stations 3820 and 18280 feet, was tied up to the base station at 5000 feet.

Sources of NP anomalies could be due to primarily karstic features. However, lateral change in lithologic variation, abrupt changes in topographic elevation also cause NP anomalies. We should note that the interpretation of NP anomalies is qualitative and we can not estimate depth of the anomalies.

10.1 NP Data between Stations 0-3160 Feet

The NP data collected between stations 0 and 3160 feet are presented in Figure 33. The first profile (A) extends from zero to 2000 feet, and the second one (B) extends from 2010 to 3160 feet.

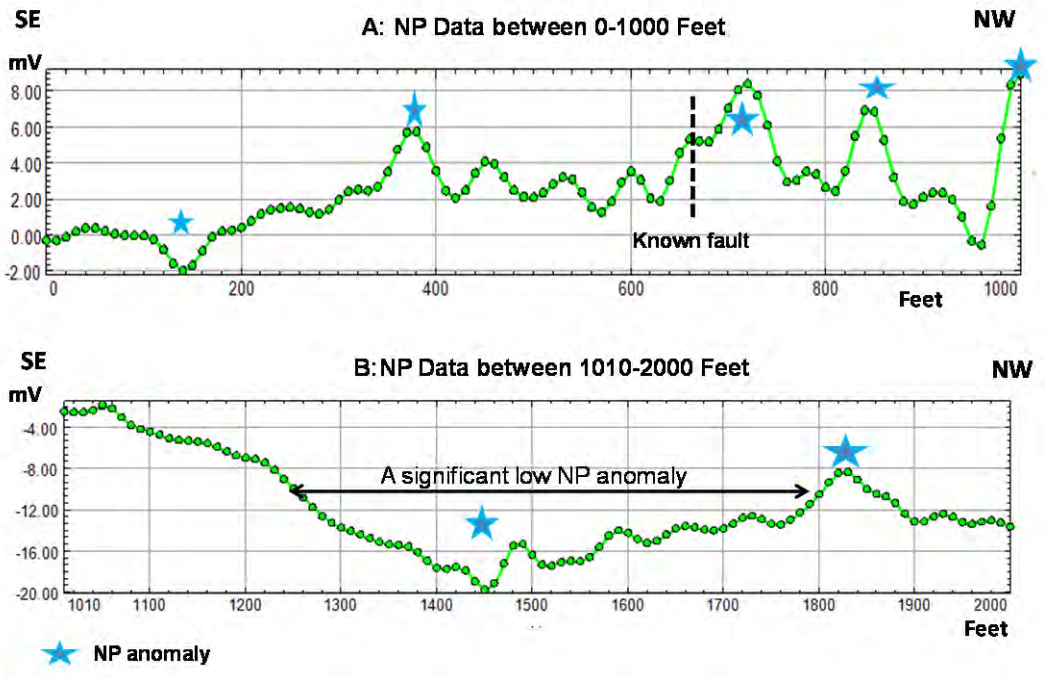


Figure 33. NP data along stations between 0 and 2000 Feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	70	
A	380	
A	725	Known fault
A	860	
A	1000	
B	1450	
B	1250-1800	Significant low NP
B	1830	

10.2 NP Data between Stations 2010 and 3740 Feet

The NP data collected between stations 2010 and 3740 feet are presented in Figure 34. The first profile (A) extends from 2010 to 3110 feet, and the second one (B) extends from 3140 to 3740 feet.

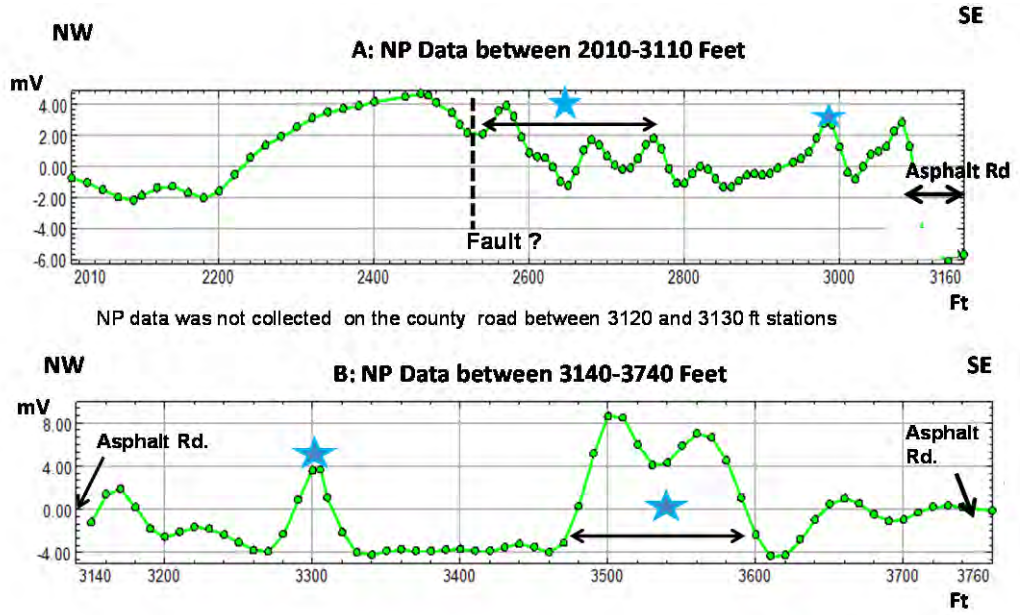


Figure 34. NP data between stations 2010 and 3740 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	2520	Fault location?
A	2540-2570	Multiple anomalies
A	2880	Known fault
B	3300	
B	3470-3600	

We should note that the NP values presented in profile B were not tied to the base station located at zero station because of intervening county roads. The NP data represents local values.

10.3 NP Data between Stations 3820 and 6000 Feet

The NP data collected between stations 3820 and 6000 feet are presented in Figure 35. The first profile (A) extends from 3820 to 5000 feet, and the second one (B) extends from 5010 to 6000 feet.

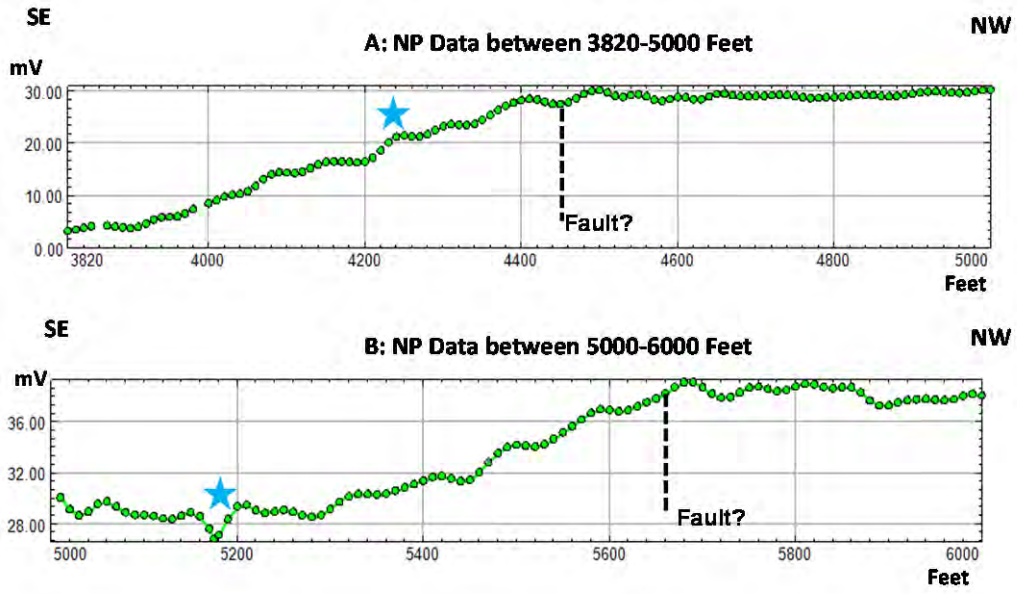


Figure 35. NP data between stations 3820 and 6000 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	4250	
A	4460	Fault anomaly
B	5170	
B	5660	Fault anomaly

*NP values from 3820 stations to the end of the SH 45 ROW (18,280 feet) are tied up to the base station at 5,000 feet. For this reason, the NP values should show consistency from one profile to another.

10.4 NP Data between Stations 6010 and 8000 Feet

The NP data collected between stations 6010 and 8000 feet are presented in Figure 36. The first profile (A) extends from 6010 to 7000 feet, and the second one (B) extends from 7010 to 8000 feet.

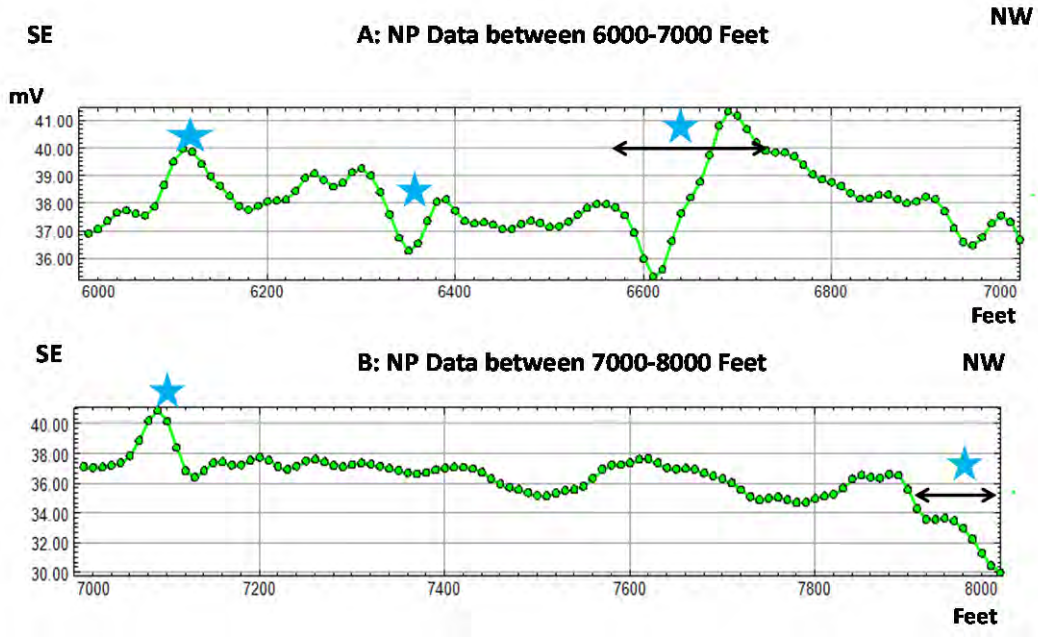


Figure 36. NP data between stations 6010 and 800 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	6110	
A	6350	
A	6540-6720	
B	7100	
B	7960-8000	

10.5 NP Data between Stations 8010 and 10000 Feet

The NP data collected between stations 8010 and 10000 feet are presented in Figure 37. The first profile (A) extends from 8010 to 9000 feet, and the second one (B) extends from 9010 to 10000 feet. Note that the second profile B crosses the Bear Creek.

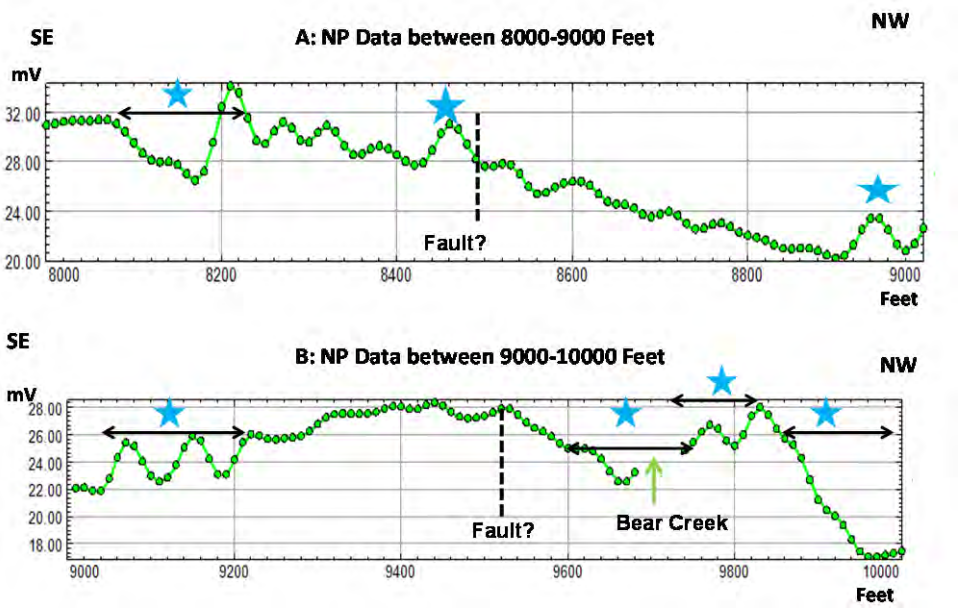


Figure 37. NP data between stations 8010 and 10000 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	8100-8200	
A	8460	
A	8510	Fault?
A	8940	
B	9060-9200	
B	9520	Fault?
B	9600-9740	Significant low NP*
B	9740-9840	
B	9900-10000	Significant low NP**

*This low anomaly corresponds to where the Bear Creek is located. It is probably caused by the infiltration of the water through the Creek bed.

**This anomaly corresponds to the steep topographic high on the northern edge of the Bear Creek.

10.6 NP Data between Stations 10010 and 12000 Feet

The NP data collected between stations 10010 and 12000 feet are presented in Figure 38. The first profile (A) extends from 10010 to 11000 feet, and the second one (B) extends from 11010 to 12000 feet.

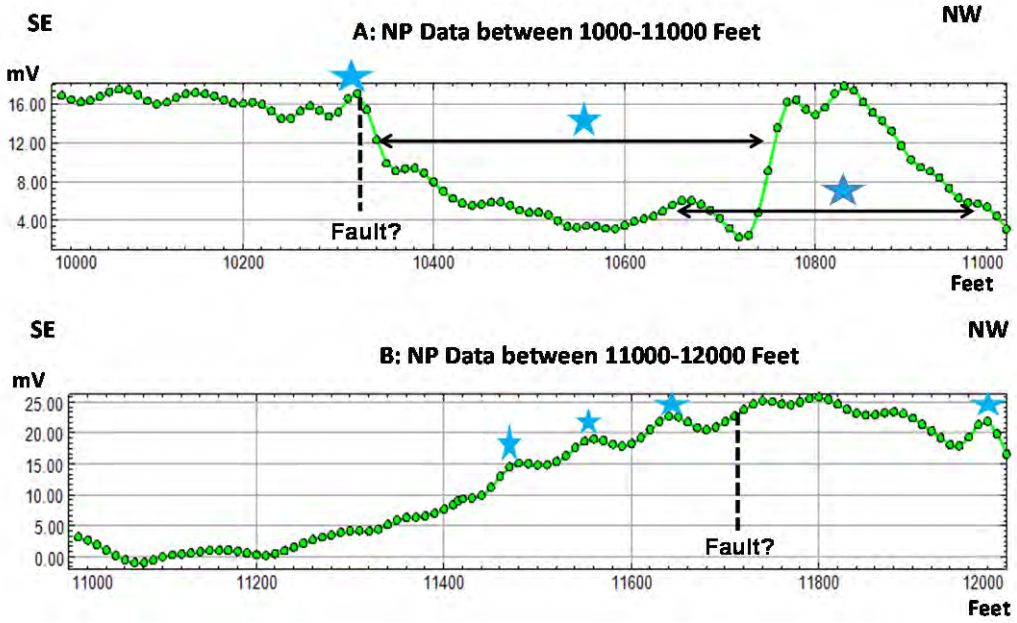


Figure 38. NP data between stations 10010 and 12000 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	10320	
A	10320	Fault?
A	10360-10740	Significant low NP
A	10740-11000	Significant high NP
B	11490	
B	11570	
B	11650	
B	11720	Fault?
B	11980	

10.7 NP Data between Stations 12010 and 14000 Feet

The NP data collected between stations 12010 and 13000 feet are presented in Figure 39. The first profile (A) extends from 12010 to 13000 feet, and the second one (B) extends from 13010 to 14000 feet.

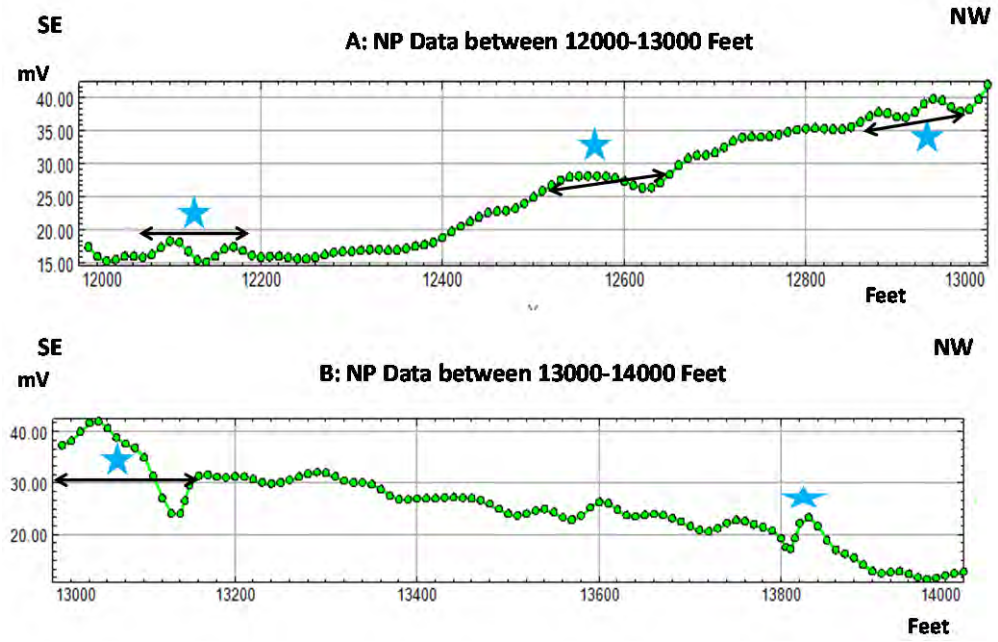


Figure 39. NP data between stations 12010 and 14000 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	12080-12200	
A	12540-12650	
A	12900-12980	
B	13000-13180	
B	13830	

*Both profiles A and B suggest a fault anomaly due their sinusoidal (S type) anomaly.

10.8 NP Data between Stations 14010 and 16000 Feet

The NP data collected between stations 14010 and 16000 feet are presented in Figure 40. The first profile (A) extends from 14010 to 15000 feet, and the second one (B) extends from 15010 to 16000 feet.

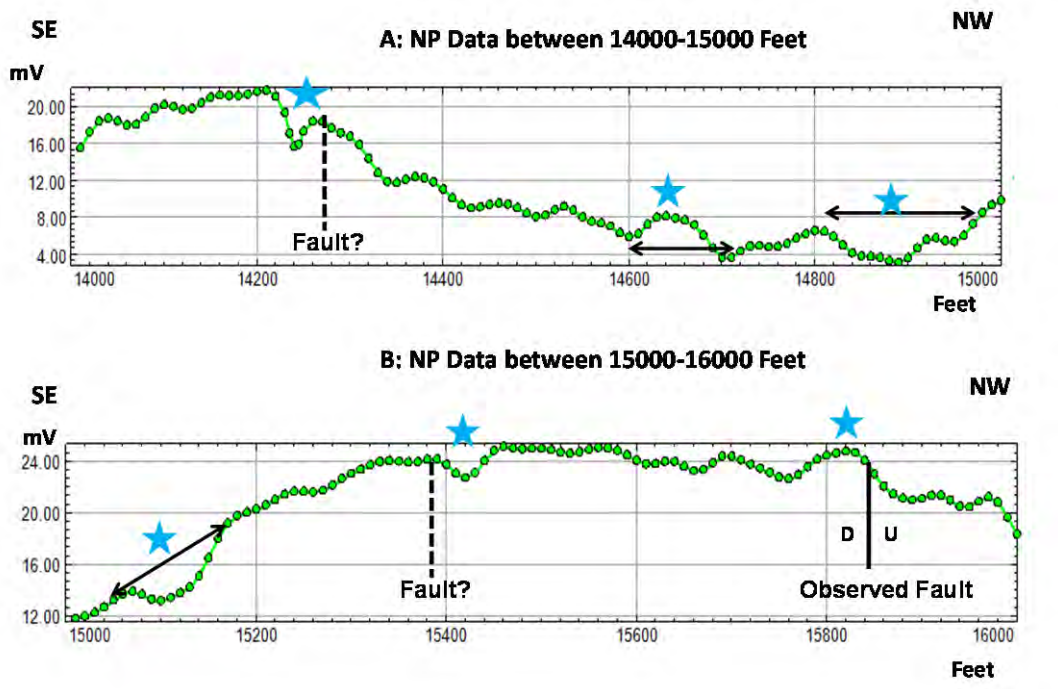


Figure 40. NP data between stations 14010 and 16000 Feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	14230	
A	14280	Fault?
A	14600-14700	
A	14820-14860	
B	15060-15170	
B	15430	
B	15840	Observed fault in the field

10.8 NP Data between Stations 16010 and 18280 Feet

The NP data collected between stations 16010 and 17000 feet are presented in Figure 41. The first profile (A) extends from 16010 to 17000 feet, and the second one (B) extends from 17010 to 18280 feet.

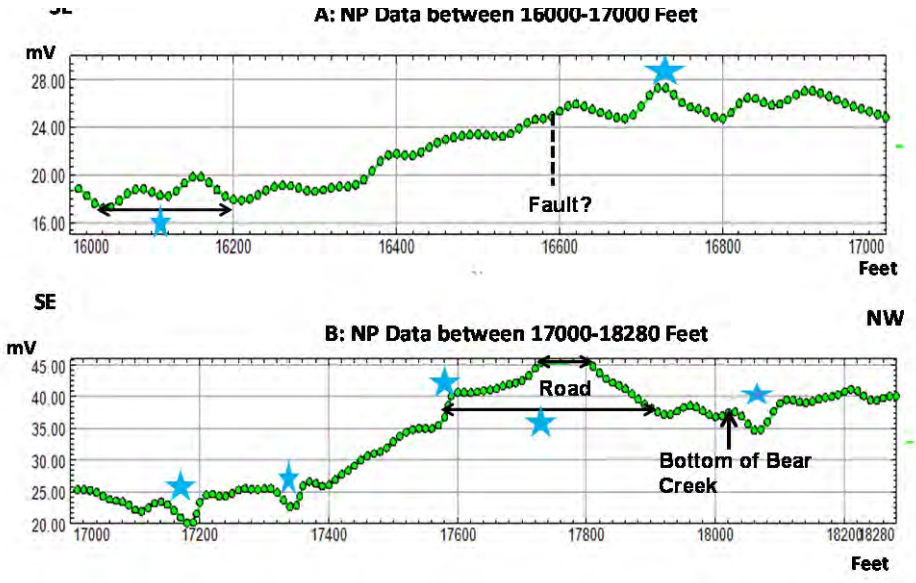


Figure 41. NP data between stations 16000 and 18280 feet.

Profiles A and B and indicate several NP anomalies, which are indicated as asterisk filled with blue color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	16080-16200	
A	16600	Fault?
A	16720	
B	17180	
B	17340	
B	17580	
B	17600-17880	Significant high NP**
B	18080	

*Both profiles suggest faults due to their "S" type geometry.
**It could be due to a fault (s) and/or karstic features.

11.0 Discussion of NP Data

The NP data collected along the SH 45 Right of Way (ROW) indicate several anomalies. Location (station distance) of these anomalies along the ROW is given below.

Profile ID	Coordinate (X-feet)	Remarks
0-1000	70	
0-1000	380	
0-1000	725	Known fault
0-1000	860	
0-1000	1000	
1010-2000	1450	
1010-2000	1250-1800	Significant low NP
1010-2000	1830	
2010-3110	2520	Fault location?
2010-3110	2540-2570	Multiple anomalies
2010-3110	2880	Known fault
3140-3760	3300	
3140-3760	3470-3600	
3820-5000	4250	
3820-5000	4460	Fault anomaly
5010-6000	5170	
5010-6000	5660	Fault anomaly
6010-7000	6110	
6010-7000	6350	
6010-7000	6540-6720	
7010-8000	7100	
7010-8000	7960-8000	
8010-9000	8100-8200	
8010-9000	8460	
8010-9000	8510	Fault?
8000-9000	8940	
9010-10000	9060-9200	
9000-10000	9520	Fault?
9000-10000	9600-9740	Significant low anomaly
9000-10000	9740-9840	
9000-10000	9900-10000	Significant low anomaly
10010-11000	10320	
10010-11000	10320	Fault?
10010-11000	10360-10740	Significant low anomaly
10010-11000	10740-11000	Significant high anomaly
11010-12000	11490	
11010-12000	11570	
11010-12000	11650	

Profile ID	Coordinate (X-feet)	Remarks
11010-12000	11720	Fault?
11010-12000	11980	
12010-13000	12080-12200	
12010-13000	12540-12650	
12010-13000	12900-12980	
13010-14000	13000-13180	
13010-14000	13830	
14010-15000	14230	
14010-15000	14280	Fault?
14010-15000	14600-14700	
14010-15000	14820-14860	
15010-16000	15060-15170	
15000-16000	15430	
15000-16000	15840	Observed fault in the field
16010-17000	16080-16200	
16010-17000	16600	Fault?
16010-17000	16720	
17010-18000	17180	
17010-18000	17340	
17010-18000	17580	
17010-18000	17600-17880	Significant high NP
17000-18000	18080	

Sources of these NP anomalies are probably due to karstic features, i.e., voids, caves, water flow in conduits, and the Balcones Faults. In fact, the NP data suggests as many as 10 faults along the HH45 ROW. Other sources causing NP anomalies could be topographic elevation changes, lithological changes, and soil variations.

12.0 Interpretation of Resistivity Data along SH 45 Right of Way

Our starting point (0 feet) for the data collection is from the southern end of the ROW profile, which is few hundred feet to the north of Highway 1626. We presented resistivity data on profiles. Each profile is about 1000 feet long (more or less).

Delineation of the anomalies is subjective, and it is based on our 14 years of experience working on the Edwards Aquifer. We used the resistivity color bar scale on each profile to determine the best representation of the resistivity data. For this reason, the color bar variation is not fixed, and varies along the entire ROW profile.

Resistivity for weathered limestone varies between 50 to 300 Ω-m, while fresh limestone is expected to produce a range of values between 350-10,000 Ω-m and more. Del Rio Clay, which is the impermeable unit that overlies the Edwards Aquifer, has a range of resistivity values of 1 to 20 Ω-m. The presence of moisture or groundwater reduces resistivity values. The presence of air-filled caves causes highest resistivity values. But it is rarely that caves are purely filled with air. A variety of sediments accumulates in caves and can be preserved more or less intact for

long periods of time (Palmer, 2007). Presence of sand and gravel and clay deposits, mineralization, faults and fractures, perched water in caves are the rules rather than the exception. Clay-filled caves cause low resistivity values.

We applied topographic corrections to all the resistivity profiles, from the beginning and to the end of the resistivity profile along the ROW. The depth of exploration in the resistivity sections is about 60 feet below the ground.

Sources of resistivity anomalies could be due to primarily karstic features in the study area. However, lateral change in lithologic variations, moisture content and porosity changes could also produce anomalies that are similar to karstic anomalies. We should note, again, that the interpretation of resistivity data is qualitative.

12.1 Resistivity Data between Stations 0 and 1880 feet

The resistivity data collected between 0 (zero) and 1880 feet is given in Figure 42a and b. The first profile (A) extends from zero to 1249 feet, and the second one (B) extends from 980 to 1880 feet. Note that the A and B profiles are overlapping each other significantly in order to provide a complete coverage of the anomalies.

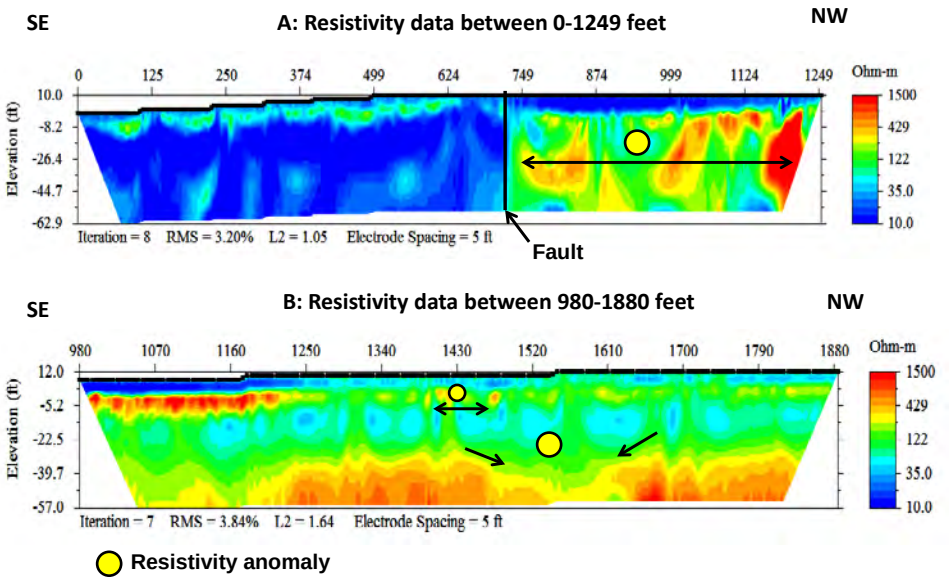


Figure 42. Resistivity data along stations between 0 and 1880 feet.

Profiles A and B of Figure 42 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	730	Fault?
A	749-1249	
B	1400-1460	
B	1400-1650	

It should be noted that the resistivity anomalies indicated between stations 749 and 1249 feet in Figure 42a is not repeated between the same stations in Figure 42b. The reason for that is not known.

12.2 Resistiviy Data between Stations 1610 and 3109 Feet

The resistivity data collected between 1610 and 3109 feet is given in Figure 43a and b. The first profile (A) extends from 1610 to 2600 feet, and the second one (B) extends from 2310 to 3109 feet.

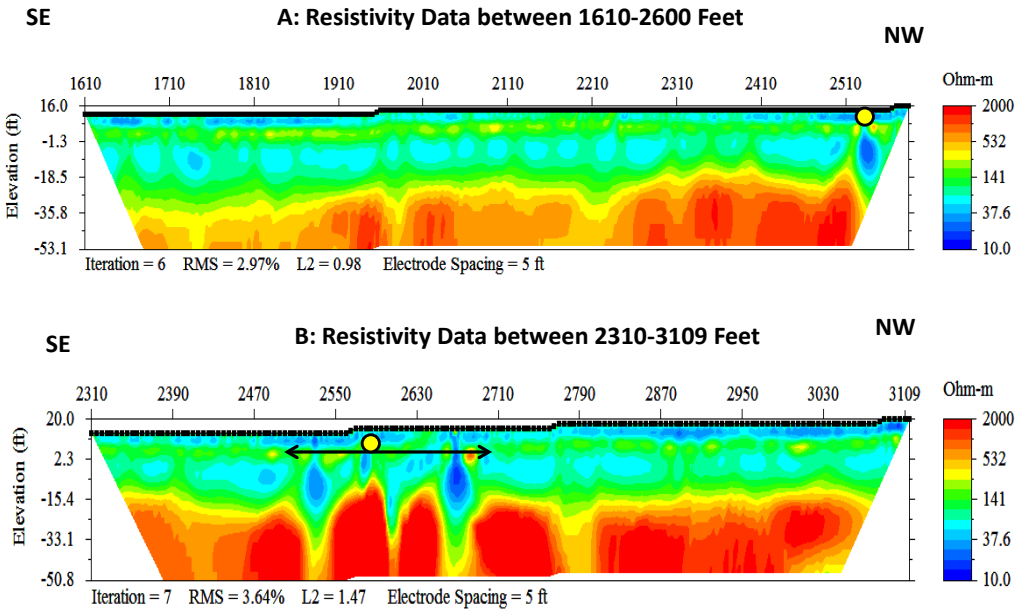


Figure 43. Resistivity data between stations 1610 and 3109 feet.

Profiles A and B Figure 43 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	2530	
B	2500-2700	

*Anomalies on these profiles are probably due to voids filled with clays and/or weathered, fragmented limestone which are called "soil pipes" in karst literature. This type of anomalies is very prevalent along the ROW.

12.3 Resistivity Data between Stations 3145 and 4750 Feet

The resistivity data collected between 3145 and 4600 feet is given in Figure 44a and b. The first profile (A) extends from 3145 to 3745 feet, and the second one (B) extends from 3795 to 4750 feet. These two resistivity sections do not overlap due to the county road between them.

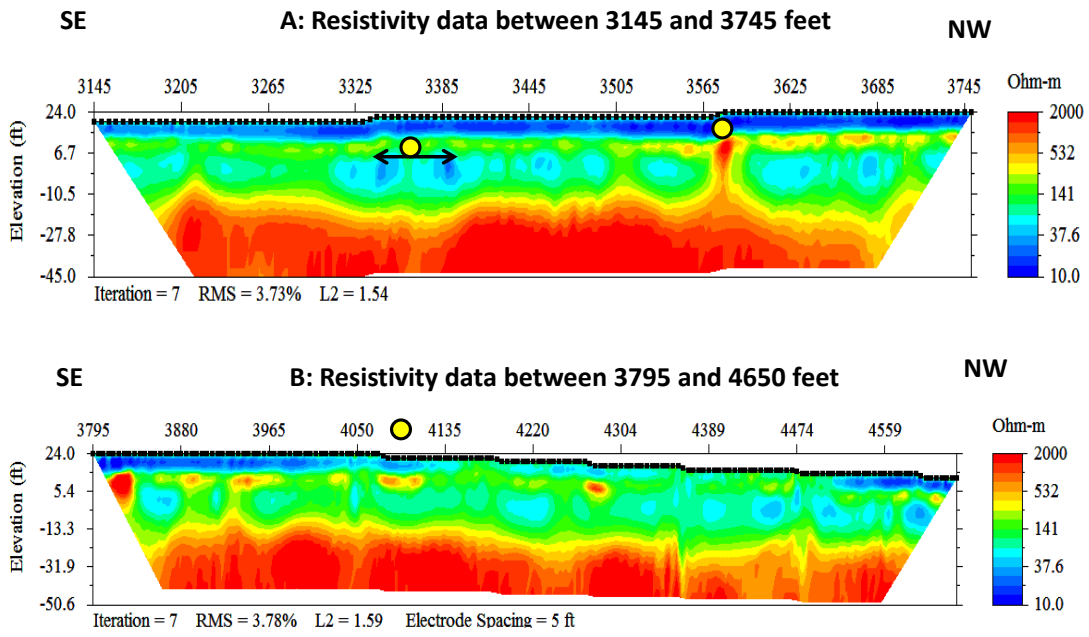


Figure 44. Resistivity data between stations 3145 and 4750 feet.

Profiles A and B of Figure 44 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	3340-3390	
A	3365-3580	
B	4100-4120	

12.4 Resistivity Data between Sations 4355 and 6030 Feet

The resistivity data collected between 4355 and 6030 feet is given in Figure 45a and b. The first profile (A) extends from 4355 to 5330 feet, and the second one (B) extends from 5055 to 6030 feet.

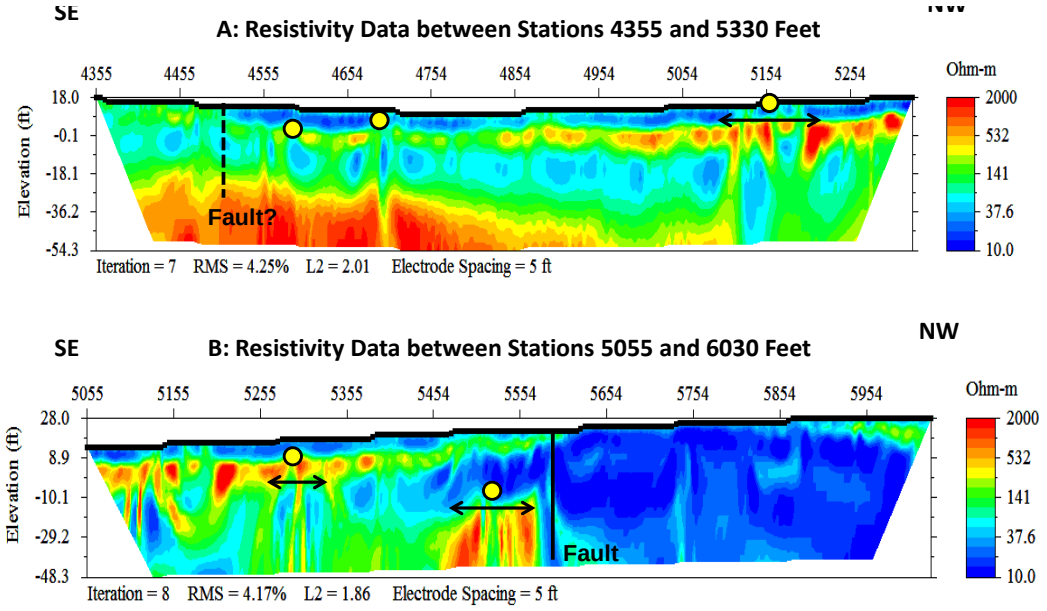


Figure 45**.** Resistivivity data between stations 4355 and 6030 feet**.**

Profiles A and B of Figure 45 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	4500	Fault?
A	4600	
A	5100-5200	
B	5260-5300	
B	5470-5560	
B	5600	Fault?

12.5 Resistivity Data between Stations 5755 and 7430 Feet

The resistivity data collected between 5755 and 7430 feet is given in Figure 46a and b. The first profile (A) extends from 5755 feet to 6740 feet, and the second one (B) extends from 6455 to 7430 feet.

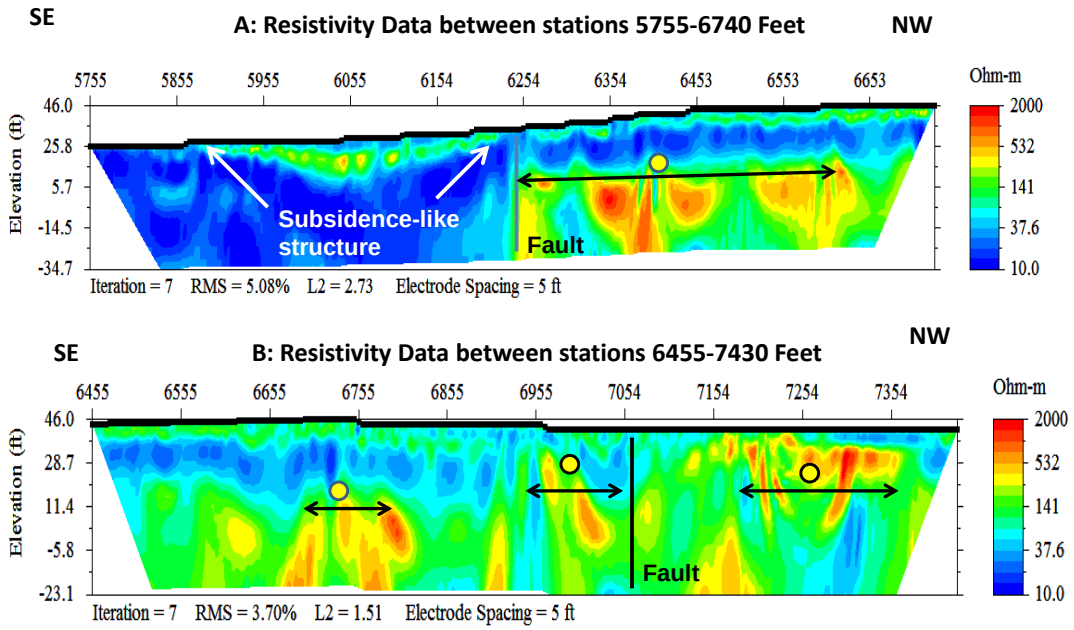


Figure 46**.** Resistivivity data between stations 5755 and 7430 feet**.**

Profiles A and B Figure 46 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	5875-6240	Subsidence
A	6250	Fault?
A	6250-6600	
B	6700-6800	
B	6955-7025	
B	7060	Fault?
B	7170-7350	

12.6 Resistivity Data between Stations 7155 and 8840 Feet

The resistivity data collected between 7155 and 88400 feet is given in Figure 47a and b. The first profile (A) extends from 7155 feet to 81300 feet, and the second one (B) extends from 7855 to 8830 feet.

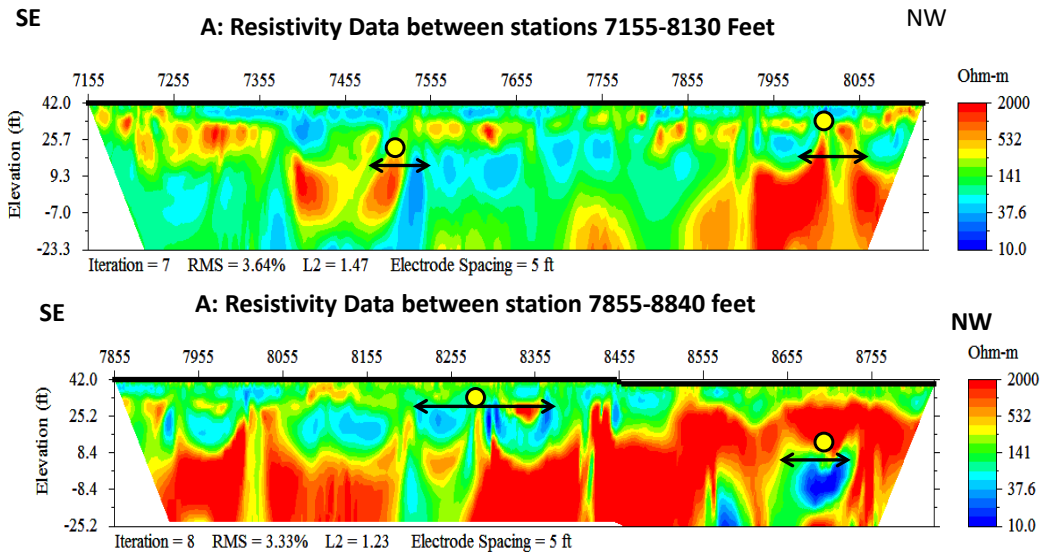


Figure 47. Resistivity data between stations 7155 and 8830 feet.

Profiles A and B of Figure 47 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	7470-7540	
A	8010-8040	
B	8230-8365	
B	8665-8740	

12.7 Resistivity data between Stations 8555 and 10230 Feet

The resistivity data collected between 8555 and 10230 feet is given in Figure 48a and b. The first profile (A) extends from 8555 feet to 9530 feet, and the second one (B) extends from 9255 to 10230 feet. It should be noted that we recalibarated the color bar resistivity scale from the lowest of 10 to 20 Ohm.m; and from the highest of 2000 to 5000 Ohm.m

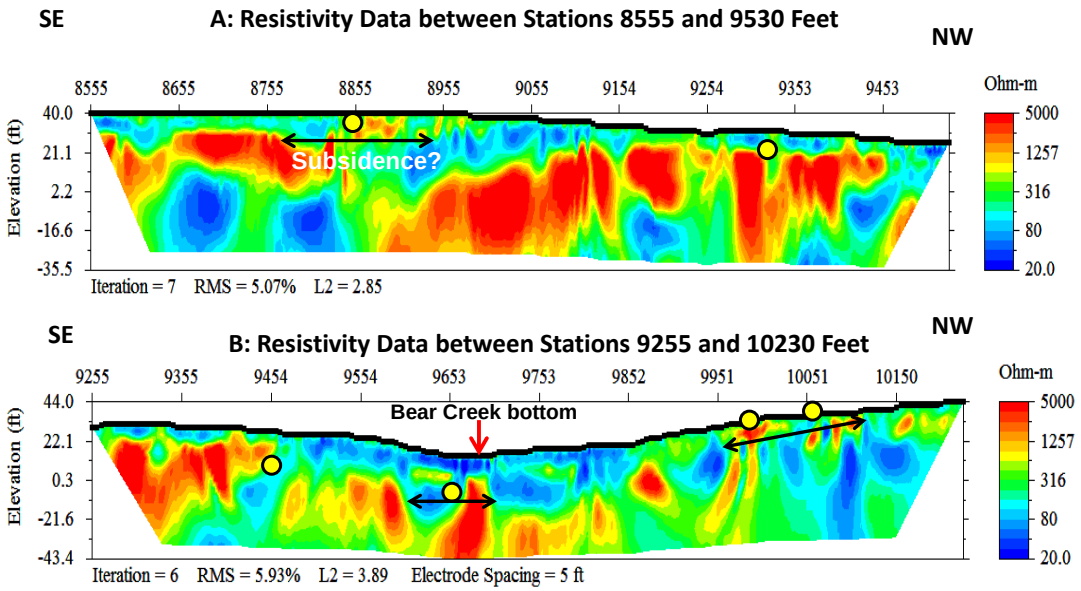


Figure 48. Resistivity data between stations 8555 and 10230 feet.

Profiles A and B of Figure 48 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	8760-8940	Subsidence?
A	9325	
B	9445	
B	9620-9720	9705 ft; middle of Creek
B	9950-10100	

12.8 Resistivity Data on Bear Creek Bed

We conducted a resistivity survey along the Bear Creek. The survey directionwas in the east-west direction and crossed the SH 45 ROW profile. The creek bed contained local areas of high elevation due to the apparent "upswelling" of the creek bed. The purpose of the survey was to decipher the apparent dome structures that were visible on the Creek bed. Figure 49 provides the resistivity data.

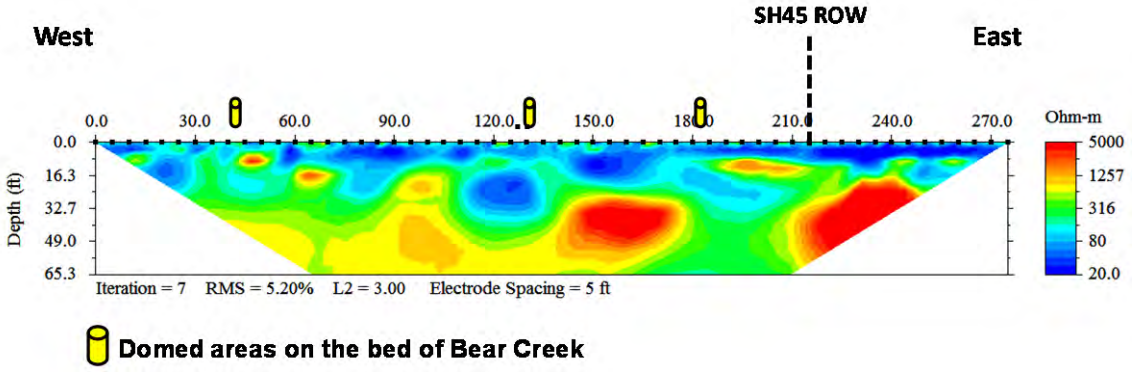


Figure 49. Resistivity profile on the beds of Bear Creek showing the data with the locations of domed areas and SH 45 ROW profile. There is no observable relation (pattern) between the "domed" areas and the distribution of the rocks with different resistivity values.

We did not observe any correlation between the location of the domed areas and the underlying distribution of the rocks.

12.9 Resistivity Data between Stations 9955 and 11560 Feet

The resistivity data collected between 9955 and 11560 feet is given in Figure 50a and b. The first profile (A) extends from 9955 feet to 10930 feet, and the second one (B) extends from 10655 to 11560 feet.

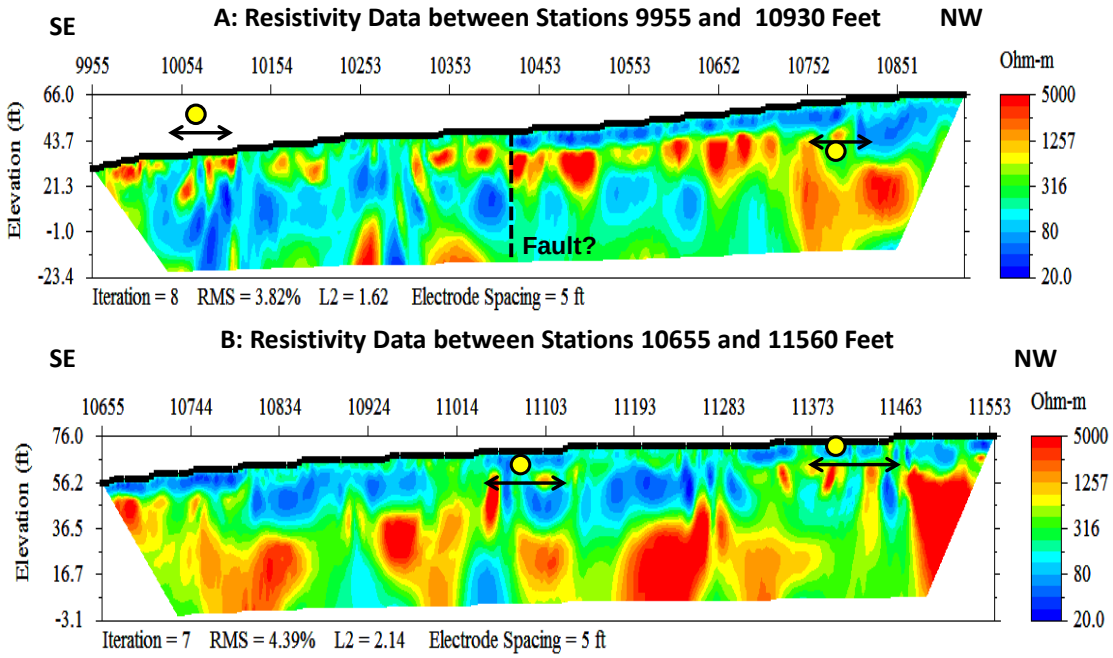


Figure 50. Resistivity data between stations 9955 and 11560 feet.

Profiles A and B of Figure 50 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	10030-10110	
A	10755-10815	
A	10410	Fault?
B	11050-11110	
B	11370-11460	

12.10 Resistivity Data between Stations 11285 and 12970 Feet

The resistivity data collected between 11285 and 12970 feet is given in Figure 51a and b. The first profile (A) extends from 11285 feet to 12260 feet, and the second one (B) extends from 11985 to 12970 feet.

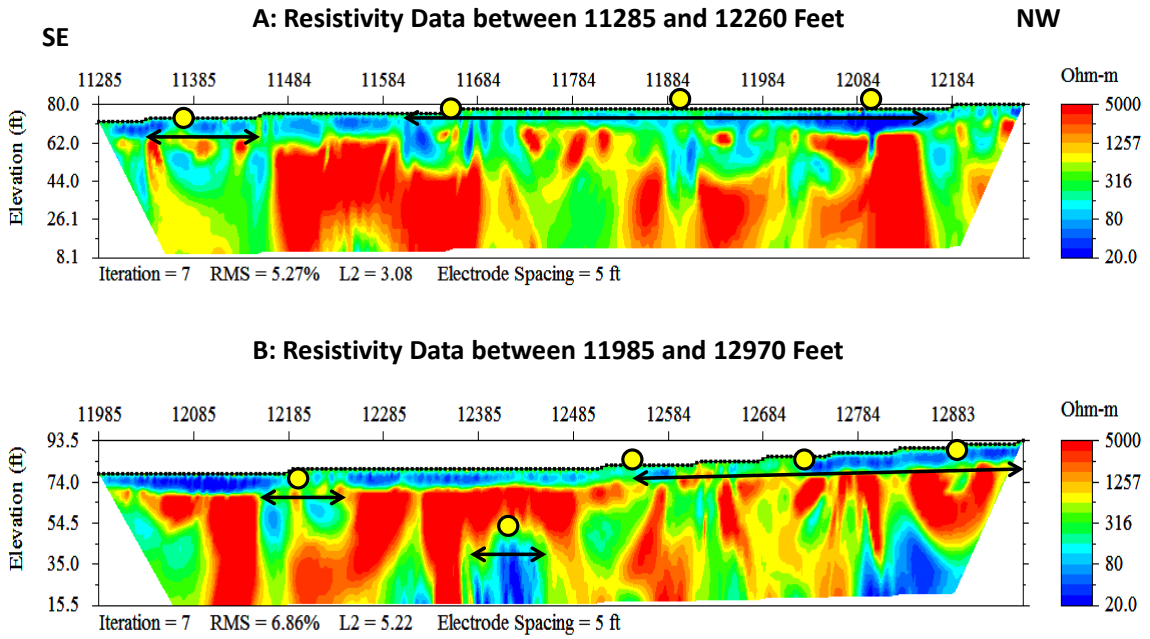


Figure 51. Resistivity data between stations 11285 and 12970 Feet.

Profiles A and B of Figure 50 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	11350-11450	
A	111600-12160	
B	12140-12250	
B	12270-12460	
B	12560-12910	

*It appears that the distribution of high resistive rocks (red in color) along resistivity profiles of Figure 51 gives the impression of being much more broken up than the rest of the profiles we have interpreted so far.

12.11 Resistivity Data between Stations 12685 and 14370 Feet

The resistivity data collected between 12685 and 14370 feet is given in Figure 52a and b. The first profile (A) extends from 12685 feet to 13655 feet, and the second one (B) extends from 13385 to 14370 feet.

It should be noted that the low resistivity valuee on the color-bar scales are not the same on the resistivity profiles. Figure 52a shows a 20 Ohm.m value whereas Figure 52b displays a 66 Ohm.m value. This observation shows that the resistivity profile B is free of clay whereas the resistivity profile A do contain low resistivity values attrituable to clay layers.

It should also be noted that the resistivity data along profile B had much more noise than the previous profiles observed so far. The noisy data appears to be located between stations 13485 and 13550 feet; and stations 14050 and 14110 feet. Measured noisy resistivity data between these stations were eliminated as deep as eight feet below the surface using a special filter. The noise source could be due to the high resistance contact values because there are limestone outcrops either on the surface and/or very near the surface.

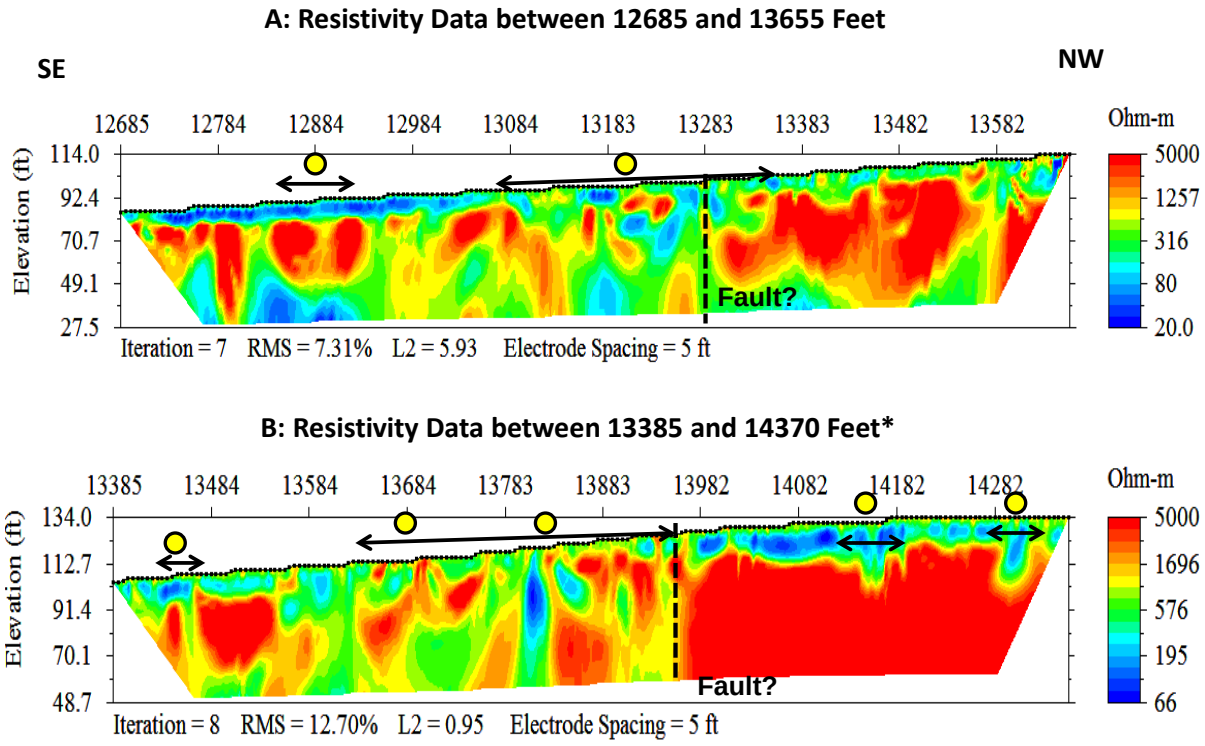


Figure 52. Resistivity data between stations 12685 and 14370 feet.

Profiles A and B of Figure 52 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	12840-12915	
A	13070-13200	
A	13280	Fault?
B	13430-13475	
B	13600-13950	
B	13950	Fault?
B	14115-14190	
B	14275-14320	

12.12 Resistivity Data between Stations 14084 and 15770 Feet

The resistivity data collected between 14084 and 15770 feet is given in Figure 53a and b. The first profile (A) extends from 14484 feet to 15060 feet, and the second one (B) extends from 14785 to 15770 feet.

It should be noted that the low resistivity valuee on the color-bar scales is the same as the previous profiles (Figure 52a and b). But we readjusted the upper scale of the resistivity data to 10,000 Oh.m from 5,000 Ohm.m on this data set. This readjustment better defines the resistivity distribution of the profiles and the anomalies.

It should also be noted that monolithic limestone bodies are present 30 feet or so below the surface. This competent limestone is observable to the north of the fault that was determined at about 13950 feet. To the south of this station, or fault, rocks are observed to be highly fractured, and broken down.

As the previous resistivity profiles of Figure 52, resistivity profiles have a low resistivity layer, which is identified with a resistivity value of 60 Oh.m. This low resistivity soil could be partly the weathered, eroded, fragmented parts of the native limestone layers, and contains some amounts of clay. We have observed this soil during the excavations of some of the features performed by SWCA personnel.

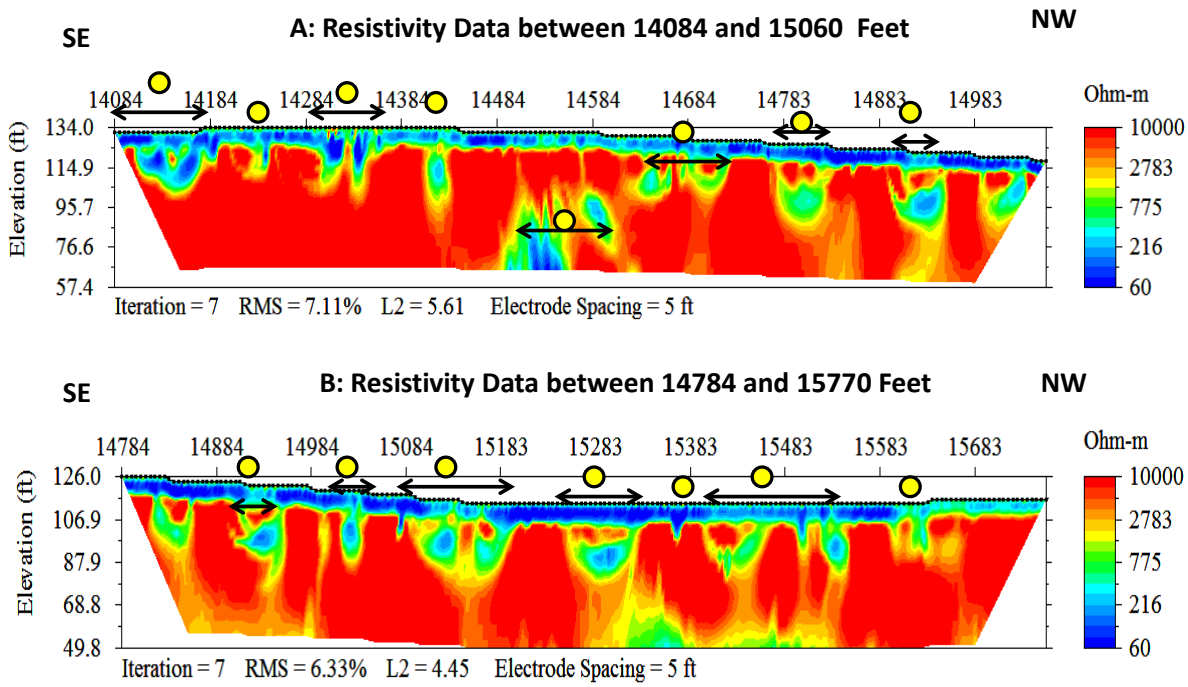


Figure 53. Resistivity data between stations 14084 and 15770 feet

Profiles A and B of Figure 52 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	14084-14185	
A	14240	
A	14290-14365	
A	14410	
A	14490-14585	
A	14640-14715	
A	14745-14820	
A	14880-14945	
B	14900-14950	
B	15000-15035	
B	15070-15185	
B	15245-15325	
B	15370	
B	15400-15575	
B	15625	

12.13 Resistivity Data between Stations 15485 and 16530 Feet

The resistivity data collected between 15485 and 16530 feet is given in Figure 54a and b. The first profile (A) extends from 15485 feet to 15900 feet, and the second one (B) extends from 15625 to 16530 feet. Lower and upper scales of the resistivity color bar are fixed with 60 and 10,000 Ohm.m, which attribute to highy weathered, fragmented limestone and clay units, and competent limestone rocks, respectively.

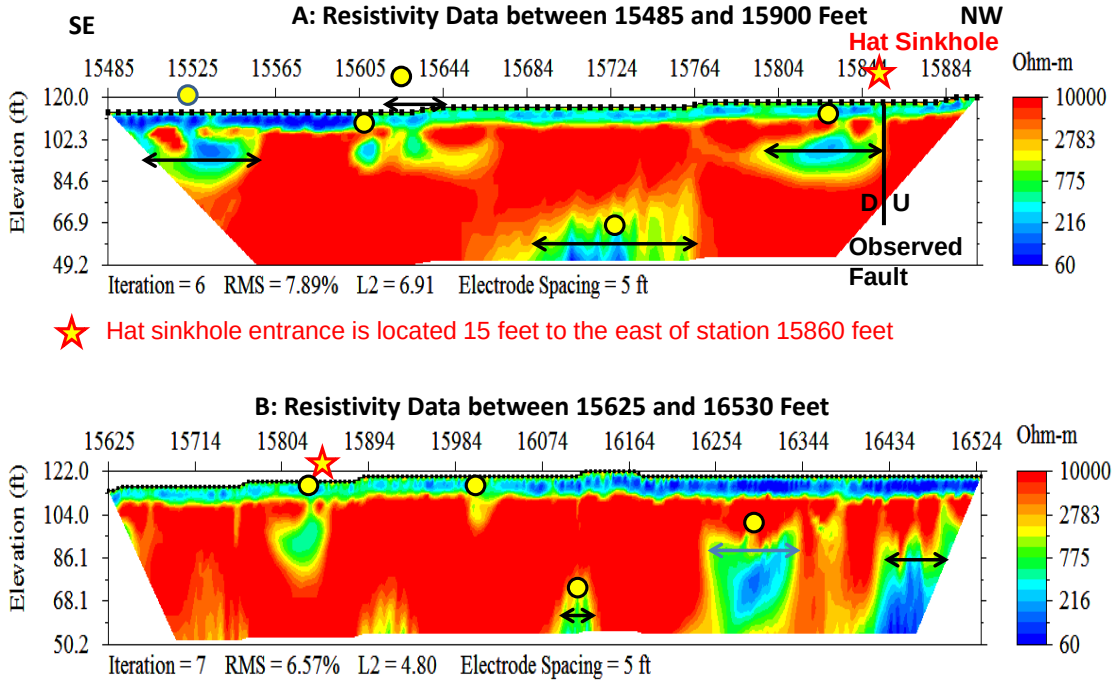


Figure 54. Resistivity data between 15485 and 16530 feet. Note that both profiles cross near the vicinity of Hat Sinkhole, which is about 20 feet to the east of profiles.

Profiles A and B of Figure 54 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks
A	15500-15555	
A	15610	
A	15615-15635	
A	15690-15760	
A	15790-15855	
A	15855	Observed fault
B	16005	
B	16110	
B	16245-16345	
B	16430-16500	

12.14 Resistivity Data between Stations 16255 and 17930 Feet

The resistivity data collected between 16255 and 17930 feet is given in Figure 55a and b. The first profile (A) extends from 16255 feet to 17230 feet, and the second one (B) extends from 16955 to 17930 feet. Lower part of the scale of the resistivity color bar is readjusted from 60 to 20 Ohm.m because these resistivity sections appear to be more clayey than the preceding resistivity profiles.

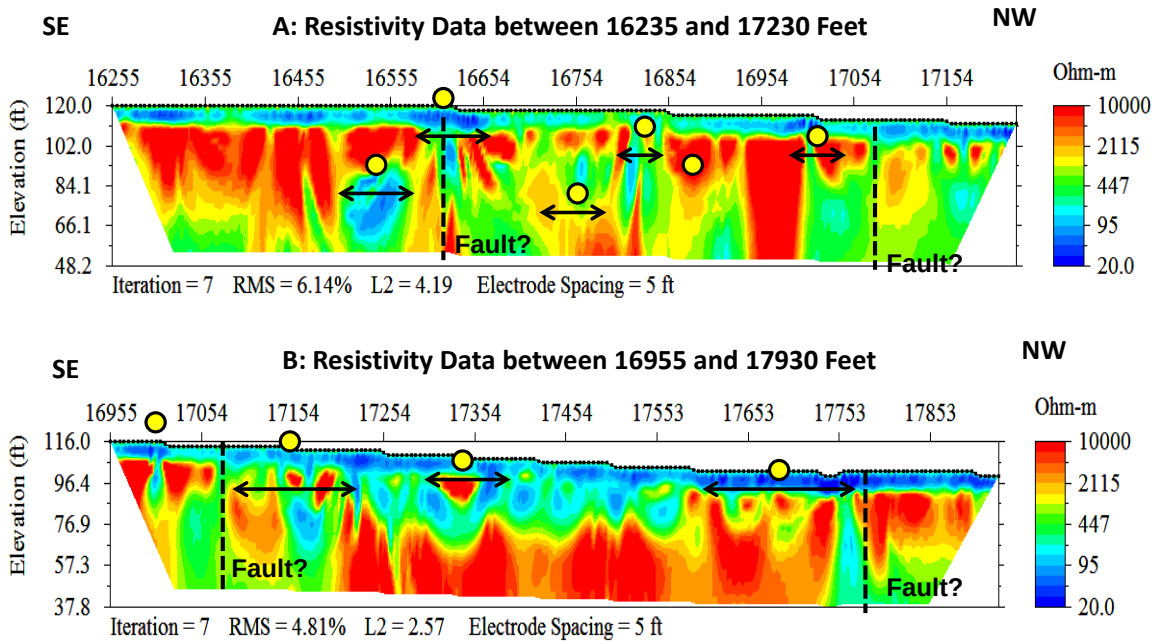


Figure 55. Resistivity data between stations 16255 and 17930 feet. Note that rocks appear to be highly fragmented, broken down between the proposed fault locations, which are dictated by the resistivity data.

Profiles A and B of Figure 55 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	16500-16575	
A	16600-16650	
A	16620	Fault?
A	16715-16790	
A	16895	
A	17000-17060	
B	17010	
B	17080	Fault?
B	17080-17250	
B	17300-17380	
B	17610-17800	
B	17800	Fault?

*It is significant to note that these resistivity profiles suggest three closely-spaced faults.

12.15 Resistivity Data between Stations 17655 and 18285 Feet

The resistivity data collected between 17655 and 18285 feet is given in Figure 56a and b. This resistivity section is the last one and terminates at station 18285 feet. It should be noted that the original termianationof the ROW was at about 18335 feet; however, the last roll-along for this profile was extremely noisy. For this reason we excluded the last roll-along data for the benefit of the remaning data set. The color bar scale was the same as the previous resistivity section (Figure 55).

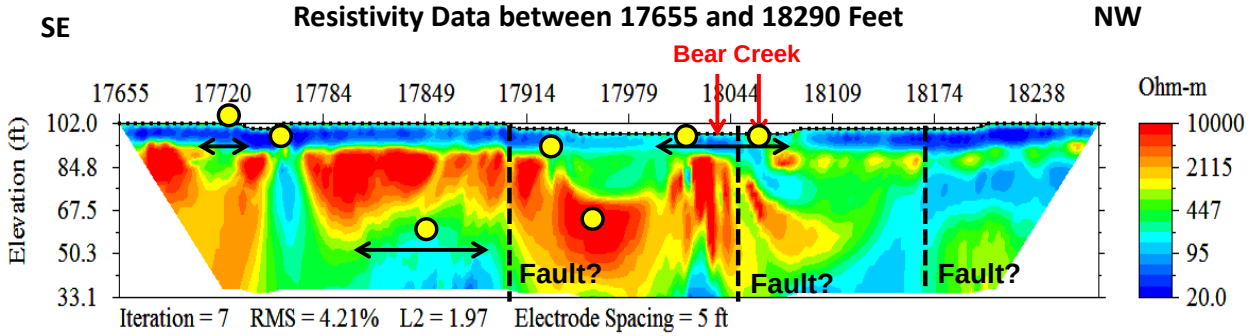


Figure 56. Resistivity data between stations 17655 and 18235 feet. Note that the profile crosses Bear Creek between stations 18035 and 18070 feet.

Profiles A and B of Figure 56 indicate several resistivity karst anomalies, which are indicated as circles filled with yellow color. Coordinate of these anomalies are shown below:

Profile ID	Coordinate (X-feet)	Remarks*
A	17700-17740	
A	17760	
A	17800	
A	17905	Fault?
A	18000-18085	
A	18050	Fault?
A	18170	Fault?

*It is significant to note that these resistivity profiles suggest three closely-spaced faults.

12.16. Summary of Resistivity Data

The resistivity data collected along the SH 45 Right of Way (ROW) indicate several karstic resistivity anomalies. Location (station distance) of these anomalies along the ROW is given below.

Profile ID	Coordinate (X-feet)	Remarks
0-1880-Ft		
A	730	Fault?
A	749-1249	
B	1400-1460	
B	1400-1650	

Profile ID	Coordinate (X-feet)	Remarks*
1610-1309-Ft		
A	2530	
B	2500-2700	

*Anomalies on these profiles are probably due to voids filled with clays and/or weathered, fragmented limestone which are called “soil pipes” in karst literature. This type of anomalies is very prevalent along the ROW.

Profile ID	Coordinate (X-feet)	Remarks
3145-4750-Ft		
A	3340-3390	
A	3365-3580	
B		

Profile ID	Coordinate (X-feet)	Remarks
4355-6030-Ft		
A	4500	Fault?
A	4600	
A	5100-5200	
B	5260-5300	
B	5470-5560	
B	5600	Fault?

Profile ID	Coordinate (X-feet)	Remarks
5755-7430-Ft		
A	5875-6240	Subsidence
A	6250	Fault?
A	6250-6600	
B	6700-6800	
B	6955-7025	
B	7060	Fault?
B	7170-7350	

Profile ID	Coordinate (X-feet)	Remarks
7155-8830-Ft		
A	7470-7540	
A	8010-8040	
B	8230-8365	
B	8665-8740	

Profile ID	Coordinate (X-feet)	Remarks
8555-10230-Ft		
A	8760-8940	Subsidence?
A	9325	
B	9445	
B	9620-9720	9705 ft; middle of Creek
B	9950-10100	

Profile ID	Coordinate (X-feet)	Remarks
9955-11560-Ft		
A	10030-10110	
A	10755-10815	
A	10410	Fault?
B	11050-11110	
B	11370-11460	

Profile ID	Coordinate (X-feet)	Remarks*
11285-12970-Ft		
A	11350-11450	
A	111600-12160	
B	12140-12250	
B	12270-12460	
B	12560-12910	

*It appears that the distribution of high resistive rocks (red in color) along resistivity profiles of Figure 51 gives the impression of being much more broken up than the rest of the profiles we have interpreted so far.

Profile ID	Coordinate (X-feet)	Remarks
12685-14370-Ft		
A	12840-12915	
A	13070-13200	
A	13280	Fault?
B	13430-13475	
B	13600-13950	
B	13950	Fault?
B	14115-14190	
B	14275-14320	

Profile ID	Coordinate (X-feet)	Remarks
14084-15770-Ft		
A	14084-14185	
A	14240	
A	14290-14365	
A	14410	
A	14490-14585	

A	14640-14715	
A	14745-14820	
A	14880-14945	
B	14900-14950	
B	15000-15035	
B	15070-15185	
B	15245-15325	
B	15370	
B	15400-15575	
B	15625	

Profile ID	Coordinate (X-feet)	Remarks
15485-16530-Ft		
A	15500-15555	
A	15610	
A	15615-15635	
A	15690-15760	
A	15790-15855	
A	15855	Observed fault
B	16005	

Profile ID	Coordinate (X-feet)	Remarks*
16255-17930-Ft		
A	16500-16575	
A	16600-16650	
A	16620	Fault?
A	16715-16790	
A	16895	
A	17000-17060	
B	17010	
B	17080	Fault?
B	17080-17250	
B	17300-17380	
B	17610-17800	
B	17800	Fault?

*****It is significant to note that these resistivity profiles suggest three closely-spaced faults.

Profile ID	Coordinate (X-feet)	Remarks*
17655-18285-Ft		
A	17700-17740	
A	17760	
A	17800	
A	17905	Fault?
A	18000-18085	
A	18050	Fault?

A	18170	Fault?

*****It is significant to note that these resistivity profiles suggest three closely-spaced faults.

13.0 Correlation of Resistivity and NP Data along SH 45 Right of Way

We correlated the resistivity and NP anomalies along the resistivity sections. We simply transferred the locations of the NP anomalies determined in Section 11 onto the resistivity data profiles displayed in Section 12.

13.1 Resistivity and NP anomalies between Stations 0 and 1880 feet

The correlation of resistivity and NP data collected between 0 (zero) and 1880 feet is given in Figure 57. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color. A fault location for NP anomaly is shown combination of the star symbol and the letter F.

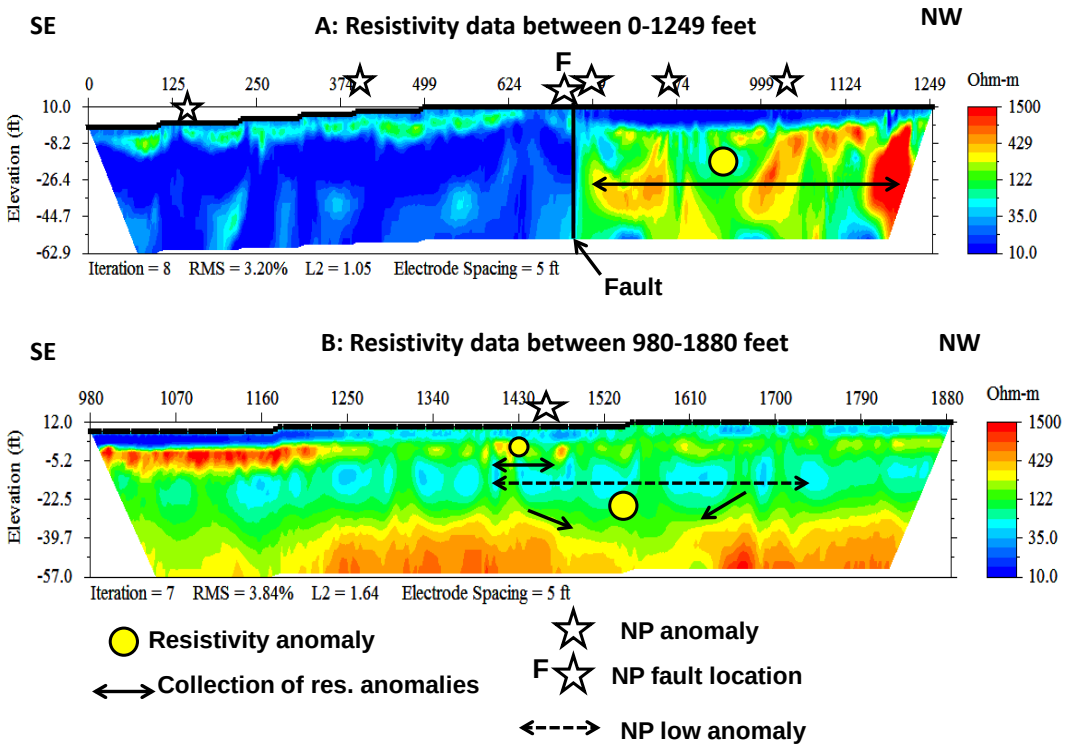


Figure 57. Correlation of resistivity and NP data along stations between 0 and 1880 feet.

NP anomalies determined at stations 140 and 380 feet do not correspond to any significant resistivity anomalies. However, it is possible that there may be karstic features at these locations within the resistivity unit (limestone shown with green color). The rest of the NP and resistivity anomalies correlate well. Especially, a low NP anomaly, which has a large width, corresponds well to a low resistivity anomaly between stations 1400 and 1650 feet.

13.2 Correlation of resistivity and NP Data between Stations 1610 and 3109 Feet

Correlation of resistivity and NP data collected between 1610 and 3109 feet is provided in Figure 58. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color. A fault location for NP anomaly is shown combination of the star symbol and the letter F.

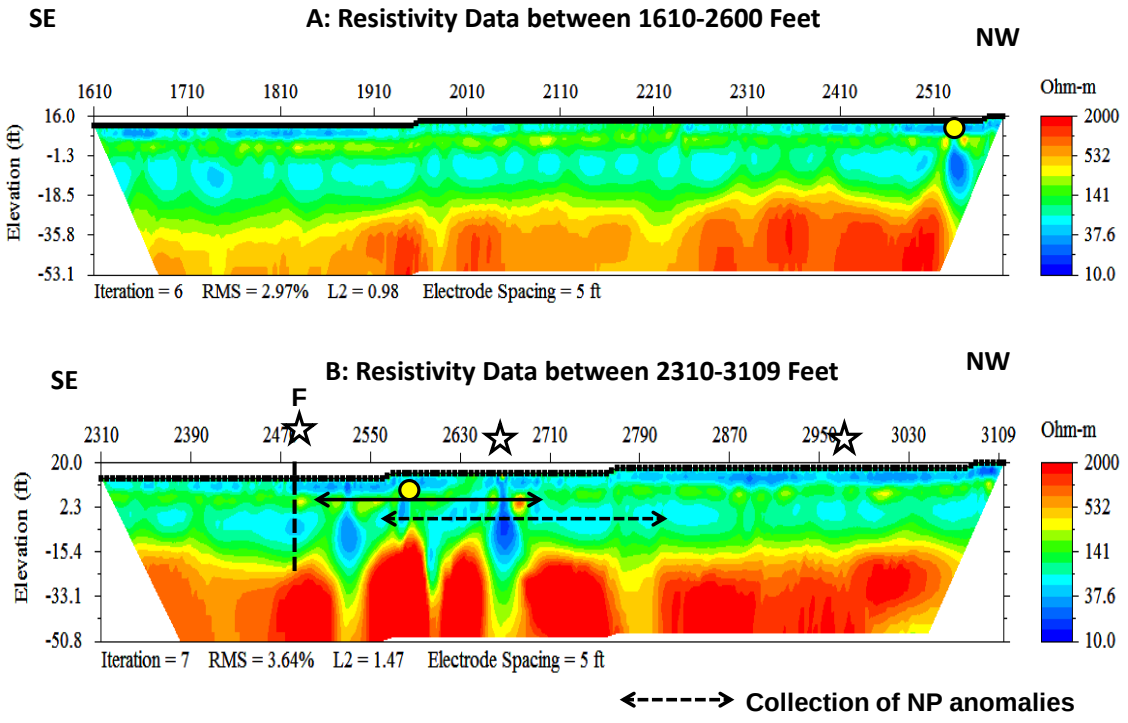


Figure 58. Resistivity data between stations 1610 and 3109 feet.

NP anomalies are superimposed on the resistivity sections in Figure 57. A fault location suggested by the NP data at station 2480 feet does not correlate with the resistivity data. However, the resistivity data displays significant karstic anomalies immediately to the northwest of this "fault" location. These anomalies consist of inter-fingering low resistivity limestone into the medium and high resistivity limestone rock. This type of geometry in the karstic literature is described with a term of "soil piping," which are voids filled with clays and/or weathered fragmented limestone.

Correlation of NP and resistivity anomalies is well except an NP anomaly at station 2970 feet does not corresponds to any resistivity anomaly.

13.3 Resistivity Data between Stations 3145 and 4750 Feet

Correlation of resistivity and NP data collected between 3145 and 4750 feet is provided in Figure 59. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

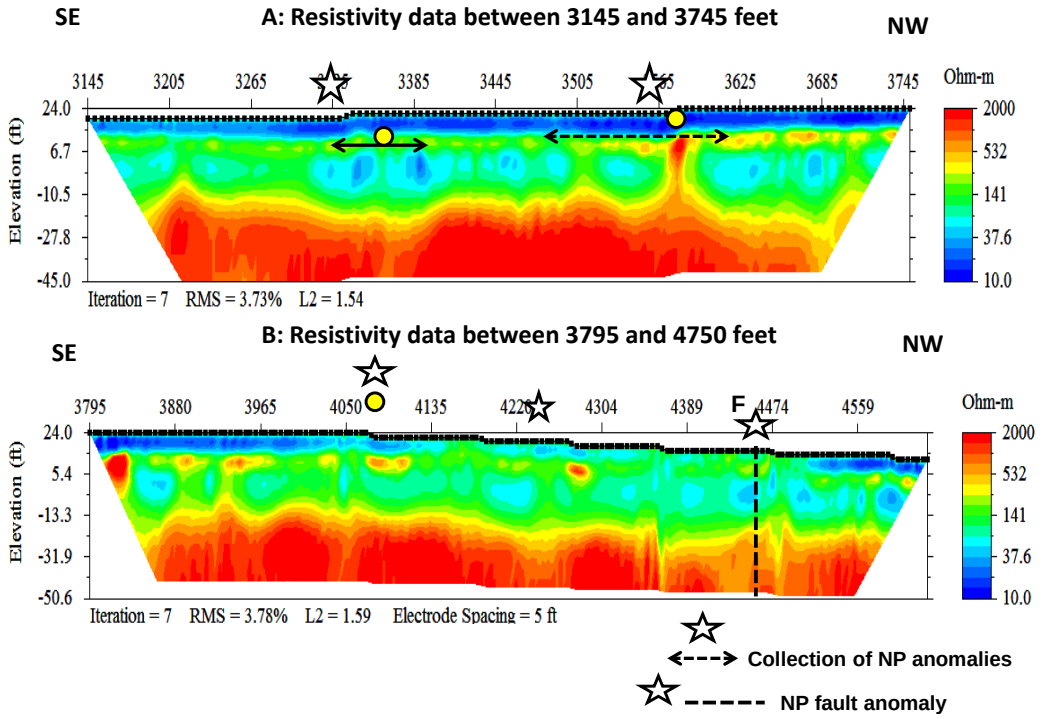


Figure 59. Correlation of resistivity and NP data between stations 3145 and 4750 feet.

Correlation of resistivity and NP anomalies is good; except the NP anomaly at station 4250 feet does not corresponds to a significant resistivity anomaly. In addition, the fault location predicted by the NP data does not indicate a fault anomaly on this resistivity section at station 4460 feet.

13.4 Resistivity Data between Sations 4355 and 6030 Feet

Correlation of resistivity and NP data collected between 4355 and 6030 feet is provided in Figure 60. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

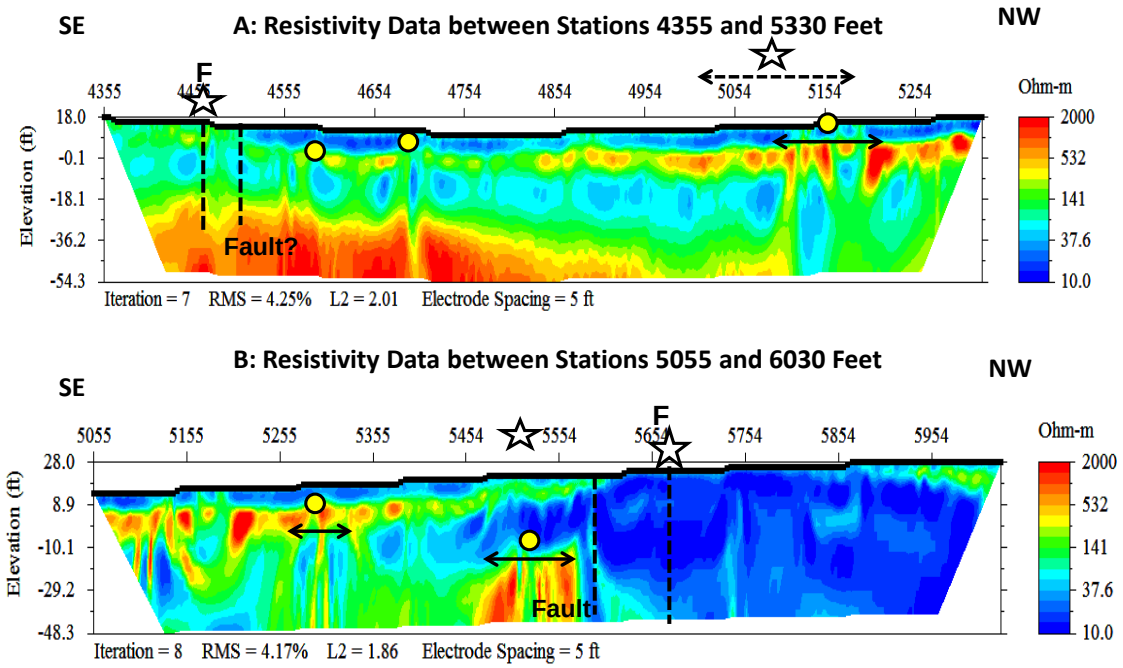


Figure 60**.** Correlation of resistivity and NP data between stations 4355 and 6030 feet**.**

Correlation of resistivity and NP data is good. Two fault locations predicted by both the resistivity and NP data differ less than 100 feet on the resistivity sections. Resistivity and NP anomalies overlap between stations 5000 and 5180 feet, and are correlative. There are three resistivity anomalies indicated at stations 4600, 4680 and 5280 feet do not correspond to any significant NP anomalies.

13.5 Resistivity Data between Stations 5755 and 7430 Feet

Correlation of resistivity and NP data collected between 4355 and 6030 feet is provided in Figure 61. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

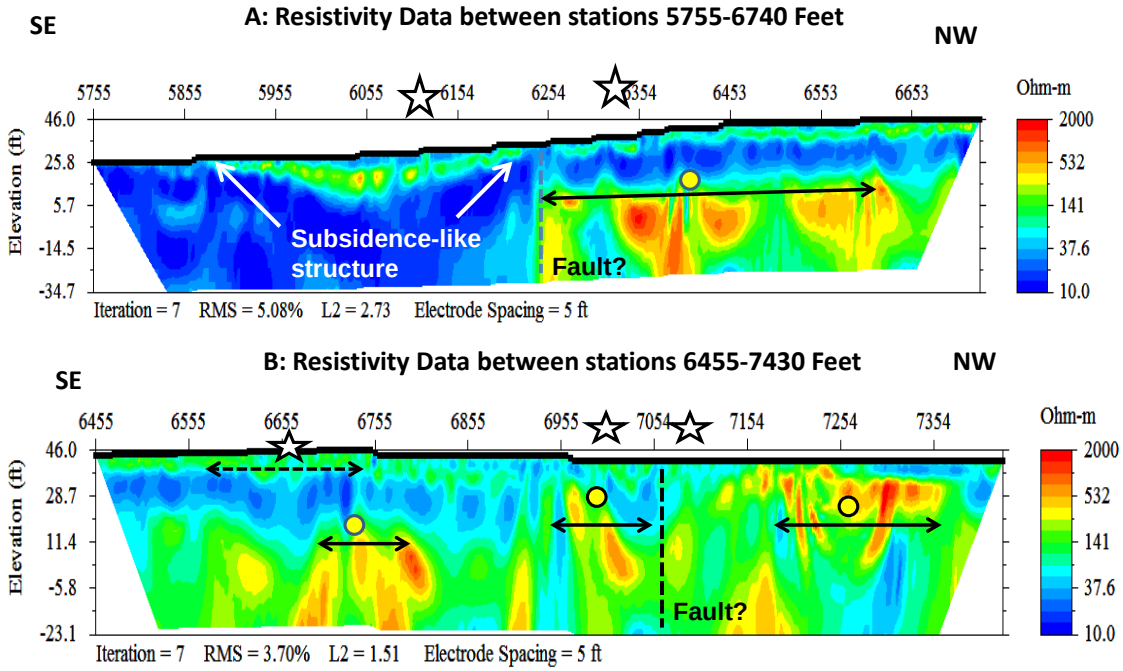


Figure 61**.** Correlation of resistivity and NP data between stations 5755 and 7430 feet**.**

A significant subsidence geometry shown by the resistivity data, between stations 5875 and 6255 feet do not correlate to any significant NP anomaly. There is only one local NP anomaly at station 6120 feet. There are two fault locations predicted by the resistivity data at stations 6250 and 7060 feet. The NP data does not indicate any fault anomaly at these stations. Resistivity anomalies observed stations 7170 and 7350 feet do not correspond to any significant NP anomalies. The rest of the resistivity anomalies match well and/or overlap with the NP anomalies.

13.6 Correlation of Resistivity and NP Data between Stations 7155 and 8840 Feet

Correlation of resistivity and NP data collected between 7155 and 8840 feet is provided in Figure 62. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

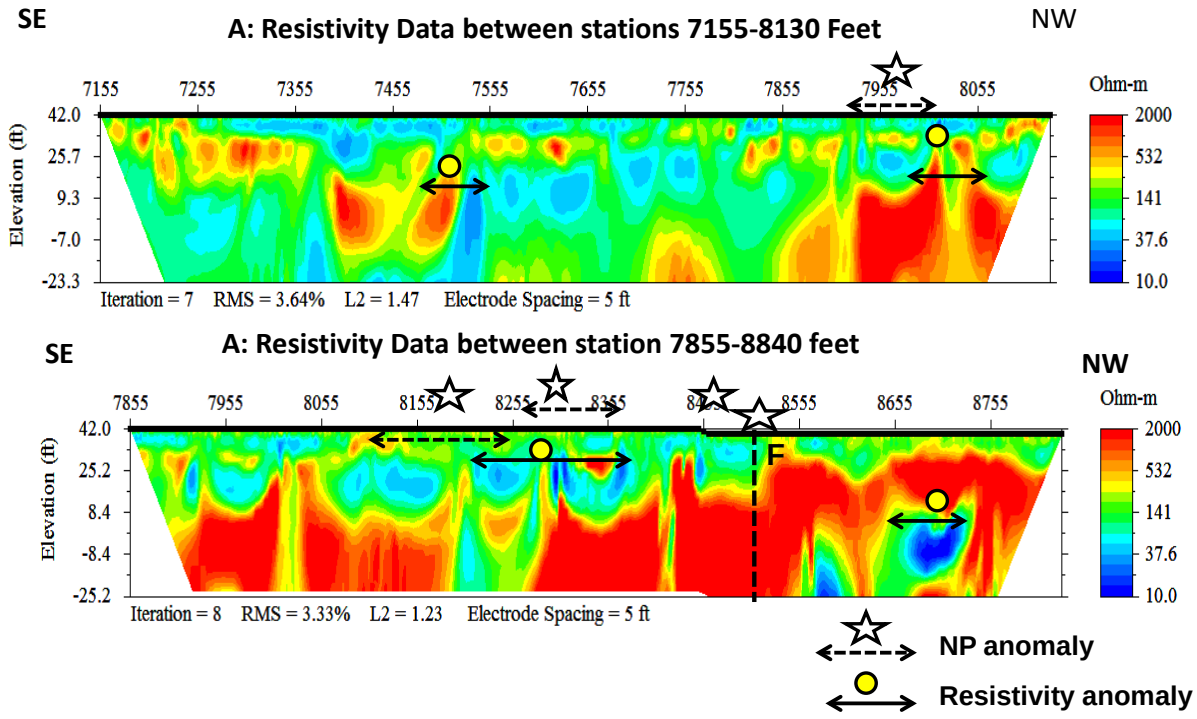


Figure 62. Correlation of resistivity and NP data between stations 7155 and 8830 feet.

The NP data suggests a fault at station 8500 feet, whereas the resistivity data does not. Two resistivity anomalies at stations 7500 and 8700 feet respectively do not correspond to any significant NP anomaly. The rest of the anomalies are correlative.

13.7 Resistivity data between Stations 8555 and 10230 Feet

Correlation of resistivity and NP data collected between 8555 and 10230 feet is provided in Figure 63. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

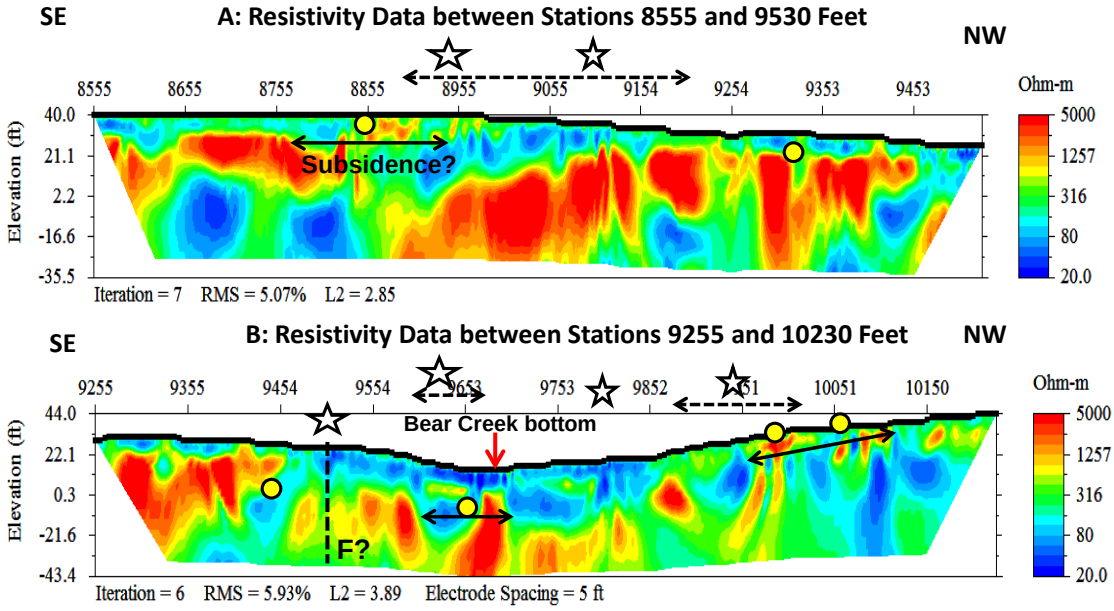


Figure 63. Correlation of resistivity and NP data between stations 8555 and 10230 feet.

The resistivity data indicates dipping layers between stations 8760 and 8940 feet where there is no NP anomaly is observed. Significant NP anomalies are observed between stations 8850 and 9200 feet. NP anomalies are also present adjacent to the southern and northern boundaries of the Bear Creek. Because there was no soil on the bottom of the creek, we could not collect NP data. The NP data also suggests a fault at about station 9520 feet whereas the resistivity data does not.

13.8 Resistivity Data on Bear Creek Bed

We conducted a resistivity survey along the Bear Creek. The survey direction was in the east-west direction and crossed the SH 45 ROW profile. The creek bed contained local areas of high elevation due to the apparent “upswelling” of the creek bed. The purpose of the survey was to decipher the apparent dome structures that were visible on the Creek bed and also locate any karstic features. Figure 64 provides only the resistivity data because we could not collect NP data on this profile due to lack of veneer soil on the top of the limestone rocks.

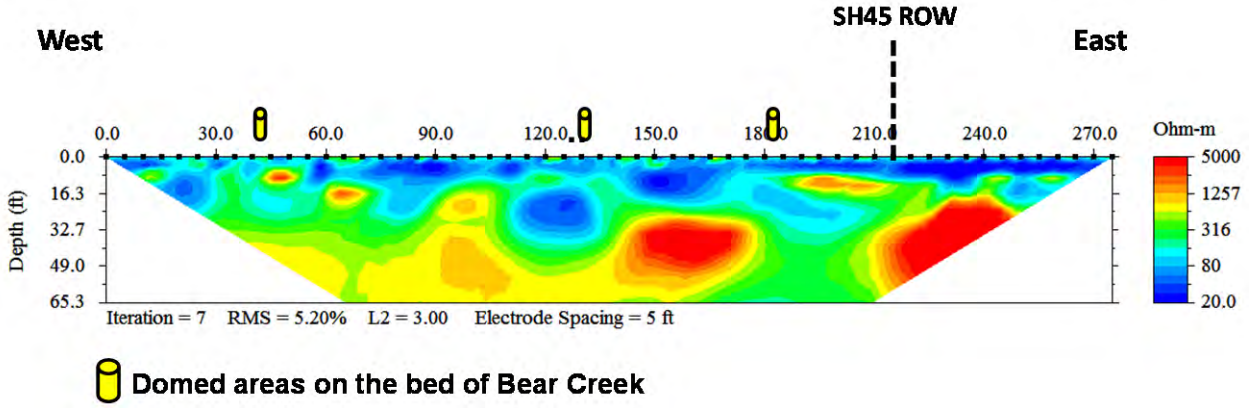


Figure 64. Resistivity profile on the beds of Bear Creek showing the data with the locations of domed areas and SH 45 ROW profile. There is no observable relation (pattern) between the "domed" areas and the distribution of the rocks with different resistivity values.

We did not observe any correlation between the location of the domed areas and the underlying distribution of the rocks.

13.9 Correlation of Resistivity and NP Data between Stations 9955 and 11560 Feet

Correlation of resistivity and NP data collected between 9955 and 11560 feet is provided in Figure 65. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

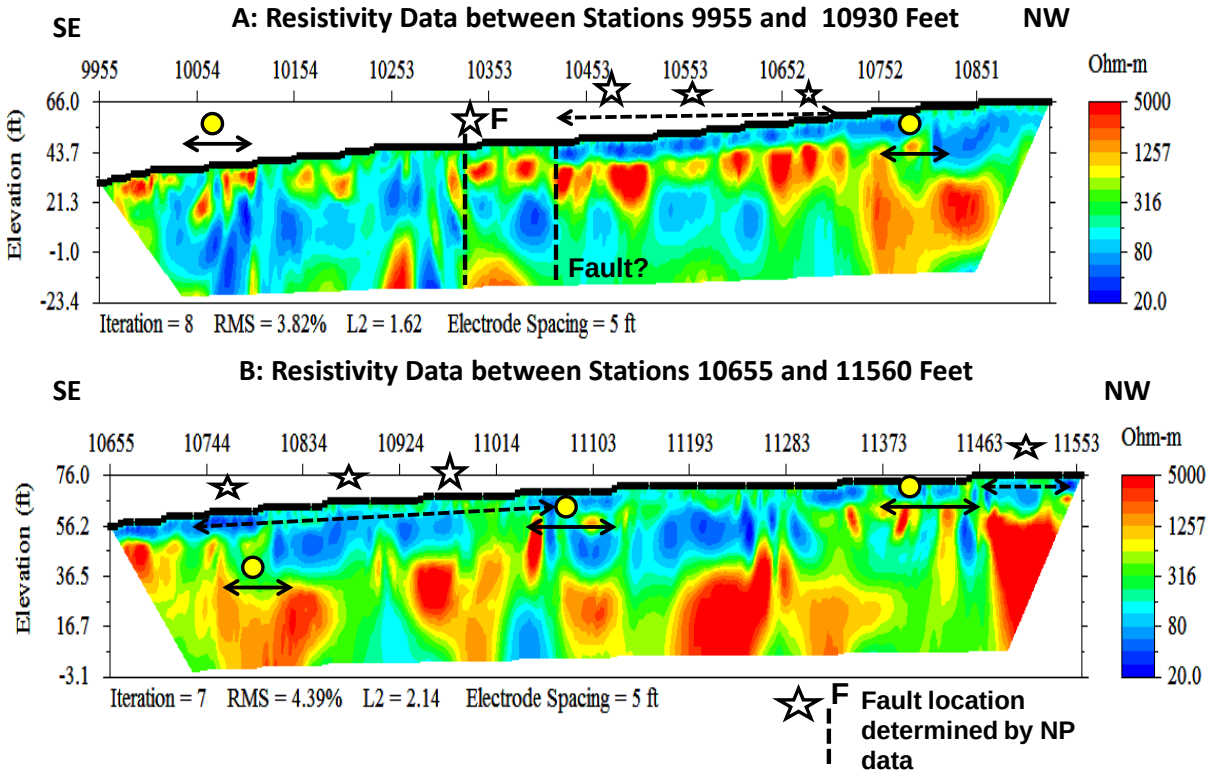


Figure 65. Correlation of resistivity and NP data between stations 9955 and 11560 feet.

The NP and resistivity data suggest a fault at station 10320 and 10420 feet, respectively. The NP low observed between stations 10400 and 10720 do not corresponds to resistivity anomalies; however, a NP high observed between stations 10720 and 11060 feet corresponds significant resistivity anomalies.

13.10 Correlation of Resistivity and NP Data between Stations 11285 and 12970 Ft

Correlation of resistivity and NP data collected between 11285 and 12970 feet is provided in Figure 66. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

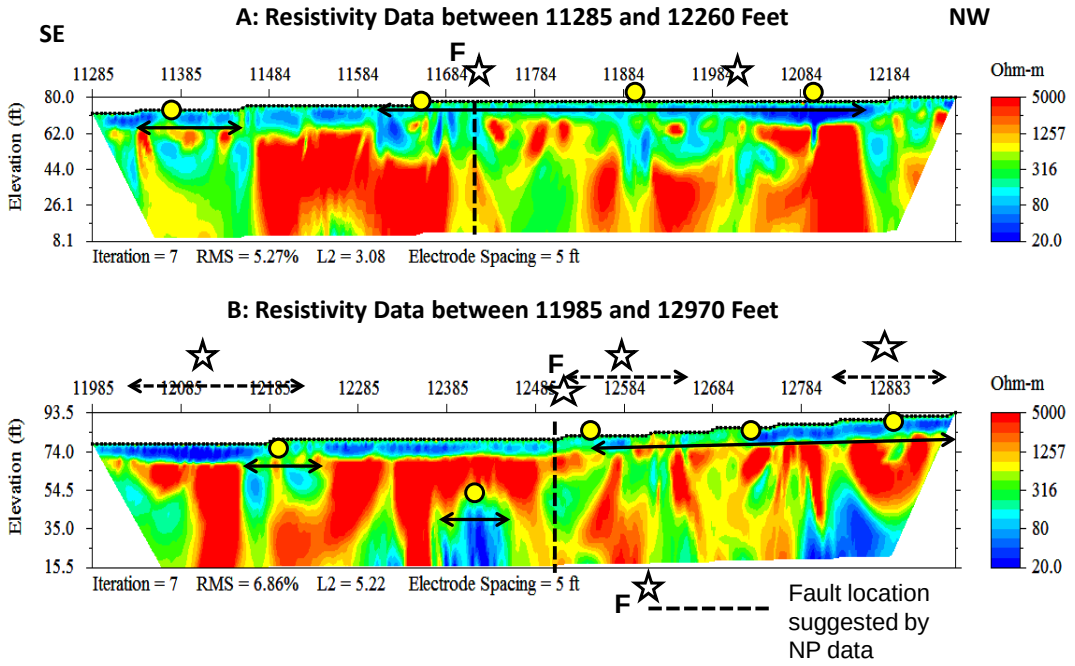
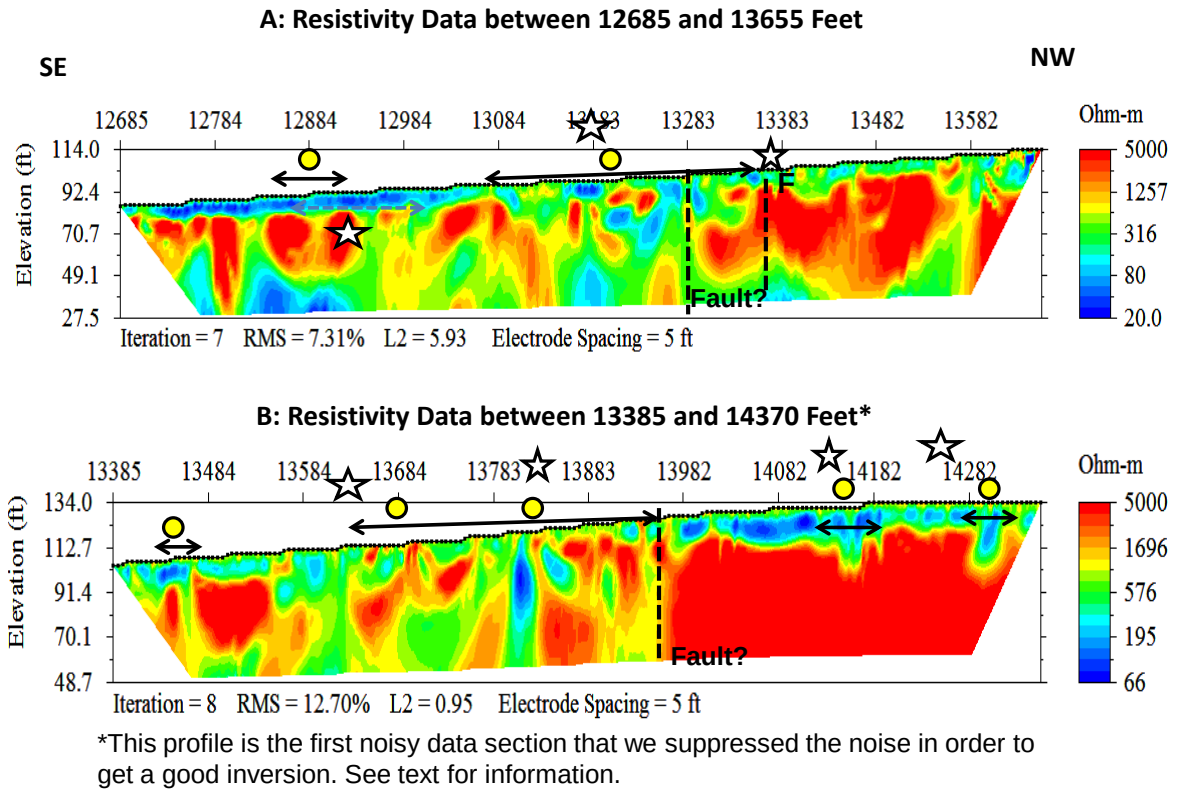


Figure 66. Correlation of resistivity and NP data between stations 11285 and 12970 feet.

The NP data suggests two faults at stations 11720 and 12500 feet, respectively. Resistivity data does not indicate the presence of these faults. However, the rest of the resistivity anomalies appear to be correlative except resistivity anomalies at stations 11385 and 12400 feet.

13.11 Correlation of Resistivity and NP Data between Stations 12685 and 14370 Ft

Correlation of resistivity and NP data collected between 112685 and 14370 feet is provided in Figure 67. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.



*This profile is the first noisy data section that we suppressed the noise in order to get a good inversion. See text for information.

Figure 67. Correlation of resistivity and NP data between stations 12685 and 14370 feet.

The NP data suggests a fault at station 13380 feet whereas the resistivity data indicates a fault at about station 13280 feet. The proximity of both suggested faults is quite correlative. Another fault is also suggested at station 13970 feet. There is no corresponding NP anomaly to this fault. Rest of the anomalies predicted by both methods correlates well.

13.12 Correlation of Resistivity and NP Data between Stations 14084 and 15770 Ft.

Correlation of resistivity and NP data collected between 14084 and 15770 feet is provided in Figure 68. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

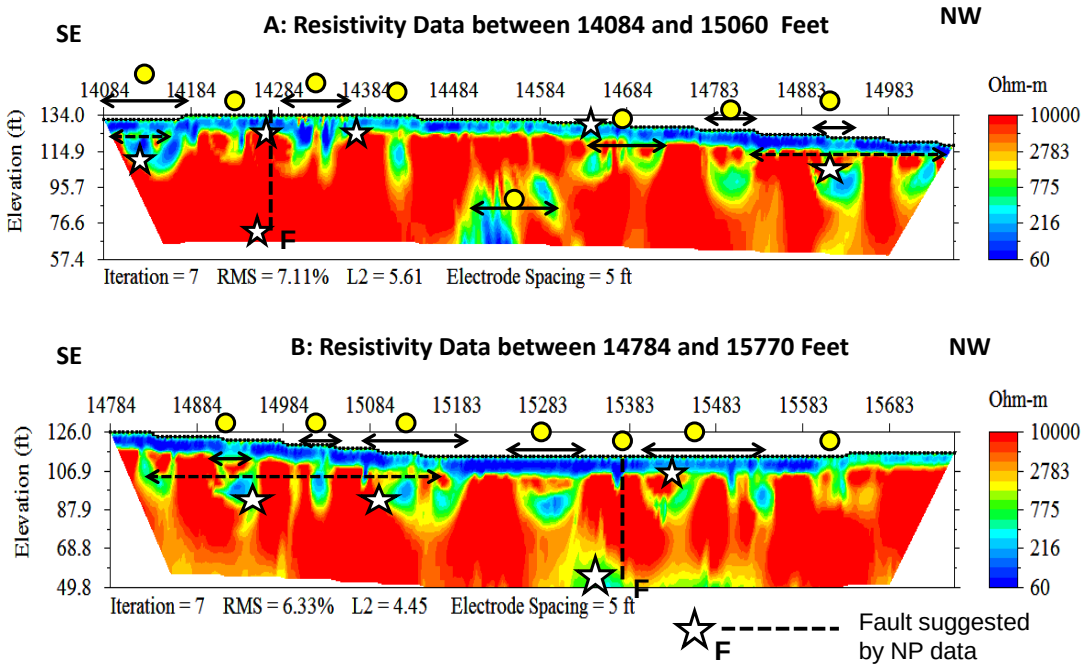


Figure 68. Correlation of resistivity and NP data between stations 14084 and 15770 feet

The NP data suggests two faults at stations 14280 and 15380 feet, respectively. However, the resistivity data does not indicate any fault at both locations. In general, NP anomalies correlate well with the resistivity anomalies.

13.13 Correlation of Resistivity and NP Data between Stations 15485 and 16530 Ft

Correlation of resistivity and NP data collected between 14084 and 15770 feet is provided in Figure 69. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

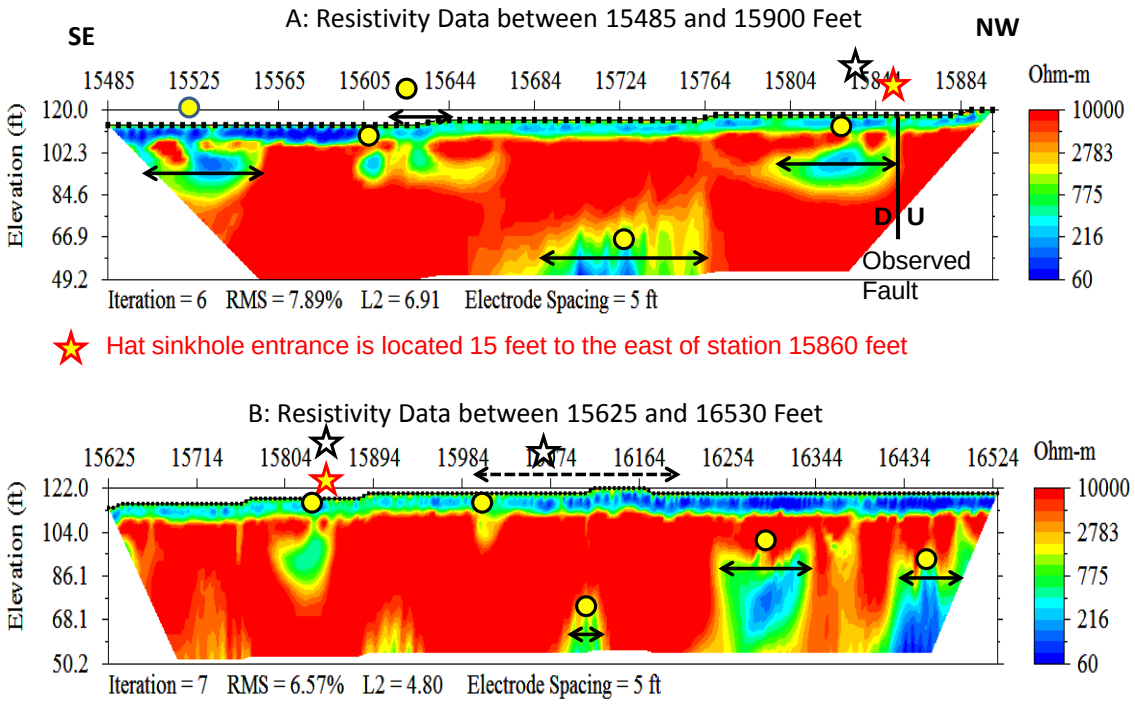


Figure 69. Correlation of resistivity and NP data between 15485 and 16530 feet.

We observed a small fault with a southeast dip at station 15855 feet. The NP data indicates this fault but the resistivity data does not. Resistivity anomalies observed on these data sets do not correlate with the NP data.

13.14 Correlation of Resistivity and NP Data between Stations 16255 and 17930 Ft

Correlation of resistivity and NP data collected between 14084 and 15770 feet is provided in Figure 70. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

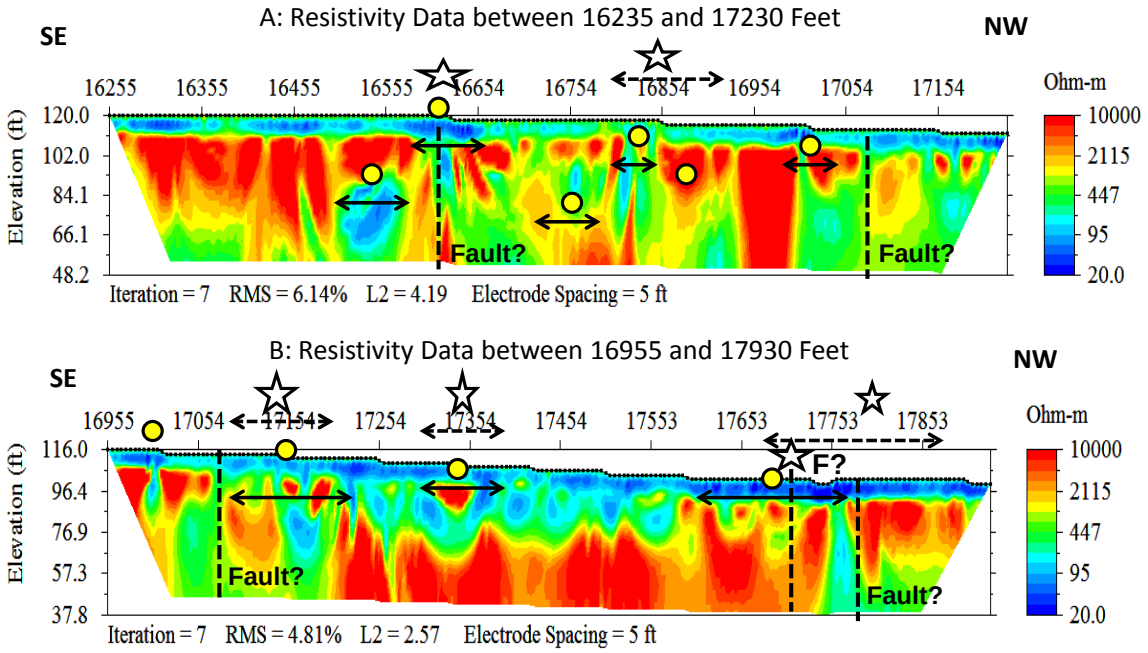


Figure 70. Correlation of resistivity and NP data between stations 16255 and 17930 feet.

Both NP and resistivity data indicate a fault at around station 16600 feet. The resistivity data indicates another fault at around station 17100 feet whereas the NP data does not. Both data sets also suggest a fault in the vicinity of station 17700 feet. The resistivity data also suggests a fault around station at 17800 feet. However, last two fault locations are very to close each other, and in between a significant high NP anomaly is located. It is probably one of two faults exists. The rest of the anomalies, in general, correlate well with few exceptions.

13.14 Resistivity Data between Stations 17655 and 18285 Feet

Correlation of resistivity and NP data collected between 17655 and 18255 feet is provided in Figure 71. Resistivity anomalies are shown with circles filled with a yellow color whereas the NP anomalies are provided with a star symbol filled with white color.

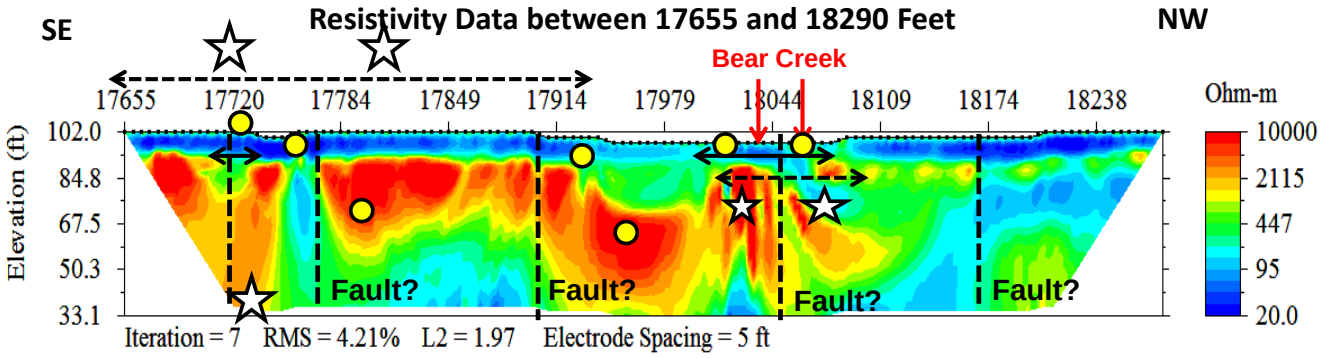


Figure 71. Correlation of resistivity and NP data between stations 17655 and 18235 feet. Note that the profile crosses Bear Creek between stations 18035 and 18070 feet.

The NP and resistivity data suggest a fault at stations 17700 and 17770 feet, respectively. The fault locations are two close. For this reason, there should be only one fault. In this case we take the location predicted by the resistivity data, which is about 17770 feet. The resistivity data also suggest three more fault locations: stations 17900, 18050 and 18170 feet, respectively. None of these faults are indicated by the NP data. However, correlation of the NP anomalies is quite correlative with the resistivity anomalies.

It is significant to note that the resistivity data on Figure 71 suggests the presence of as many as four faults.

13.15. Summary of Resistivity Data

The resistivity data collected along the SH 45 ROW indicate several karstic resistivity anomalies. Location (station distance) of these anomalies along the ROW is given below.

Profile ID	Coordinate (X-feet)	Remarks	Correlation
0-1880-Ft			
A	730	Fault?	Yes
A	749-1249		Yes
B	1400-1460		Yes
B	1400-1650		Yes

Profile ID	Coordinate (X-feet)	Remarks*	Correlation
1610-1309-Ft			
A	2530		Yes
B	2500-2700		Yes

*Anomalies on these profiles are probably due to voids filled with clays and/or weathered, fragmented limestone which are called "soil pipes" in karst literature. This type of anomalies is very prevalent along the ROW.

Profile ID	Coordinate (X-feet)	Remarks	Correlation
3145-4750-Ft			
A	3340-3390		Yes
A	3365-3580		Yes
B	4080		Yes

Profile ID	Coordinate (X-feet)	Remarks	Correlation
4355-6030-Ft			
A	4500	Fault?	Yes
A	4600		No
A	4700		No
A	5100-5200		Yes
B	5260-5300		No
B	5470-5560		Yes
B	5600	Fault?	Yes

Profile ID	Coordinate (X-feet)	Remarks	Correlation
5755-7430-Ft			
A	5875-6240	Subsidence	No
A	6250	Fault?	No
A	6250-6600		No
B	6700-6800		Yes
B	6955-7025		Yes
B	7060	Fault?	No
B	7170-7350		No

Profile ID	Coordinate (X-feet)	Remarks	Correlation
7155-8830-Ft			
A	7470-7540		No
A	8010-8040		Yes
B	8230-8365		Yes
B	8665-8740		No

Profile ID	Coordinate (X-feet)	Remarks	Correlation
8555-10230-Ft			
A	8760-8940	Subsidence?	No
A	9325		No
B	9445		No
B	9620-9720	Creek	Yes
B	9950-10100		Yes

Profile ID	Coordinate (X-feet)	Remarks	Correlation
9955-11560-Ft			
A	10030-10110		No
A	10755-10815		Yes
A	10410	Fault?	Yes
B	11050-11110		Yes
B	11370-11460		No

Profile ID	Coordinate (X-feet)	Remarks*	Correlation
11285-12970-Ft			
A	11350-11450		No
A	11600-12160		Yes
B	12140-12250		Yes
B	12370-12460		No
B	12560-12910		Yes

Profile ID	Coordinate (X-feet)	Remarks	Correlation
12685-14370-Ft			
A	12840-12915		Yes
A	13070-13200		Yes
A	13280	Fault?	Yes
B	13430-13475		No
B	13600-13950		Yes
B	13950	Fault?	No
B	14115-14190		Yes
B	14275-14320		Yes

Profile ID	Coordinate (X-feet)	Remarks	Correlation
14084-15770-Ft			
A	14084-14185		No
A	14240		No
A	14290-14365		Yes
A	14410		No
A	14490-14585		No
A	14640-14715		Yes
A	14745-14820		No
A	14880-14945		Yes
B	14900-14950		Yes
B	15000-15035		Yes
B	15070-15185		Yes
B	15245-15325		No
B	15370		No
B	15400-15575		No
B	15625		No

Profile ID	Coordinate (X-feet)	Remarks	Correlation
15485-16530-Ft			
A	15500-15555		No
A	15610		No
A	15615-15635		No
A	15690-15760		No
A	15790-15855		No
A	15855	Observed fault	Yes
B	16005		Yes
B	16230-16340		No
B	16450		No

Profile ID	Coordinate (X-feet)	Remarks*	Correlation
16255-17930-Ft			
A	16500-16575		No
A	16600-16650		Yes
A	16620	Fault?	Yes
A	16715-16790		No
A	16895		Yes
A	17000-17060		No
B	17010		No
B	17080	Fault?	No
B	17080-17250		Yes
B	17300-17380		Yes
B	17610-17800		Yes
B	17800	Fault?	Yes

Profile ID	Coordinate (X-feet)	Remarks*	Correlation
17655-18285-Ft			
A	17700-17740		Yes
A	17760	Fault?	Yes
A	17800		Yes
A	17905	Fault?	No
A	18000-18085		Yes
A	18050	Fault?	**
A	18170	Fault?	***

There is not enough NP data to interpret whether the NP data correlates with the both faults predicted by the resistivity data.

In summary, 50 NP anomalies are correlated with the resistivity data, whereas 39 resistivity anomalies did not correlative with the NP data.

14.0 Correlation of Geophysical Data with Known Faults

The resistivity and NP data predict eleven and fourteen faults, respectively. Seven of these faults are indicated, and correlated by both the resistivity and NP data.

Profile ID	Resistivity (X-Ft)	NP (X-Ft)	Correlation
0-1880-Ft	730	730	Yes
4355-6030	4500	4460	Yes
4355-6030	5000	5060	Yes
5755-7430	6250	N/A	No
5755-7060	7060	N/A	No
7155-8830	N/A	8500	No
8855-10930	N/A	9520	No
9955-10930	10430	10320	Yes
11285-12970	N/A	11720	No
11285-12970	N/A	12500	No
12685-14370	13280	13380	Yes
12685-14370	13950	N/A	No
14084-15770	N/A	14280	No
14084-15770	N/A	15380	No
15485-16530	N/A	15855	No
16255-17930	16600	16600	Yes
16255-17930	17100	N/A	No
17655-18290	17760	17700	Yes

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A REPORT ON THE REPROCESSING AND INTERPRETATION OF STATE HIGHWAY 45 RIGHT OF WAY ELECTRICAL RESISTIVITY SURVEY DATA

CSJs: 1200-06-004 and 1200-06-001

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December 8, 2014

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A Report on the Reprocessing and Interpretation of SH45 ROW Electrical Resistivity Survey Data

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December 8, 2014

Executive Summary

Electrical resistivity profiling data acquired by Environmental Geophysical Associates (EGA) along the SH 45 ROW centerline were initially acquired in mixed array format – a format composed of two industry standard electrode arrays, the Dipole-Dipole (DD) and the Inverse Schlumberger (IS) arrays. Mixed arrays do have specific uses and have shown potential for increasing electrical resistivity resolution at depth for some applications. However, it was the opinion of this author that use of the mixed array method contributed to artificial resistivity features (artifacts) in the final processed resistivity profiles. All raw profiles were then reprocessed by this author to remove the data associated with the IS array. The subsequent data files containing the DD array data only were then inversion modeled to produce a new set of resistivity profiles. These profiles were then appended and formatted to create a continuous profile display along the SH45 ROW (Plate 1).

Background

The concept of arrays in electrical resistivity imaging, the geophysical method employed in the SH45 ROW karst study, simply relates to the physical arrangement of the 4 electrodes (2 current injection and 2 voltage measurement electrodes) that comprise the method for measuring subsurface resistivity (Figure 1). The DD array type is the industry standard array and has been shown to provide good results for most geologic situations. The DD array also provides excellent horizontal resolution of resistivity changes, with somewhat less resolution in the vertical direction. Other array types, such as the IS array, have more specialized application for some geologic conditions. In particular the IS array is noted for excellent vertical resolution. The idea of collecting resistivity data in a mixed-array format is based on the premise that the deficiencies of one method are compensated for by the other. However, problems may arise in the processing of mixed-array data, specifically the inversion modeling of the raw data to produce the final profiles. Depending on the vertical and horizontal heterogeneity in the subsurface

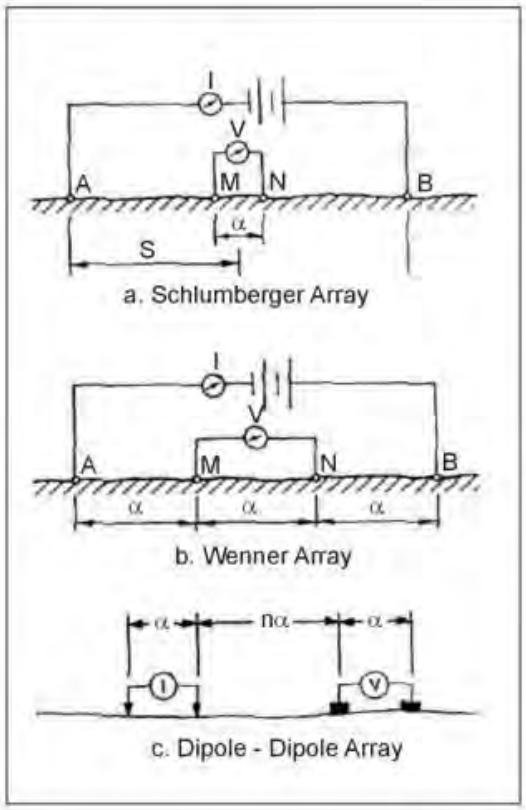

Figure 1. Example of 3 common resistivity array electrode configurations.

geologic environment, the modeling of the subsurface resistivity structure (using the mixed array data) may introduce artificial results (known as inversion artifacts) that cannot be substantiated by the known geologic conditions.

This author's review of the results produced by the processing of the mixed array datasets by EGA concluded that two specific artifacts were being introduced into the data by the inversion modeling. The most noticeable artifact was a consistent low resistivity layer from the surface to about 8 ft (~ 2.5 meters) in depth, seen in most of the profiles. This layer was interpreted by EGA as being associated with the surface soil layer – a common interpretation of the resistivity response of soil in the regional environment. However, soil depths along the ROW varied significantly in depth, from 0 (eg. exposed bedrock) to at most 3-5 ft. The second pervasive artifact in the mixed array datasets was an apparent exaggeration of high resistivity anomalies in the vertical dimension. The appearance of these artifacts is best described as a "smearing" of the anomaly vertically toward the depth limits of the profiles. Figure 2 shows both of these effects.

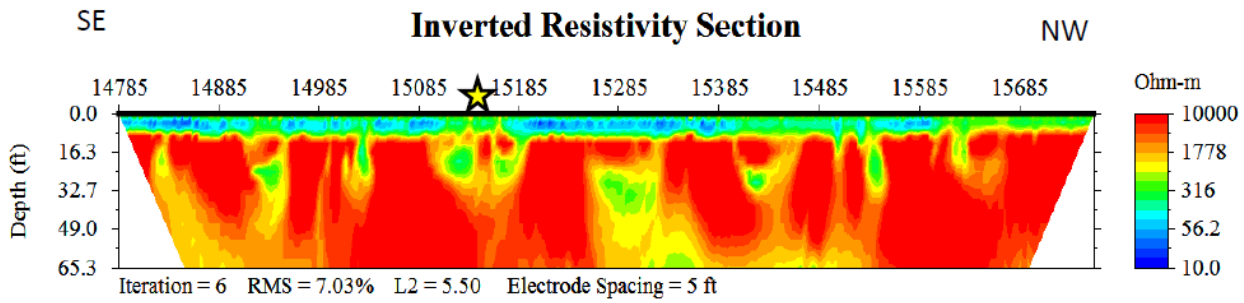

Figure 2. Inverted results from resistivity line 23-South, acquired on April 17, 2014. Note the consistent low resistivity layer at the surface and the vertical "smearing" of high resistivity features downward.

To test the effects of reprocessing after removal of the IS array component, significantly improved results were seen (Figure 3).

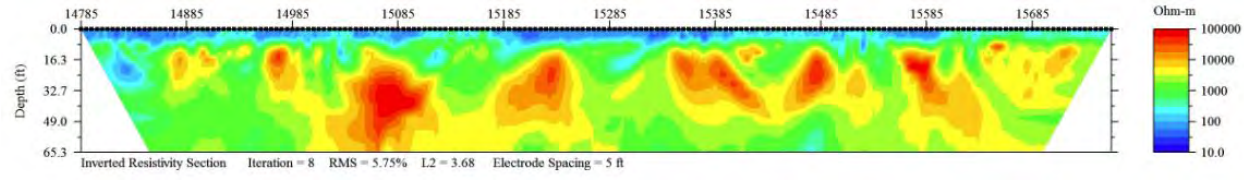

Figure 3. Inverted results from reprocessing of DD array only. Note the more realistic surface soil layer as the low resistivity zone, and the more constrained high resistivity features interpreted as karst void development.

Methods and Results

The method by which all raw data files (in .stg file format) were stripped of the IS array data component involved manually parsing through the data to look for the command addresses that signified the end of the DD raw data and the beginning of the IS raw data. This was done for each roll-along acquisition that made up the entirety of the collected profiles each day of the survey – most daily profiles consisted of 10 appended acquisitions or roll-alongs. The data were reformatted then to include only the DD array acquired data. These data were subsequently reprocessed (eg. inversion modeled) in the EarthImager software application using both smooth model and robust model inversion methods. All inverted profiles were then set to a consistent logarithmic display scale ranging from 10 to 100,000 ohm-meters.

The final step in this reprocessing effort was the appending of all profiles into a near continuous profile graphic, completed in a Powerpoint slide presentation. The profile was annotated with locations of mapped features from the surface karst survey as well as locations of this author's interpreted features such as likely faults, sinkholes, and karst voids.

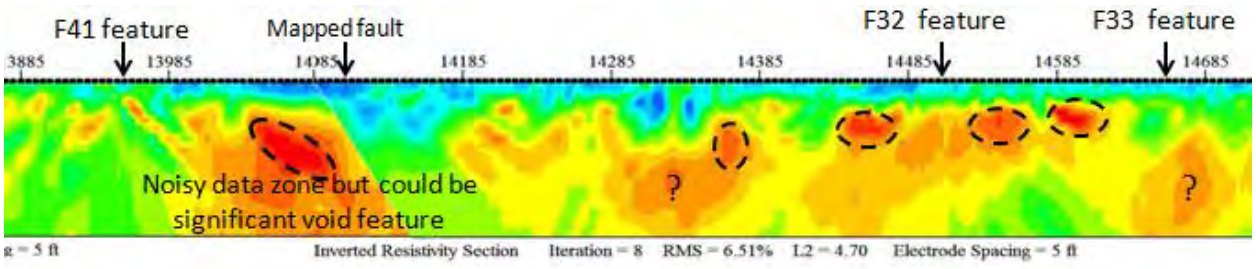

Figure 4. Example of annotated interpretation of reprocessed resistivity profile data.

Conclusion

The results of the reprocessing and re-interpretation of the SH45 resistivity datasets showed significant improvement with far fewer artifacts in the modeled output. These results, in this author's opinion, are much more consistent with the observed geologic environment and situation along the ROW, as assessed from published maps of the surface geology as well as the results of karst feature surveys and excavations.

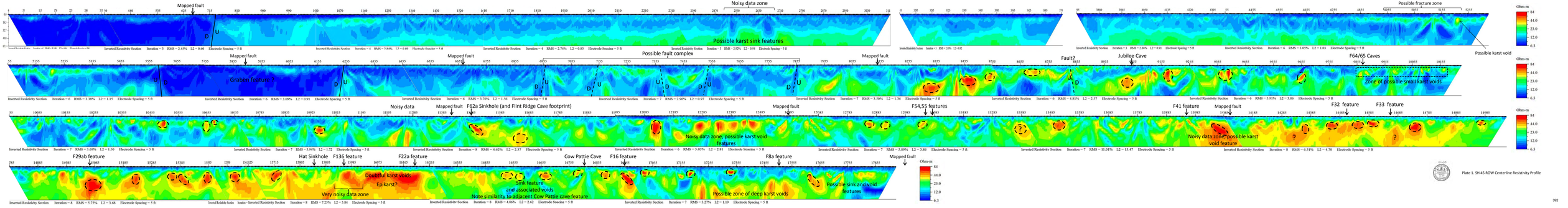

Plate 1. SH 45 ROW Centerline Resistivity Profile